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Strategies to Increase Competitive Advantage in the Automotive Manufacturing Supply Chain

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This is to certify that the doctoral study by

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Walden University
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Abstract

Some automotive manufacturing supply chain leaders lack strategies that are needed to implement information technology (IT) systems. Business leaders are concerned with implementing IT systems to achieve and maintain a competitive advantage. Grounded in the resource-based view theory (RBV), the purpose of this qualitative single case study was to explore information system strategies used by leaders in the automotive manufacturing supply chain to achieve competitive advantage. Participants were five leaders of an automotive manufacturing supply chain organization who implemented IT systems. Data were collected through semistructured interviews and a review of organization project documents. Through thematic analysis, five themes were identified: building supplier partnerships, implementation of technology systems, implementing innovative practices, and information sharing. A key recommendation is for business leaders to determine their organizations' financial and human capacity to implement new technology systems. Implications for positive social change include the potential to provide employment opportunities within organizations that help to strengthen communities.

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Dedication

I dedicate this study to my father Kevin R. Willis who never saw this adventure and my mother Renee M. King who I lost during the journey. Thank you for teaching me the value of hard work, dedication, and perseverance, and for always encouraging me to strive for excellence.

Your love and sacrifice have allowed me to become everything I am today and everything I will be come tomorrow. I hope I have made you proud. May you both continue to rest in peace. I also dedicate this study to my daughter Ava K. Willis who is the fuel behind my success and the inspiration behind my endeavors. Thank you for being the push I needed to cross the finish line. May you continue to be a strong, independent, and fearless leader. Remember to live a life you're proud of by achieving success on your own terms. I love you to the moon and back.

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Section 1: Foundation of the Study

In today's global economy, developing strategies that are both innovative and agile is necessary to create sustainable business practices and enhance organizational competitiveness (Nguyen & Hoang, 2022). Agility is a business skill that involves adopting organization strategies, information technology (IT), and logistical processes (Swafford et al., 2008). In literature regarding supply chain management and competitive advantage over the last two decades, there is an abundance of information regarding strategies needed to achieve and sustain competitive advantage while meeting demands of customers. For organizations to maintain sustainability, they must be innovative in highly competitive markets (Koster et al., 2017). By exploring successful strategies for implementing IT systems to improve responsiveness in terms of customer demand, automotive manufacturing supply chain leaders may increase their ability to gain competitive advantage.

Background of the Problem

Managing supply chains requires a significant amount of communication, both internally and externally. Information systems that transmit business data from one computer to another allow for closer relationships between customers and suppliers (Sriram et al., 2000). Communication between suppliers fosters partnerships that involve sharing of information between organizations within supply chain networks (Velda & Dhiba, 2017). For information sharing to be effective, IT is needed (Kremljak & Kafol, 2015). Information sharing through IT improves manufacturing organizations' competitive advantage and responsiveness to changing markets by increasing methods of

communications between agents involved in purchasing planning, scheduling, logistics, and quality (Kremljak & Kafol, 2015).

Implementation of IT systems and sharing information alone cannot assist organizational leaders in achieving a competitive advantage. Additional strategies that include operational integration of multiple tiers of suppliers are needed to have an impact on competitive advantage (Vanpoucke et al., 2017). Integration of multiple tiers requires allocation of both human and financial resources and investment in more innovative IT systems (Bilgihan & Wang, 2016). In this qualitative case study, I explored strategies used by leaders at automotive manufacturing supply chain companies to implement information systems needed to achieve a competitive advantage.

Problem Statement

Organizational leaders who fail to implement IT to help improve supply chain and logistics practices by increasing efficiency are unable to influence organizations' abilities to achieve a competitive advantage (Gunasekaran et al., 2017). To reduce transaction time and administrative costs associated with supply chain management, supply chain companies will invest $232 billion in digitization by 2025 needed to implement innovative supply chain technology, compared to $12.4 billion in 2020 (Chang et al., 2019). The general business problem was that some leaders in the automotive supply chain industry fail to implement successful IT systems, which results in a decrease in competitive advantage. The specific business problem was that some leaders in the automotive supply chain lack automotive supply chain information system implementation strategies to achieve competitive advantage.

Purpose Statement

The purpose of this single qualitative case study was to explore information system strategies used by leaders in the automotive manufacturing supply chain to achieve competitive advantage. The targeted population consisted of leaders from one automotive manufacturing supply chain company located in North America with a global presence who have achieved competitive advantage through the implementation of information systems. This study will lead to positive social change by identifying strategies for sustainable competitive advantage and offering supply chain management processes that improve costs and operating efficiency, which can help organizations provide sustainable employment opportunities for their communities.

Nature of the Study

The qualitative research method was chosen for this study due to the descriptive and exploratory nature of the research question. Qualitative research methods are used to facilitate collection of detailed information from multiple participants (Simba et al., 2017). Quantitative research involves uses a hypothesis testing approach to examine variable correlations or group differences (Lyall & King, 2016). As I was not interested in testing a hypothesis to understand correlations or differences among variables or groups, the quantitative research method was inappropriate. Likewise, the mixed methods approach was also not appropriate. Mixed methods are typically adopted to support the shortcomings of either quantitative or qualitative research methods and examine and explore various perspectives through multiple research techniques to understand complex phenomena (Tu, 2018). The mixed methods approach takes additional time to complete

which would not have been possible due to the time limitations set by the research organizations, all necessary information may not have been obtained. Mixed methods also requires implementation of a quantitative component, which was outside the scope of my doctoral study.

A single qualitative case study design was used to identify data in my doctoral study. A single case study involves conducting an in-depth analyses of an individual or group (Korstjens & Moser, 2017). Other designs used for qualitative research include narrative, ethnography, and phenomenology. These other methods were not appropriate for this study. The narrative design involves participants' stories regarding phenomenon, ethnography involves exploring meanings and behaviors related to a specific group of people, and phenomenologists explore how individuals understand phenomena and detailed accounts of their personal experiences (Korstjens & Moser, 2017). Since none of these designs were appropriate as they were outside of the scope of my study to explore and identify the research question, I chose the qualitative single case design.

Research Question

The research question for this study was: What strategies do automotive manufacturing supply chain leaders use to integrate information systems to achieve a competitive advantage?

Interview Questions

To gain a comprehensive understanding of strategies used by automotive manufacturing supply chain leaders to integrate information systems and achieve competitive advantage, I asked the following questions:

1. How do you define your global supply chain and identify where information systems add the most value?
2. What strategies and processes does your organization use to evaluate and select information to create a competitive advantage?
3. What aspects of the supply chain processes do your strategies and processes prioritize for integration of information systems?
4. What processes are in place to achieve and sustain integration of new information systems?
5. Based upon your organization's experiences, how does integration of information systems drive competitive advantage at your firm?
6. What were the key challenges to implementing your organization's strategies for information system adoption?
7. What resources do you deploy across your supply chain to enable information systems you use?
8. What additional information would you like to share that will help improve understanding of strategies used by automotive manufacturing supply chain leaders to integrate information systems and achieve competitive advantage?

Conceptual Framework

The conceptual framework that was used in my doctoral study is the resource-based view (RBV) theory. The RBV theory involves evaluating an organization's internal resources that can be used to assist them in achieving competitive advantage. These resources include processes, assets, knowledge, equipment, capabilities, and access to

raw materials. (Barney, 1991). Understanding the value of these resources can help organizational leaders determine their firm's ability to implement strategies to improve their performance. Barney (1991) asserted organizations need unique resources like innovative IT that competitors lacked to gain a competitive advantage. Skills and capabilities of individuals within organizations can also be used as important resources that increase their competitiveness (Barney, 1991). Both physical and human resources are needed to improve organizations' competitive advantage.

Resources can only be of value to organizations if they are used to their full potential. Ruivo et al. (2016) showed implementing innovative information systems can help to improve supply chain management performance. Performance of a supply chain can be improved by making business process more efficient and coordination between suppliers more effective (Ruvio et al., 2016). As it relates to this study, the RBV is a conceptual framework that is used to determine how resources such as information systems can enable organizations to achieve and sustain competitive advantages.

Operational Definitions

Electronic data interchange (EDI): A form of electronic communication used to transmit business transactions between two IT systems (Vrbová et al., 2018).

Green innovation performance: Innovative technology that is used to create products or processes needed for energy-saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management in order to improve performance and management of environmental protection strategies (Chen et al., 2006).

Relationship Learning: Process to proactively improve behavior in a future relationship (Leal-Millán et al., 2016).

Supply chain integration: Standardization and alignment of IT strategies to improve business efficiency (Maitra & Dominic, 2016).

Supply chain management: Planning, sourcing, and integration of logistical processes between suppliers and customers (LeMay et al., 2017).

Supply chain network: Group of integrated suppliers who together meet various demands of shared customers (Ardalan et al., 2016).

Assumptions, Limitations, and Delimitations

Assumptions

An assumption is something that is not supported by evidence but is perceived to be true (Schoenung & Dikova, 2016). Assumptions of researchers can impact how research is initiated (Kirkwood & Price, 2013). I assumed that I would be able to gather all necessary information through interviews and archival company documentation. I assumed participants I chose to interview provided honest feedback. I assumed that the participating organization would be able to provide me with documentation that supports my doctoral study topic. I assumed data was sufficient to provide necessary triangulation. I also assumed that this data would further my discussion on strategies used by automotive manufacturing supply chain leaders to increase competitive advantage.

Limitations

A limitation is a factor that can potentially invalidate doctoral work (Ellis & Levy, 2009). A limitation that was present in this study was lack of qualified participants.

Having a limited number of participants minimized the reliability and validity of this study. Participants had limited knowledge about my topic as their role only focused on one aspect of the business, and not the breadth of the strategies used across the organization. Participants availability to participate in the initial interview and any necessary follow-up sessions was limited due to capacity constraints within their organization. Another limitation involved my ability to gain access to confidential company information and documentation as the leaders of the organization was apprehensive on sharing this information with someone who was not a current employee. Without the necessary documentation, data triangulation was limited, as multiple sources are needed to achieve triangulation. Lastly, lack of generalizability of data was also a limitation, as this study focuses on the results from one automotive manufacturing supply chain organization, whereas if employees from additional organizations would have been interviewed, a broader set of data would have been available to analyze, possibly providing varying perspectives.

Delimitations

Delimitations are boundaries that researchers set within their study that are pertinent to collection of data (Ellis & Levy, 2009). This single case study involved one global automotive manufacturing company. This automotive manufacturing company was located in the U.S. I only interviewed individuals who minimally held supervisory positions and had experience involving implementation of new processes and strategies to achieve competitive advantages within their organizations. I interviewed five participants to achieve data saturation.

Significance of the Study

My doctoral study is necessary to provide a qualitative understanding of strategies used by automotive manufacturing supply chain leaders to integrate information systems and achieve competitive advantages. These strategies may have a positive impact on business practices in similar business settings. These strategies also have a positive impact on social change if used by supply chain leaders to create sustainable employment opportunities.

Contribution to Business Practice

Findings from my doctoral study may be of potential value to business practice through identification of strategies that help to improve competitive advantage with implementation of IT systems. Competitive advantage is achieved by improving services to customers, lowering operational costs, and increasing partnerships with other suppliers (Chinomona & Omoruyi, 2016). Supply chain leaders can use findings of this study to assist in decision making and developing strategic plans that may help to identify and focus resources to improve competitive advantage. This study may also contribute to business practice by providing guidelines on how to identify, implement, and use resources that are needed to achieve competitive advantage.

Implications for Social Change

Results of this study may contribute to positive social change by identifying strategies leaders can use to improve supply chain management processes that are needed to achieve competitive advantage. By researching supply chain management practices, supply chain leaders create a better understanding of supply chain social responsibility

initiatives that are needed to address issues and challenges in communities in which they operate (Tripathy et al., 2016). Improving supply chain efficiency assists organizational leaders in terms of creating sustainable employment opportunities that are beneficial to communities. Leaders are also able to improve customer relationships with local suppliers, which helps them to create more sustainable businesses. Local businesses can help to increase employment opportunities and receive government support through financing, tax rebates, and local business collaborations (Sirilertsuwan et al., 2018).

A Review of the Professional and Academic Literature

This literature review includes an examination of current research and framework to support my doctoral study. The focus of my doctoral study is strategies used by automotive manufacturing supply chain leaders to increase competitive advantage. Themes that are discussed in this literature review include: IT, supply chain management, competitive advantage, sustainability, innovation, and social responsibility. The RBV supports these themes by outlining what resources are needed for organizations to gain competitive advantage. This study includes a review of 116 peer-reviewed articles that were retrieved through the following Walden University Library databases: Thoreau, Google Scholar, SAGE Journals, ProQuest Central, ScienceDirect, and Emerald Insight. Search keywords were: *supply chain*, *automotive*, *information technology*, *competitive advantage, innovations, firm performance, supply chain network, information sharing, partnership, implementation, integration, resource-based view theory, resources, strategies, supply chain leaders, efficiency, suppliers, and risk*. Ninety-four percent of

these articles were published between 2019 and 2023, and 6% were published prior to 2019.

IT

There are many tools businesses can use to improve performance. One tool that has assisted many organizations with expanding their business capabilities is implementation of IT systems. IT systems enhance business value and help maintain market relevance (Riera & Iljima, 2019). Implementing IT systems can increase business value by improving performance. IT systems promote adaptability, agility, and alignment within organizations (Gunasekaran et al., 2017). The effectiveness of an organization's performance in terms of these three factors can lead to achievement of business objectives. Manufacturing companies use IT systems to create more efficient supply chains (Charoensiriwath & Sangkiettiyut, 2010).

The efficiency of supply chains can help to improve lead times and communications within supply chain networks. Sharing information between manufacturers and suppliers through information systems can significantly increase the benefits of effective supply chains (Kremljak & Kafol, 2015). When firms decide to digitize their supply chain, there are many uncertainties due to the rapid change in technologies and the amount of time, money, and effort it takes for implementation (López-Morales et al., 2022). Another part of the adoption process is determining which system is best for the organization. EDI is one of the IT systems that can enable supply chain effectiveness.

Electronic Data Interchange (EDI)

Both manufacturers and suppliers can benefit from effective information exchange to enhance business communications. EDI is an IT supply chain management software system that is used for information sharing between suppliers within supply chain networks (Hwang & Lee, 2016). Supply chain networks can use EDI systems to communicate between suppliers. Supply chain networks are made of multiple tiers of suppliers who provide components to the original equipment manufacturer (OEM; Thomé et al., 2014). EDI involves transmitting business data from one computer to another through high-speed communication (Sriram et al., 2000).

Transfer of data from one entity to another allows for closer relationships between customers and suppliers by allowing both to communicate in real time between each other about products and services (Sriram et al., 2000). Benefits of the EDI system include reduction in human errors when implementing data, reduction in the amount of time needed to transport data, reduction in lead and cycle time, and a reduction of costs to process orders (Marsaud, 1993). EDI is used to connect automotive suppliers within a supply chain network of like organizations, allowing them to share information and build closer relationships by sharing data on business transactions, customers, and suppliers.

Drastic changes in inventory can either cause organizations to be backordered with significant delays or have an abundance of inventory on hand for a prolonged period of time. EDI helps to improve inventory control, reduce costs, and increase customer satisfaction (Sriram et al., 2000). Improvements to business transactions via an EDI system may help to increase efficiency by improving accuracy through automated

processes, as less time is spent processing information manually through printed documentation, thus increasing business value. Sriram et al. (2000) asserted more businesses are adopting this approach to business data management, increasing use of automation and EDI to take advantage of business process efficiencies. These benefits can help organizations improve performance over time.

Migrating organizational processes to IT platforms for standardization leads to changes for organizations. Success of implementing EDI ldepends on managing change during integration of IT system s(Tuunainen, 1998). Mackay and Rosier (1996) contended communicating across organizations, standardizing how data are shared, creating more efficient logistics, increasing productivity, and improving customer service can all be achieved through implementation of EDI. Success of implementing EDI involves integration of the system with current IT systems as well as IT systems of other suppliers (Tuunainen, 1998). Integration of systems ensures they are internally and externally compatible with other suppliers.

Investment in ensuring system compatibility will result in benefits due to decreased costs involved with manually sending, receiving, and interpreting information from customers and other suppliers. Larger organizations have more monetary resources to invest in system integration and implementation (Charoensiriwath & Sangkiettiyut, 2010). Standardizing business practices to create a more efficient supply chain can be achieved with EDI. The best EDI systems are integrated with existing supply chain management systems to increase efficiency and organizational capabilities (Mackay & Rosier, 1996; Sriram et al., 2000). Mackay and Rosier (1996) determined the success of

EDI is contingent upon the number of suppliers who implement the system within supply chain networks. Tuunainen (1998) asserted when suppliers successfully integrate EDI into their organization, there is a complementary increase in the effectiveness of the industry. This leads to a positive impact on customer service involving reduced transactional costs associated with requisitions, payment reconciliation, and approvals that are normally completed through paperwork (Nguyen & Hoang, 2022). While multiple factors impact the success of EDI integration, when this integration is successful, resulting business efficiencies improve overall supply chain effectiveness.

IT System Integration

Technical factors and managerial decision-making can impact success of supply chain leaders when integrating IT systems. Managers could have a greater impact on success of organizations if they research costs and timing of integration, as well as risks and benefits. If managers have a better understanding of how to implement IT systems, chances of improved organizational performance may increase (Fusch et al., 2018). It is important for supply chain managers to learn about integration processes before moving forward with implementing systems. Managerial decisions impact execution of transactions and cooperation, collaboration, and information sharing with other organizations (Kauremaa & Tanskanen, 2016). Knowledgeable supply chain managers are needed to manage technical factors associated with IT implementation.

There are many technical factors and required criteria needed for successful EDI implementation and integration for automotive manufacturing companies who use these systems to communicate with their customers and other suppliers. Technical factors

needed for successful EDI integration include: (a) organizational readiness, (b) security regulations, (c) information systems currently in use, and (d) external competitive environment (Kauremaa & Tanskanen, 2016). It is important to review these factors to improve chances of success. To be successful, EDI integration involves selecting appropriate EDI solutions providers, providing identification, and ensuring necessary communication and integration factors needed for information systems (Vrbová et al., 2018). Factors associated with successful EDI integration require dedicated human and capital resources to fund technical capabilities needed for implementation and integration (Bilgihan & Wang, 2016). There are many steps during the integration process with technical factors that should be understood by implementing managers prior to execution. Successful understanding of factors needed for implementation of IT systems will allow supply chain managers to begin connecting with other like organizations in order to build supplier partnerships.

Impact on Partnerships

Supplier partnerships are relationships that are built through face-to-face engagement, email, phone, and IT systems. Integrating multiple suppliers within networks takes time and can be a complicated process (Nguyen & Hoang, 2022). Partnerships between automotive manufacturing suppliers can be developed using IT systems to improve ease of collaboration. Using IT systems to share information is more efficient than other forms of communication in terms of automatically sharing information in real time (Rached et al., 2015). With IT systems, automotive manufacturing supply chain leaders can work together to create more efficient supply

chains by sharing customer, service, and product information. A tier 1 supplier is a supplier that is geographically located in the same country as the OEM, and therefore supplies materials directly to the OEM (Tolmay, 2017). EDI is an information exchange system and best suited for large tier 1 suppliers and automakers as it is complex and costly (Charoensiriwath & Sangkiettiyut, 2010). Tier 1 suppliers have the resources to implement and maintain EDI systems, as well as capital funding to afford to buy them.

Costs of implementation can be a hindrance to many suppliers who are looking to advance their IT capabilities. Initial costs associated with system implementation are returned via reduced operating costs with more sophisticated IT systems (Marsaud, 1993). This system can be used as a tool to manage transactions and communications with various suppliers. Having a supplier in the same country as the OEM can minimize costs and risks associated with shipping products and makes communication between businesses easier. Fusch et al. (2018) determined that information sharing, through improved internal processes with IT capabilities, can positively influence supplier performance. Implementation of IT systems, like EDI, can lead to a more efficient automotive manufacturing supply chain for both large suppliers and small and midsize enterprises, who are managing large amounts of data from both customers and other automotive suppliers. To have a positive link between implementation of IT systems and performance improvement in automotive supply chain companies, managers need to have a better understanding of how implementation of IT systems can impact organizations' performance.

Managerial decision-making associated with implementation and use of IT systems can drive business and supply chain improvement. Managers need to ensure that opportunities for improvement are identified that best fit needs of organizations. Decisions made by managers impact integration of IT systems (Kauremaa & Tanskanen, 2016). These decisions include what type of systems to adopt for their organization, how much money will be put into systems for customization, and when the implementation process begins (Kauremaa & Tanskanen, 2016). Implementing IT systems is a logical decision that managers can make to improve performance of the supply chain network. IT implementation could be part of daily strategies used by supply chain leaders in terms of developing a broad understanding of technical complexities of IT systems (Power & Gruner). Managerial decision-making is one of the factors that drives successful IT process implementation. Leaders who implement IT systems to manage the supply chain saw a reduction in costs and increases in profits over time (MacKay & Rosier, 1996; Power & Gruner, 2016). Automotive manufacturing managers should continuously evaluate their ability to implement innovative information and communication technology by reviewing on time delivery metrics and customer satisfaction surveys (Peters et al., 2016). By reviewing this data, organizational leaders can determine if they are meeting expectations of their global customers (Peters et al., 2016). Continuous managerial decision-making may help to positively influence operational efficiencies in automotive manufacturing supply chains, which may help to improve organizations' ability to achieve competitive advantage.

Adoption of IT systems can be beneficial to partnering businesses helping to improve communication between organizations that is needed to improve products and services for their customers. IT systems allow for suppliers to increase amount and complexity of information that is shared (Nguyen & Hoang, 2022). Another success factor involving integration and implementation of IT systems like EDI is building of partnerships. When organizations decide to partner with other suppliers, communication standards are created and agreed upon by both organizations (Marsaud, 1993). Developing partnerships through IT system integration across multiple businesses can provide benefits to suppliers (Marsaud, 1993; Peters, 2000). This electronic communication allows for real-time exchange of information. Tier 1 organizations share information with other suppliers in their network and customers, which allows them to improve their service and products (Marsaud, 1993). IT systems help to process information more efficiently, leading to an increase in transparency, information sharing, and partnerships among suppliers (Busse et al., 2016). IT systems can be used to enable internal and external integration of supply chains both domestically and globally. This allows supply chain partners to share large volumes of complex information, visibility is increased and performance is improved (Srinivasan & Swink, 2015). These benefits help to improve supply chain speed between multiple suppliers and retailers.

As with many relationships, trust is needed for successful supply chain partnerships. Piderit and Flowerday (2014) asserted to build trust in terms of supply chain collaborations and partnerships, four objectives needed to be implemented to mitigate risk: (a) purpose, (b) performance, (c) process, and (d) controls. Developing trusting

relationships with supply chain business partners can be enhanced through use of IT systems. Piderit and Flowerday also asserted managers need to constantly communicate feedback regarding IT performance within partnerships. Lack of trust and incompatible information systems are two of the most common risks that puts supply chain partnerships in jeopardy of failing (Huong Tran et al., 2016). To keep levels of trust high and risk levels low in partnerships, clear processes of using IT systems should be established, and flexible control systems should be put in place.

Creating a process for implementation and integration allows for optimal benefits and usage of the IT system. IT-supported integration has given supply chain leaders insight on improving costs, flexibility and quality of products and services (Srinivasan & Swink, 2015). These insights help leaders in their decision-making processes. Srinivasan and Swink (2015) asserted that without IT systems the sharing of information to assist in coordination and decision making among supply chain partners would be very difficult, limiting the communication needed to efficiently meet the demands of the customer. Power and Gruner (2016) further asserted that complex economic and business partnerships among suppliers can add to the complexities of implementing IT systems. Sharing information using IT systems enhances coordination and decision making by creating a more efficient way of communicating. To mitigate these complexities Arantes et al. (2018) identified characteristics needed to integrate supply chains, which include: (a) trust, (b) sharing of information, (c) partnership, (d) cooperation, (e) collaboration, and (f) coordination. The key to a successful integration between organizations is dependent on a collective understanding between partners to reach a global objective

(Arantes et al., 2018). Success and benefits are achieved by supply chain leaders mitigating complexities associated with the integration and implementation process. Benefits associated with integrating supply chain include the reduction in costs and responsiveness to an everchanging market (Kashani & Baharmast, 2017). These benefits may help to improve the efficiency of supply chains.

Managing Risks

With any new process or system integration there are risks involved. Sharma and Routroy (2016) furthered the discussion on risk by examining how information risks impact a supply chain due to information sharing. To mitigate risks, supply chain leaders could build partnerships to collaborate on ideas to improve profits, minimize costs, and improve the level of service to their customers. The robustness and resilience of a supply chain are both needed to improve how well risk management practices improve the performance of supply chains (Zeng & Yen, 2017). Risk factors that jeopardize organizations the most are information breakdown, information leakages, and limited information sharing (Sharma & Routroy, 2016). Risks within the implementation and integration process have to be established and managed during and after new systems are in place.

Working with other suppliers can assist in assessing risks within a supply chain network. Zeng and Yen (2017) asserted that supply chain partnerships help to improve the resilience of supply chains. To best manage risk factors associated with information sharing in supply chain networks, Sharma and Routroy (2016) suggested that the risks be continuously updated, paying close attention to those risk factors that are less common.

When supply chain performance is improved across the network, companies can achieve competitive advantage in the market (Zeng & Yen, 2017). IT is used as a resource to share information between partners to increase knowledge across the supply chain network (Kremljak & Kafol, 2015). Artsiomchyk and Zhivitskaya (2015) determined that with the enhancement of supply chain networks, firm's performance is also positively impacted. Improved resources and partnerships can help to mitigate risks associated with supply chain performance. Risks associated with information sharing suggests that risks in supply chains go beyond moving products to customers, but are also present in partnerships between suppliers within a supply chain network.

Firm Performance

Improved practices and processes within an organization can also improve overall supply chain network performance. Through supply chain integration, Kim (2017) determined that there was a strong relationship between the integration of IT and firm performance. It was also determined that firm performance is dependent on the type of partnerships built within the supply chain and is greatly reliant by the integration of IT systems at each supplier organization (Liu et al., 2016). Partnerships between suppliers can have a positive impact on firm performance with the integration of IT systems. Chan et al. (2017) determined that strategic flexibility has the greatest positive impact on firm performance. Strategic flexibility involves being agile with strategies involving IT and supply chain management (Chan et al., 2017). Erdil and Erbıyık (2017) found that using IT to improve the buyer-supplier relationship: (a) helped to improve the flexibility of the

supply chain, (b) improved service and quality of products, and as a result, increased firm performance.

Firm performance is also impacted by allocating resources, integrating supply chains, and strengthening IT competency as these are elements that greatly impacted both financial and operational performance within a firm (Liu et al., 2016). While using control variables such as: (a) industry, (b) ownership, (c) firm size, and (d) IT department size, Liu et al. (2016) discovered that the level at which an organization was able to use IT to integrate their supply chain, greatly impacted its ability to increase performance. For improved firm performance supply chain integration should have, synchronized planning, operational coordination, and strategic partnerships. Supply chain integration must align with IT competency for optimal alignment (Erdil & Erbıyık, 2017). To achieve improved performance, Ajamieh et al. (2016) suggested that firms invest more into IT infrastructure to increase their IT knowledge.

The implementation of IT systems, like EDI, into an organization's current technology has not always been successful in improving firm performance (Hwang & Lee, 2016). According to Hwang and Lee (2016), issues with technology acceptance, relationships between organizations, and poor planning has caused some firms to decrease their performance and increase their transactional costs. Vanpoucke et al. (2017) argued that the integration of supply chain partners should go beyond information exchange. Risk evaluation prior to new IT system implementation may help to decrease the impact on costs and organizational performance. Consequently, some organizations may adopt new technology without evaluating the risks and negative payoffs the firm

might experience due to a lack of resources, capabilities, and stability. Strategies that include operational integration of multiple tiers were determined to have the greatest impact on competitive advantage (Vanpoucke et al., 2017). Hwang and Lee (2016) determined that both technology risks and managerial challenges can negatively impact the implementation of IT systems and a firm's ability to improve their competitiveness.

Conceptual Framework

IT can be a viable resource used by organizational leaders to gain and sustain competitive advantage in an ever-changing market. The idea of analyzing external resources was first introduced by Wernerfelt. The concept of analyzing resources was further explored by Barney who developed the RBV theory. Barney (1991) asserted that an organization needed unique resources, like innovative IT, that the competitors lacked to gain a competitive position.

Ruivo et al. (2016) contended that RBV theory supports the understanding that IT increases business value. Implementation of IT systems can improve an organization's ability to improve and sustain competitive advantage. Gupta et al. (2018) evaluated how RBV is used in understanding how information systems help organizations achieve sustainable competitive advantage. Gupta et al. (2018) outlined seven ideas that explain how the use of RBV impacts competitive advantage: (a) obtaining diverse resources within an organizations, (b) implementing resources that can be used to improve organizational strategies, (c) implementing different types of strategies, (d) implementing strategies that help to increase organizational performance, (e) determining which available resources are needed for improved organizational performance, (f) obtaining

unique resources that can assist organizations in achieving and sustaining competitive advantage, and (g) experiencing additional organizational benefits due to having a more competitive position.

Using a structural equation model, Yu et al. (2018) analyzed data collected from manufacturing companies in China to examine the impact that data-driven supply chains have on an organization's financial performance. In this quantitative study Yu et al. (2018) drew on the RBV theory to support their research and analysis. Park et al. (2017) also used RBV to explain how organizations can achieve competitive advantage by integrating internal and external IT systems using network resources. IT was determined that coordination between suppliers with the use of information systems and improved supply chain responsiveness were the biggest drivers to positively impacting financial performance, supply chain capabilities, and competitiveness. Consequently, these firms face the challenges of integrating, building, and reconfiguring the internal and external IT resources needed to achieve competitive advantage (Park et al., 2017).

Other frameworks that would have been appropriate for this study include transaction cost economics (TCE) framework and technology-organizational-environment (TOE) framework. A TCE framework is an analytical framework used to evaluate the transaction costs associated with a supply chain (Garfamy, 2012). This framework also examines contractual relationships between suppliers. The TOE framework looks at businesses on a technological, environmental, and organization level to understand what influences the adoption and implementation of new innovative ideas

(Baker, 2011). This framework begins its focus on implementing innovations at the development stage.

Competitive Advantage

Achieving competitive advantage can be achieved through sustainable supply chain practices. Bilgihan and Wang (2016) asserted that competitive advantage was achieved by the allocation of both human and financial resources, and investment in more innovative IT systems. Bilgihan and Wang further asserted that IT not only created competitive advantage, but also helped to reduce operational costs and improve operational efficiency. Competitive advantage can provide an array of benefits to an organization. Colin et al. (2015) determined that growth in operational performance and competitive advantage are achieved due to the positive impact of information and communication, technology, and supply chain management strategies. Bilgihan and Wang (2016) and Colin et al. (2015), suggested that IT has had the greatest impact on organizations achieving competitive advantage. Shao and Lin (2016) determined the productivity growth of an organization over 11 years was due to the implementation of new technology. The improved technology helped to create a more efficient supply chain, thus strengthening the organization's ability to achieve competitive advantage (Shao & Lin, 2016). IT is a tool used by organizations to assist in gaining a competitive advantage.

Organizations looking to implement IT systems must first evaluate their resources. Stratopoulos (2017) recommended that decision-makers evaluate the performance, financial payoffs, and an organization's ability to achieve competitive advantage to determine if implementing emerging IT systems would be beneficial to an

organization. Financial and time investments are necessary for productivity and competitive advantage benefits to be experienced long-term. Stratopoulos (2017) asserted that both internal and external influences can impact the duration of adopting emerging technology. Internal and external influences can also extend the benchmark that managers have set to begin experiencing competitive advantage and return on investment (Stratopoulos, 2017). Ajamieh et al. (2016) also determined that organizations that can take advantage of internal resources can better manage technical capabilities needed to improve relationships between other suppliers and customers and increase an organization's competitiveness.

Building relationships can be an essential piece needed for achieving competitive advantage. Wu et al. (2017) asserted that internal and external collaborations lead to improved performance, which can assist an organization to achieve competitive advantage. This determination was made by establishing four core competencies of supply chain practices needed for achieving competitive advantage. These competencies included: (a) innovation, (b) flexibility, (c) cost, and (d) speed of integration of IT systems by (Wu et al., 2017). Datta (2016) also investigated supply chain practices involving information sharing, logistics, collaboration, and risk identification. These practices can be used to determine the alignment within an organization needed to achieve and sustain competitive advantage (Gunasekaran et al., 2017). Competitive advantage was ultimately achieved by implementing performance measures monitored by managers and collaborating with suppliers (Datta, 2016).

There are other factors that contribute to a supply chain organization achieving competitive advantage. Technology driven processes, practices, products, and services created an innovative supply chain needed to address customer problems, meet demands, and improve competitive advantage (Kwak et al., 2018). Additional factors that contributed to achieving competitive advantage included available funding, number of team members, customer satisfaction, and ability to integrate IT systems and processes successfully (Gunasekaran et al., 2017). The need to evaluate factors outside of IT for competitive advantage achievement was also proposed. Tripathy et al. (2016) found that implementing up-to-date IT systems throughout the supply chain process is key to achieving competitive advantage as it helps to strengthen the effectiveness of the logistics process.

The integration of information systems positively affects the performance and competitive advantage of the organization (Gupta et al., 2018). Information systems were considered an internal resource for organizations that were acquired, integrated, and controlled by the firm (Gupta et al., 2018). Tolmay (2017) contended there was a strong positive relationship between sustaining supplier relationships, improving relationships with customers, implementing sustainable processes, and achieving competitive advantage. Technology is an important tool used by organizations to improve productivity and competitiveness (Zondo, 2018). By using technology, industry systems and processes needed to meet customer demands were improved. It was also determined that using technology helped to increase labor productivity and reduce material costs (Zondo, 2018).

An organization can gain competitive advantage if requirements were met for customer experiences, workplace features, and supply chain efficiency by using various IT systems (Gellweiler, 2017). Kaur and Mehta (2017) determined that all dynamic capabilities had a significant impact on an organization's competitiveness.

Trantopoulos et al. (2017) examined how external resources and IT influence process innovation performance and a firm's competitiveness. Zondo (2018) supported the idea that using IT systems can help improve processes needed for competitive advantage. The various processes are used when interacting with both customers and suppliers. Trantopoulos et al. (2017) determined that the investment in IT helps to improve process innovation, reduces enterprise-wide costs, and improves operational efficiency. Kaur and Mehta (2017) determined capabilities of IT systems having a positive impact on an organizations competitiveness. IT can help to change processes within an organization by exchanging knowledge internally and with external resources making it clear that organizational leaders should invest in IT systems that enhance employee's ability to connect with external resources to increase productivity (Trantopoulos et al., 2017). Therefore, IT improves information visibility with other suppliers.

Using IT can facilitate information sharing in real time. Factors that improve response time to customer demands and have a positive impact on the environment are beneficial to the organization and the customer (Kremljak & Kafol, 2015). In addition, these factors help organizations achieve competitive advantage (Kremljak & Kafol, 2015). Kremljak and Kafol (2015) discovered that by increasing communications

between agents involved in purchasing planning, scheduling, logistics, and quality by using information sharing technology, helped to improve the manufacturing organization's competitive advantage and responsiveness to an ever-changing market in this multi-literature survey. Piderit and Flowerday (2014) stressed the importance of organizations building trust with other organizations to use information sharing to increase competitiveness. Though building trust was crucial to the relationship, there was still some risk involved with information sharing through IT. The implementation of environmentally friendly supply chain practices was more favorable to customers, which helped organizations achieve competitive advantage (Maryniak, 2017). Maryniak (2017) determined that this was achieved by implementing supply chain practices that were geared at protecting the environment. These practices should be managed from the product design process and through product flow within the supply chain (Maryniak, 2017). These improved practices contribute to a organization's social responsibility.

Social Responsibility

Social responsibility is important to an organization's brand and mission and how they impact communities. As IT is used to facilitate communications between suppliers to increase supply chain efficiency, corporate social responsibility (CSR) guidelines can also be communicated as partnerships are made between like organizations (Urbaniak, 2015). CSR is an organization's responsibility to internal and external stakeholders, such as employees, suppliers, partners, customers, and governmental and non-governmental agencies who represent the interests of the environment and surrounding community (Stojanovic-Aleksic & Boskovic, 2017). Various types of organizations participate in

CSR initiatives. Jean et al. (2016) discovered that CSR initiatives had a positive impact on customer satisfaction and increased environmentalism. These positive impacts help organizations to achieve competitive advantage in their market.

CSR has both internal and external impacts. Urbaniak (2015) discovered partnership guidelines helped to reduce supply chain risks, by improving working conditions, reducing negative environmental impact, and increasing product safety. Urbaniak asserted guidelines also helped organizations to limit the amount of environmental resources they previously used and improved the respect of human rights by focusing on the health and safety of their employees. Jean et al. (2016) determined that CSR initiatives had a positive impact on both customer satisfaction and environmentalism. CSR initiatives also have a positive impact on communities.

Supply Chain Management

The reliability of communication can be improved with the use of IT among suppliers. IT is currently seen as the key resource used to improve efficiency for Supply chain management (Thöni & Tjoa, 2015). Thöni and Tjoa (2015) determined that the strongest relationship occurred between supply chain management and sustainability, and the second strongest relationship between supply chain management and IT. Mathivathanan et al. (2018) also identified sustainability as an important factor in supply chain practices during their decision-making process. The use of IT resources assisted organizations in improving delivery methods by creating better coordination between companies, positively impacted social sustainability for suppliers in developing nations, and increased the level of monitoring by allowing for increased data exchange (Thöni &

Tjoa, 2015). IT allows for the quality of processes and standards to be improved, thus allowing for more timely communications.

Improved IT is just one of various practices needed to achieve competitive advantage. Mathivathanan et al. (2018) also examined sustainable practices needed for stable supply chain management using a study population of 50 automotive company employees in India : (a) adoption of new technology, (b) improved communication, (c) driver performance improvement, and (d) development of partnerships., Mathivathanan et al. (2018) proved that internal managerial decision making was most influential when implementing successful sustainable supply chain management practices. Srinivasan and Swink (2015) asserted using IT systems could assist in coordination and decision making among supply chain partners, by providing a more efficient platform to communicate. Strict government policies and regulations in India contribute to other influences of sustainable supply chain management among supply chain partners, thus increasing the need for improved practices (Mathivathanan et al., 2018). IT plays an essential role in improving supply chain management practices.

Velda and Dhiba (2017) said relationships among suppliers, supplier quality, geographic proximity between suppliers, communication, and cross-functional teams were found to improve supply chain performance and relationships among suppliers showing a positive link between supplier relationships and supply chain management. In comparison, many risk factors could create a breakdown of information between suppliers (Sharma & Routroy, 2016). Having an IT system that allows for rapid exchange of information can reduce risks associated with supplier relationships.

Innovation can be an important factor in supply chain management. Koster et al., (2017) conducted a qualitative case study to explore supply chain management processes and innovation. Koster et al. (2017) determined human agency was an important resource needed for the implementation of management innovation. Koster et al also developed a sustainable supply chain management innovation model which shows two stages where both pioneers and leaders have specific roles to implement innovative sustainable supply chain management practices. Adebanjo et al. (2017) argued that innovative resources needed for supply chain management practices may need to be acquired external from the organization. Innovation drives the improvement of technological processes needed for these practices.

Innovation

Innovative processes and resources play an integral part in improving supply chain management practices in the automotive manufacturing supply chain. Adebanjo et al. (2017) argued that the RBV perspective relates to an organization's leader's ability to use innovative external resources and acquire relevant knowledge to attain and sustain competitive advantage, by improving business performance. Adebanjo et al. determined there was a positive relationship between innovative resources, manufacturing performance, and quality. An emphasis on understanding customer demands and requirements played a role in an organizations' ability to acquire the proper innovative external resources (Adebanjo et al., 2017). Views on using internal or external resources may vary. Koster et al. (2017) determined that resources needed for innovation could be found within organizations who operate across various countries. Multinational

organizations may be able to use their own resources where available while other organizations may have to look externally for those resources to achieve similar results.

Managing risks is an important task in developing an improved supply chain management process. Kwak et al. (2018) concluded that innovative supply chain practices had a positive influence on risk management, which in turn supports competitive advantage. Kwak et al. further asserted technology driven processes, procedures, products, and services create an innovative supply chain. Kwak et al. concluded that a change in supply chain practices was needed to address customer problems and meet their demands. Wu et al. (2017) asserted that technological innovation is one of the four competencies needed to achieve competitive advantage. Use of technology has greatly improved how companies do business and manage their supply chains.

Innovative supply chain practices are greatly used by multinational companies. Kaur and Mehta (2017) asserted that competitive advantage could be achieved at multinational companies by efficiently using organizational resources to provide better services and products than their global competitors. Kaur and Mehta (2017) determined that all dynamic capabilities had a significant impact on an organization's competitiveness. The top three capabilities were (a) innovative capability, (b) adaptive capability, and (c) absorptive capability. Handal (2017) determined that the positive relationship between adaptability and innovation could be achieved through the elimination of nonvalue added activities identified in distribution processes, thus

increasing organizations' competitiveness. Innovative supply chain practices improve firm performance needed to gain competitive advantage.

To increase competitive advantage, leaders should also consider the broader aspects of business relationships and of the supply chain. U IT alone cannot increase customer capital and competitive advantage (Leal-Millán et al., 2016). The strategies behind relationship learning and green innovation performance can potentially be the driving factors behind initiatives to gain competitive advantage. Having strategies in place to help build relationships and improve performance are impactful through the use of IT systems, as they help managers to connect and build relationships with their customers so that they are better able to assess their issues and priorities. According to Shah et al. (2017), once issues and priorities of customers are identified, IT can also be used to improve products and services. L Leal-Millán et al. (2016) determined organizational leaders must gain knowledge regarding technology and the environment to improve products and services offered to their customers. By understanding technology, their chances of improving firm performance can be increased.

The relationship between a sustainable supply chain and the use of innovation is important to consider. Artsiomchyk and Zhivitskaya (2015) asserted that supply chain innovations combine IT and operational procedures to improve efficiency. Variables are needed for the development of innovation are time for organizations and their employees to acquire the capabilities, experience, and knowledge needed to develop new products and services (Artsiomchyk & Zhivitskaya, 2015). There are four components that are

needed to make up an innovative supply chain model: (a) hardware, (b) software, (c) human factor, and (d) organization (Artsiomchyk & Zhivitskaya, 2015).

In addition to variables linked to innovation and their influence on the supply chain model, other factors have been identified which also influence the supply chain model. The human factor, which consists of the management, training, and development of employees, is the main resource needed for the implementation of innovative technology strategies that help to improve response time to consumers, logistics, and marketing (Artsiomchyk & Zhivitskaya, 2015). Leal-Millán et al. (2016) found human resources and IT are tools needed to implement innovative strategies necessary to improve supply chain management practices. The ability of leaders to cultivate innovation in their workforce is important to success.

In addition to enabling innovation in the work environment, leaders need to consider relationships throughout their supply chain. Artsiomchyk and Zhivitskaya (2015) concluded relationships developed throughout the supply chain network are needed to identify new opportunities for strategic innovations. Artsiomchyk and Zhivitskaya (2015) suggested an integrated methodology to develop and manage innovations needed to create sustainable supply chain processes. An integrated methodology incorporating IT and innovation can be used for successful development and implementation of enterprise information systems. Leem and Kim (YEAR?) determined five components are used for an integrated methodology: (a) information strategy planning, (b) economic justification and measurement, (c) enterprise information system appraisal, (d) package software evaluation, and (e) unified modeling tools. IT

systems are used as a resource to share information between partners to increase knowledge across the supply chain network (Artsiomchyk & Zhivitskaya, 2015).

Knowledge integration and flow has greatly impacted competitive advantage of supply chain networks by improving communications between suppliers (Zhang et al., 2018). Zhang et al. (2018) contended the greater the density of a supply chain network, the greater the long-term collaborations, cooperation, and communication will impact knowledge innovation. Zhang et al. further contended that network density will have a positive impact on knowledge innovation and the diffusion of knowledge throughout a supply chain network. The number of organizations in a supply chain network may impact performance depending on the innovations shared by each organization. Zhang et al. (2018) asserted that the performance of innovation will continue to improve as the density of supply chain networks increase. As more companies join a supply chain network, Original Equipment Manufacturers(OEMs) are able to access a larger knowledge base. Zhang et al. (2018) stressed the importance of external collaborations and strengthening relationships with internal partners also to increase innovation within supply chains. This is only possible if IT systems across supplies are linked and compatible.

Though innovation is an ideal concept, implementing and attaining innovative processes and resources is not always easy. Othman et al. (2018) asserted that resources such as implementing innovative products and services that are environmentally friendly, incorporating sophisticated technology, and investing in research and development can help a company achieve competitive advantage. Other findings contradict Zhang et al.

regarding the value of this knowledge network. Goracinova et al. (2017) showed that there were significant barriers in terms of introducing innovative technology. For example, initiatives and policies that are put in place to improve supply chains are often geared towards larger OEMs and small and medium sized enterprises (SMEs). Knowledge creation and process innovation did not directly align. Challenges varied from organization to organization depending on size, sector, and country of origin. While Goracinova et al. (2017) argued innovative competencies are essential to the flexibility and growth of SME supply chains, there are barriers to successful management of these competencies. Financial barriers are often present. Implementing new IT systems and ensuring compatibility across a supplier network can be cost prohibitive.

Some factors that were determined to have a determinative impact on the future of organizations included: (a) cost pressure, (b) product variety and technological complexity, (c) customers' expectations towards drivability and safety, and (d) role of information and communication technology in manufacturing (Peters et al., 2016). Peters et al. (2016) suggested automotive manufacturing company leader continuously evaluate their ability to implement innovative information and communication technology to meet the expectations of their global customers. Implementation planning can be integral in adopting IT systems. Shah et al. (2017) suggested organizations create a gradual implementation process, which allows organizations to better handle cost pressures associated with adopting new technology.

Conclusion

Upon review of professional and academic literature, I have found that there are a variety of supply chain management strategies that can be used to achieve competitive advantage in the automotive industry. The strategies discussed in this literature review range from basic to very complex. Basic strategies may include information sharing among suppliers and improving social responsibility, whereas complex strategies are ones that require the implementation of advanced IT systems internally to manage supply chains, as well as IT systems needed external partnership communications. Managers of automotive manufacturing supply chains are tasked with assessing the various strategies and determining which are feasible to implement at their organization to help them gain a competitive advantage. The building of partnerships through information sharing via IT systems seemed to be the most popular strategy among supply chain managers at both small and large organizations.

Transition

In Section 1, I included foundational information of this doctoral study involving strategies used to increase competitive advantage among automotive manufacturing supply chains. This includes the background of the problem, problem and purpose statements, and nature of the study. I addressed what the problem is, what steps I took to research the problem, why researching this problem is important, and how my research can potentially improve future business practices.

I also included information about the methods and processes I used to collect data. I explained the research question, interview questions, conceptual framework, operational

definitions, assumptions, limitations, and delimitations related to my research. I established a lens to execute my research, gathered information through open-ended questions, and determined outcomes of my research. I also addressed the significance of the study to discuss key points about how my research may positively impact future business processes. Lastly, I included a review of professional and academic literature.

The literature review included a discussion of strategies used by manufacturing supply chain leaders to achieve competitive advantage. These strategies included: implementation of IT systems, development of partnerships, adoption of innovative resources and processes, and inclusion of CSR initiatives. The RBV theory was also discussed in more detail in this section to describe how managers use innovative external resources to attain and sustain competitive advantage. I summarized strategies that were outlined in the literature review.

Section 2 includes my role as the researcher and parameters for selection of participants and how their experiences impact achievement of competitive advantage at their organizations. I also discuss the research method and design, population and sampling, and reliability and validity. These critical elements are foundational for my findings that are discussed in Section 3.

Section 3 includes a presentation of my findings. I discuss how existing literature compares to my findings, as well as how my findings can be applied to future business practices. Section 3 concludes with implications for social change and recommendations for action and further research.

Section 2: The Project

In Section 2, I discuss how research is executed in my doctoral study. This section includes a restatement of the purpose of this study, descriptions of my role as the researcher and how I collect data, a detailed description of participants who were used in this single qualitative case study, and information regarding the research method and design. Section 2 also includes details on how data were collected and analyzed. Lastly, I discuss how validity and reliability were maintained, finishing with a transition and summary section that includes key points.

Purpose Statement

The purpose of this single qualitative case study was to explore information system strategies used by leaders in automotive manufacturing supply businesses to achieve competitive advantage. The targeted population was leaders from one automotive manufacturing supply chain company located in North America who have a global presence and achieved competitive advantage through implementation of information systems. This study will lead to social change by identifying strategies for sustainable competitive advantage and offering supply chain management processes that improve cost and operating efficiencies, which can help organizations provide sustainable employment opportunities for their communities.

Role of the Researcher

In this qualitative case study, my role as the researcher was to identify strategies that leaders in automotive manufacturing businesses use to achieve competitive advantage, with a focus on IT systems. As the researcher, I was the primary instrument to

collect data. Though I had some knowledge of the industry, my goal as the researcher was to gather reliable data from information system experts without influencing them. To eliminate researcher bias, which occurs when personal opinions and assumptions are present during data collection and analysis, data should be collected from multiple sources to improve validity (Baškarada, 2014).

As a previous employee of the organization that I collected data from, I have some bias as the researcher. I have worked in the automotive manufacturing industry for 5 years, with much of my work being done on the supply chain. As I have witnessed the impact that IT has on achieving competitive advantage, I have a close relationship with the topic. My goal is to seek knowledge of those IT professionals who have firsthand experience with adoption and implementation processes within the organization.

To achieve the most reliable results, I followed standard qualitative case study guidelines. Conducting unbiased and ethical research in qualitative case studies is the responsibility of the researcher (Gaikwad, 2017). For validity when collecting data from participants, *Belmont Report* protocol should be consulted prior to data collection. *The Belmont Report* outlines basic ethical principles when using human subjects in research. These principles are: (a) respecting participants by acknowledging and protecting autonomy, (b) treating participants ethically by doing no harm and maximizing benefits from participation, and (c) being fair to all participants regardless of their individual efforts, contributions, and merits (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Adhering to these guidelines helped me to eliminate researcher bias and ensure all participants were treated fairly.

In this qualitative study, I conducted interviews with participants. Yin (2014) suggested an in-depth interview protocol be used to outline vetted procedures and rules for conducting research in order to minimize researcher bias and protect participants. Interview protocols have guidelines to ensure the most reliable research is conducted. The protocol must include a description of the case study, procedures that have been used in the field, research questions, and any additional information, such as biographical information, needed for case study research (Yin, 2014).I used an interview protocol while conducting semistructured interviews to minimize any personal biases I may have brought to this study.

Researcher bias can skew data and results in qualitative studies. Another method I used to minimize bias is bracketing. Bracketing, which requires researchers to put aside their own beliefs or what they already know about a phenomenon, is a process that is used to validate data collection and analysis (Chan et al., 2015). For bracketing, researchers must first recognize potential biases to minimize their influence on participants. Using a reflexive journal to write down perceptions and feelings enables researchers to understand their position in the process (Chan et al., 2015). Researchers should also ask open-ended questions during semi-structured interviews to minimize bias. Bracketing and journaling was essential to producing valid research for my doctoral study.

Participants

For my study, I used semistructured interviews to gather pertinent information from participants. In qualitative research, interviews are used to understand participants'

perceptions and experiences involving a particular phenomenon (Rosenthal, 2016). For my doctoral study, I chose to interview participants who were leaders within the automotive manufacturing supply industry. To gain knowledge about a specific topic, it is important for researchers to find participants who are experts in that field of work or study (Rosenthal, 2016). I chose to interview participants with automotive manufacturing IT expertise. Selecting participants should be purposive and should work in a field that relates to the research topic (Cleary et al., 2014). Purposive sampling helps to increase rigor of the study and credibility of results via selecting participants who are most likely to provide the most appropriate information and feedback as it relates to research questions (Campbell et al., 2020).

Via purposive sampling, I selected participants who were leaders in the automotive manufacturing industry with experience in terms of implementing strategies to achieve competitive advantage, as these individuals were most likely to contribute ideas that related to my research question and overall study. All participants had the option to opt out of the study at any time. Open-ended questions were asked in order for participants to freely share their knowledge regarding the topic. Choosing the right participants is determined by what information is needed, the purpose of gathering this information, and whether it is credible and useful (Cleary et al., 2014). Including the right participants in my study allowed for gathering useful information. Gathering demographic and background information about participants also helped to determine if they were suitable for this study. My interview protocol included guidelines that minimized researcher bias and ensured participants were able to provide truthful

information that was not coerced. Interview protocols are useful as they provide a neutral framework to help guide structured conversations with participants, which can help to minimize researcher bias (Yin, 2018).

The organization where I chose my participants is where I used to work. I had minimal issues gaining access to these individuals, as I have already established good rapport with executives at this organization. Though I already have built successful relationships with many individuals at this organizations, I had to approach the participants in an ethical manner. By following instructions outlined by the Walden University Internal Review Board (IRB), I was sure to conduct my research in a manner that protects the participant. I asked open ended questions as not to create bias when recording participant responses. I informed participants of their right to end the interview at any time without consequence if they no longer feel comfortable participating. I allowed participants to choose if they would like to conduct interviews on site at their place of employment, or at an outside location.

Research Method and Design

To produce a reliable doctoral study, I conducted research to gather and analyze information from industry experts. Research is used to develop a relationship between current knowledge and practice while demonstrating a valid, reliable, and rigorous process (Roberts et al., 2019). In research, a method and design should be identified to collect and analyze your data. The research method is the strategy you use to execute your plan. The research design is the plan you put into place to address your research question.

Research Method

The qualitative research method was chosen for this proposed study due to the descriptive and exploratory nature of the research question. Qualitative research methods are used to facilitate collection of detailed information from multiple participants (Simba et al., 2017). Quantitative research uses a hypothesis testing approach to examine variables' correlations or groups differences (Lyall & King, 2016). As I was not interested in testing a hypothesis to understand the correlations or differences among variables or groups, a quantitative research method was inappropriate. Likewise, the mixed methods approach was not appropriate. Mixed methods are typically adopted to support the shortcomings of either the quantitative or qualitative research method and to examine and explore various perspectives through multiple research techniques to understand complex phenomena (Tu, 2018). The mixed methods approach takes additional time to complete and with the time limitations needed to complete my study all necessary information may not have been obtained (Tu, 2018). The mixed method also required the implementation of a quantitative component, which was outside the scope of my doctoral study.

Research Design

A single qualitative case study was used to identify the data collected and analyzed in my doctoral study. A single case study involves conducting an in-depth analysis on an individual or group (Korstjens & Moser, 2017). The group consisted of five participants needed for data saturation. Glaser and Strauss (1967) defined data saturation as a point in data collection when no new data is discovered. To achieve data saturation, I ensured that no new data or information is found after interviewing my

selected participants. If new information was found, I would have interviewed additional participants until no new data was found. Other designs used for qualitative research include narrative, ethnography, and phenomenology. These other methods would not have been appropriate for this study as the narrative design focuses on putting together participants' stories around the phenomenon, ethnographer explore the meanings and behaviors related to a specific group of people, and phenomenologists explore how individuals understand the phenomenon and gives detailed accounts of their personal lived experiences (Korstjens & Moser, 2017). Since none of these designs would have been appropriate to explore and identify the impact of the research question, I chose the qualitative single case design.

Population and Sampling

The population for this study is leaders within the automotive manufacturing supply chain. For this study, I define a leader as anyone who is in a supervisory role or higher, who has at least 5-years experience in supply chain, automotive manufacturing, or IT. In research, it is more practical to take a sample of data from a population instead of collecting data from the entire population the research is studying (Acharya et al., 2013). I used purposeful sampling to gather research from my selected population. Purposeful sampling is used to preselect participants based off criteria set by the researcher (Lewis, 2015). Suri (2011) said sampling strategies that can be used by researchers that are practical, structured, and ethical for qualitative evidence synthesis include, snowball sampling, criterion sampling, purposeful sampling, and convenience sampling combination or mixed purposeful sampling (Suri, 2011).

For my single case qualitative research study, I used five research participants sample data from. The National Centre for Research Methods determined that the number of participants needed depends on the number of people the researcher has access (Baker & Edwards, 2012). I only sampled data from one organization, so finding five participants was not difficult. The National Centre for Research Methods also suggested that sampling from small groups can be extremely beneficial by offering depth into a very specific population. The number of interviews should increase when a controversial topic arises or new findings are uncovered (Baker & Edwards, 2012). My contingency plan was to have additional qualified participants readily accessible, so that there was no disruption in the continuation of the interview process.

Having additional participants accessible, ensured that I collected data from enough participants to achieve data saturation. Initially I conducted five interviews, no new information was found, so my interviewing concluded. If on the fifth interview, new information was discussed, I would have conducted two more interviews. If no new information were discovered at that point, I would cease conducting interviews. Since I had a small sample size, I used data triangulation to increase the reliability of my research. Data triangulation is used to increase the credibility of your research (Yin, 2018). I also conducted a document review by collecting information related to strategy implementation from the organization and annual performance reports.

To ensure that the right participants were selected, I developed participant criteria with basic questions that each participant had to answer before being selected. The questions (Appendix B) will offer insight into each participant regarding: (a) their current

role and title, (b) their educational background, (c) the number of years they have been with the organization, and (d) the number of years in the industry. Those who most closely met the established criteria were requested to participate in an interview. The organization where I interviewed participants was a local organization. My goal was to conduct all interviews on site, however, due to COVID-19 restrictions being in place I was unable to do so. I used Skype video system to conduct my interviews instead.

Ethical Research

To conduct ethical research, I had to first get approval from Walden's Institutional Review Board (IRB) to begin collecting data from my chosen organization. Once the organization gave me approval, research participants from the organization were identified. The next step in gathering data for ethical research is to obtain a signed informed consent form from each of your research participants (Gaikwad, 2017). Each participant received the consent form via email. Participants also received a copy of the interview questions that were used in the interview via email. Research participants were allowed to withdraw from participating in the study at any time and for any reason without penalty. There were no incentives in any form given to individuals who choose to participate in the study.

To produce valid and reliable research, there were specific protocols that I followed. The protocols that I followed are outlined in the *Belmont Report* (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) to ensure the privacy and protection of the research participants. The three basic ethical principles summarized in the *Belmont Report* are respect for others,

beneficence, and justice. Respect for others is protecting participants by ensuring autonomy in your research. Beneficence is making a conscious effort in securing the well-being of participants by minimizing risk involved in the research process. Lastly, justice is treating all participants equally and not manipulating the selection process by choosing individuals based on their vulnerability or ability to easily manipulate their responses. Participants were informed of any possible risks involved in the study. Research participants were also informed that each interview would be recorded and transcribed by me. Interviews are only be used for this study and are stored on a password protected hard drive for the next 5 years. Any hard copies of the interviews are also securely stored and will be shredded after the 5-year study completion date. To protect the identity of the research participants, they were assigned a participant number (ex. Participant 1, Participant 2, etc.).

Data Collection Instruments

Data collection instruments are essential to collecting information in a reliable way. For this single qualitative research study, I as the researcher was the primary data collection instrument (Yin, 2018). I collected data via semistructured interviews and reviewed documentation from the participating organization. I followed an interview protocol (see Appendix A) that used the eight open-ended research questions that are listed in Section 1. I also asked probing questions to receive clarification or additional information as needed throughout the interview (Given, 2008). I used a software that allowed me to record and transcribe the interviews that were used for member checking. Member checking is used to provide validation of collected data, clarification of

interview responses, and additional information that may have been missed during the interview (Madill & Sullivan, 2018). Following member checking guidelines assisted in collecting unbiased information.

Data Collection Technique

I collected data via semistructured interviews and reviewing documentation from the organization. The documentation that was reviewed included information regarding policies, procedures, and metrics. There are advantages and disadvantages of conducting semistructured interviews and reviewing archival documentation.

An advantage of using semistructured interviews as a data collection method for qualitative studies is being able to gather data from participants who have real life experiences with the topic of your chosen study (Rosenthal, 2016). Another advantage of conducting semistructured interviews is the researcher's ability to ask additional probing questions to gather additional information or clarification (Rosenthal, 2016). Interviews were recorded and transcribed to review content. I used member checking, by allowing participants to review my analysis of their responses to strengthen the reliability of the collected information.

Data Organization Technique

For this single qualitative case study, I conducted interviews using Skype as my method for gathering data. All interviews were recorded using the Otter App (http://otter.ai). Punch (2013) asserted that using a recording device is helpful in data collection and analysis as data collected during interviews tends to be lengthy. These interviews were transcribed for data analysis purpose. The Otter app provided both

recording and transcription services. Yin (2014) argued that transcription is necessary when achieving accuracy and reliability in your research.

As part of my study, I conducted a document review of outlined strategies used to achieve competitive advantage. These documents were provided by the organization and were only used in my study to gather additional data and pertinent information. For both data collection methods, I used a coding method to identify ideas and patterns within my research. Codes are an important part of qualitative research as it allows the researcher to use specific criteria to interpret data and group similar concepts across their research (Given, 2008). A codebook was developed with labels to organize themes and keywords. To refrain from any potential researcher bias, I also kept a reflective journal throughout the interview, archive review, and data analysis processes. Reflective journals are used to write down any thoughts or insights developed during these processes that should be kept separate from your study as they may impact the results of the interview or the researcher's interpretation of the findings (Yin, 2014).

Data Analysis

Analyzing data in qualitative research, the researcher must: (a) compile the data together, (b) disassemble the data, (c) reassemble the data, (d) interpret the meaning of the data, and (e) confirm the data (Yin, 2011). To complete a thorough analysis of my data, I used a methodological triangulation method in this single qualitative case study. Other processes used for qualitative data analysis include coding and thematic analysis. Methodological triangulation involves using multiple sources and methods to gather information (Fusch & Ness, 2015). To accomplish methodological triangulation, I used

semistructured interviews and gather archival documentation from the company I used for my study. Methodological triangulation, coding, and thematic analysis are all critical steps in the data analysis process (Rosenthal, 2016). These three areas helped me to collect, organize, and analyze data in a constructive and efficient manner.

There are various methods used to analyze data. To properly analyze data for qualitative studies, it is best to separate the data into small groups to identify pattern and themes (Yin, 2018). Developing a system to best identify themes involved setting up a coding system. For this study, I used a color-coding system to better categorize the themes I wanted to identify. These themes in color coding were organized in a Microsoft Excel Document. I began by transcribing my interviews into categories to identify the participant number, question number, and their response. I then assigned the color codes in iterations, creating a new Microsoft Excel tab for each iteration. I reviewed each participant's response and used the correlating color code to identify where in their response the theme was identified.

Once all themes were identified in a single interview transcript, I went back and related my themes to themes identified in previously reviewed research studies. This helped me to recognize what themes were similar across my research and previous research, and where I may have identified new themes in my research. I also correlated themes with my conceptual framework to show rigor in my data analysis (Yin, 2018). To aid in the accurate analysis of my data, I used a qualitative data analysis system to manage coding procedures.

Reliability and Validity

There are various factors to ensure that research is respectable. Reliability and validity are factors used in qualitative research to increase the likelihood that the research will be transferable, credible, dependable, and confirmable (Gaikwad, 2017). To increase reliability and validity in a qualitative study, researchers should ensure that they have achieved data triangulation during the collection phase and use member checking once interviews have been transcribed (Fusch & Ness, 2015). As reliability and validity relate to the rigor that a study is conducted and the quality of the findings, researchers should try to use techniques that help to contribute to improving the study (Gaikwad, 2017). Following research protocols helped to establish the appropriate amount of rigor for this study.

Reliability

Research protocols specific for qualitative studies were used to achieve reliability. Reliability relates to the level in which a study can be repeated (Gaikwad, 2017; Yin, 2014). Data triangulation and member checking can both be used to improve reliability in a study (Fusch & Ness, 2015). I achieved data triangulation by conducting semistructured interviews and reviewing company documents regarding processes and metrics used to implement strategies to achieve competitive advantage. Member checking was achieved by having research participants review a summary of their interview to ensure the information was accurate. Member checking is defined as sharing a brief summary or the whole findings with the research participant (Birt et al., 2016). Member checking and data triangulation were both used to achieve reliability in my doctoral study.

Reliability is also ensured by having dependable data. Dependability refers to the reliability of research data and the documentation of research procedures (Saunders et al., 2015). Dependability can be measured by identifying mistakes made by the researcher. Mistakes can be made in conceptualizing the study, data collection, analyzing the findings, and recording the results (Leung, 2015). To minimize mistakes, I followed data collection protocols and used coding to analyze my findings.

Validity

Validity is also an important factor in doctoral study research. Research that is transferable, confirmable, and credible helps to contribute to the validity of a study (Rosenthal, 2016). Validity can be achieved by including in-depth description of the methods and procedures used while collecting and analyzing data, which allows the reader to see how particular conclusions were made (Roberts et al., 2019). To ensure validity I used a qualitative case study design in collecting my data via interviews. This included applying data triangulation techniques by collecting data from multiple sources. Triangulation can be achieved by having a deep understating of the data set and analyzing the data utilizing qualitative methods data to contribute to the credibility and confirmability of the research (Morse, 2015). Data triangulation and member checking can also improve the validity of a study.

Achieving reliability and validity in my doctoral study helped to increase my credibility. Certain credibility strategies should be used to create a rigorous process in which to collect and analyze data for a qualitative case study (Houghton et al., 2013). To ensure credibility, I completed member checking by transcribing the interviews and

having research participants review what I have transcribed via email to authenticate the information. To achieve confirmability, I created an audit trail to accurately review research processes and activities. The reader determines transferability (Maxwell, 2021). Transferability is the ability of researchers to apply or transfer the findings of my study to similar research in the future. To ensure credibility, dependability, confirmability, and transferability in your research, strategies such as: (a) triangulation, (b) member checking, (c) creating an audit trail, and (d) giving thorough descriptions must be used (Houghton et al., 2013).

Transition and Summary

In Section 2, I described how I collected and analyzed data. This section began with a summary of my role as the researcher as well as types of participants I used to collect data for my study. In this section, I also discussed the study population and sampling process used to choose participants for this study. I provided information on data collection, instruments, and organizational techniques that I used.

I collected data via semistructured interviews and used Otter to record and transcribe these interviews. To analyze my data, I used a coding system to identify patterns and themes within my research. I used methodological triangulation during semistructured interviews and reviewing archival data to analyze data and improve reliability and validity of my research. Section 2 also included information about how I conducted ethical research and ensured that data were reliable and valid. Data triangulation and member checking were two ways to achieve reliability and validity in this qualitative research study.

In Section 3, I present findings of my research. I discuss themes I identified using my coding technique. This includes comparing my findings to findings of peer-reviewed studies. I also discuss how my findings relate to the conceptual framework used in my study. In Section 3, I also discuss how my findings can be applicable in business and improve business practices, specifically the automotive manufacturing supply industry. Implications for social change, recommendations for actions, and recommendations for further research are also discussed in this section. I conclude Section 3 with my reflections on the DBA doctoral study process, including any biases that I identified and a concluding statement to further reiterate the purpose and findings of my study.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this single qualitative case study was to explore information system strategies used by leaders in the automotive manufacturing supply chain to achieve competitive advantage. For this study, I interviewed five participants from one automotive manufacturing supply chain company in North America. Participants were business leaders with a minimum of 5 years of experience in the automotive manufacturing industry. They had extensive knowledge of supply chain practices, IT integration and implementation, customer service, and supplier relationships. To gather additional information on the organization's supply chain practices, I also reviewed archival documents which provided support for information that was collected from participants during interviews. NVivo was used to analyze interview data. In this section, I demonstrate how responses from participants and archival documentation were used to support answering the research question.

Presentation of the Findings

The overarching research question for this study was: What strategies do automotive manufacturing supply chain leaders use to integrate information systems to achieve a competitive advantage? Semistructured interviews and a review of archival documents from the participating organization were used to collect data. Documents included annual performance reports and processes related to IT systems. The following four themes were identified from interviews and related documents: building supplier partnerships, improving competitive advantage, innovative supply chain practices, information sharing to improve supply chain networks. These themes emerged by using

Yin's thematic analysis process which required separating of data into small groups in order to identify pattern and themes across the data. To keep the identity of research participants anonymous, they were identified by an alphanumeric numbering system of P1, P2, P3, P4, and P5.

Theme 1: Building Supplier Partnerships

Three participants discussed how building partnerships with other suppliers and like manufacturing companies ultimately helped improve firm performance. IT systems were identified to help improve communications between suppliers and build effective partnerships. Liu et al. (2016) argued firm performance is dependent on types of partnerships that are built within the supply chain. During the document review process, I came across a list of similar automotive manufacturing supply chain suppliers along with the names of the IT systems they used to connect with their customers and other suppliers. This list was used by the research organization to assist them in the decision-making process to determine which system they would implement to connect with suppliers in their network. These three participants also stated they saw positive impacts on firm performance, as communication was increased, and trust was built between suppliers. P1 said "Increasing communication with other like suppliers has become an important part of our supply chain management practices. It has really changed the game for how we perform in the market and compete against larger suppliers." P2 said, "For a long time it felt like we were out on an island just trying to think of new way to do business. When we really started communicating with these other companies, it felt like a whole new world of possibilities became available to us." P4 further supported this and

said, "Trusting partnerships has helped lots of companies in the industry, not just ours. Technology has been the driving factor in how quickly we are able to connect with other companies and our customers." Though the process of implementing new technology systems was not quick, as noted in documents, once the system was running and employees were trained to use it, they were able to connect with other suppliers and customers in real-time.

Huong Tran et al. (2016) asserted that a lack of trust and incompatible information systems at the different organizations are two of the most common risks that puts supply chain partnerships in jeopardy. P2 said:

> Not all automotive manufacturing suppliers have IT systems that talk well with one another. Implementing a new ERP system took our business to the next level as we were able to communicate with more innovative suppliers, and those partnerships have been extremely beneficial.

Via annual reports from the organization which were published a year prior and after implementation, performance and market positions had greatly improved. Velda and Dhiba (2017) argued that communication between suppliers fosters partnerships that include the sharing of information between organizations within a supply chain network. P4 stated, "supply chain network partnerships really helped us improve our business practices and how we manage risk. We just learned so much from the other suppliers." Zeng and Yen (2017) asserted supply chain partnerships help to improve resilience of supply chains as critical information can be shared.

Theme 2: Improving Competitive Advantage

Four participants discussed how improving competitive advantage was achieved. Operational performance and competitive advantage was achieved due to the positive impact of information and communication, technology, and supply chain management strategies. P5 stated:

> It's a tough industry to be in right now, especially with COVID. Technology has definitely helped us to maintain and improve our competitive position in the market. We have seen so many like organizations really struggle over the last couple of years.

Annual reports from the organization showed how the business was able to remain competitive during and towards the end of the COVID-19 pandemic.

Shen et al. (2022) said using IT to create innovative business practices is essential to the viability of businesses and maintaining a competitive advantage. P2 stated:

> I've been here 24 years. Technology wasn't always something we have bought in to. It is definitely a costly endeavor. I will say the last 10 to 12 years, we have been intentional about keeping our technology up to date so that we can communicate and compete with the larger suppliers. It really gives us a better competitive advantage that we didn't have prior to implementation.

Gunasekaran et al. (2017) said organizational leaders who fail to implement IT to help improve supply chain and logistics practices by increasing efficiency are unable to influence their organizations' ability to achieve competitive advantage.

P3 said:

> "Our customers have experienced the improved service we are able to provide over the last decade. Our process is more efficient and definitely makes my job easier. All the information I need is readily available, which means I can respond to the customer faster and get them the products and services they need quicker, because our lead times are now shorter.

Tolmay (2017) contended that there was a strong positive relationship between sustaining supplier relationships, improving relationships with customers, implementing sustainable processes, and the ability to achieve competitive advantage. P4 said, "our company has seen great gains in the last 8 or 9 years. We are not the biggest automotive supplier, but we are definitely one of the best.

Theme 3: Innovative Supply Chain Practices

In my findings three of the research participants discussed how innovation helped to improve supply chain practices P1 stated "In this market you have no choice but to have an innovative supply chain. Big name automotive companies will only work with the best of the best suppliers." Ruivo et al. (2016) showed that implementing innovative information systems can help to improve supply chain management performance in manufacturing and services SMEs, which allow an organization to achieve and sustain competitive advantage. P2 stated, "Innovation and technology go hand in hand. To be innovative you have to have a technological aspect in everything you do. From communicating with customers and other suppliers to moving products through the supply chain."

Kawk et al., (2018) asserted technology driven processes, practices, products, and services create an innovative supply chain needed to address customer problems, meet demands, and improve competitive advantage. P5 stated:

> COVID made it extremely difficult to implement new innovative processes. We lacked the human resources needed to keep those concepts moving forward to improve our supply chain practices but are slowly getting back to where we were as we adjust to this new normal.

Othman et al. (2018) affirmed innovation is an ideal concept, implementing and attaining innovative processes and resources is not always easy. Artsiomchyk and Zhivitskaya (2015) who argued that the human factor is the main resource needed for the implementation of innovative strategies.

Theme 4: Information Sharing to improve Supply Chain Networks

All five participants stressed the importance of information sharing between suppliers to help improve efficiency in supply chain networks. P1 stated "We use an EDI system to communicate across our supply chain network, the sharing of information is essential to the growth of our business." In the archival process documentation, it was outlined how the EDI system would help to improve communication not only within the supply chain network, but within the organization. Zhang et al. (2018) shared, knowledge integration and flow has greatly impacted competitive advantage of a supply chain network by improving communications between suppliers. P2 stated:

> Having newer information technology systems has given us a seat at the

> table, meaning that we can share our innovative practices with other suppliers, and they can do the same with us. All of these improvements help to positively impact how we do business with our customers as well.

Kremljak and Kafol (2015) proved that by increasing communications between agents involved in purchasing planning, scheduling, logistics, and quality by using information sharing technology, helped to improve the manufacturing organization's competitive advantage and responsiveness to an ever-changing market in this multi-literature survey.

P5 stated:

> We achieved a new level of market position by using our advanced technology systems to communicate within the supply chain network. The things we have learned to advance our business and competitive advantage have allowed us to thrive even in a Covid stressed manufacturing industry and supply chain.

Kremljak and Kagol (2015) asserted that information sharing through IT improved the manufacturing organizations competitive advantage and responsiveness to an ever-changing market, by increasing communications between agents involved in purchasing planning, scheduling, logistics, and quality. P4 said "I appreciate our intentionality behind making improvements to our IT systems. For me, the relationships that it has allowed us to create with our customers and other suppliers have been a huge benefit to the business."

P3 said:

> Improved efficiency was our goal with implementing a system that allowed us to communicate across our supply chain network. There was so much information

we were missing out on before we started to build and foster those partnerships. Velda and Dhiba (2017) determined communication between suppliers fosters partnerships that involve the sharing of information between organizations within a supply chain network. Busse et al. (2016) asserted IT systems help to process information more efficiently leading to an increase in transparency, information sharing, and partnerships among suppliers. Sharing information and building partnerships require trust amongst suppliers in a network. Piderit and Flowerday (2014) stressed the importance of organizations building trust with other organizations to use information sharing to increase competitiveness. Findings of this study indicate that information sharing among suppliers helps to enhance business relationships and overall efficiency of the supply chain network. My findings align with the research and findings of published authors in the literature review.

Relevance to Conceptual Framework

The RBV theory was used to evaluate an organization's ability to use IT as a resource to increase business value. Both internal and external resources are needed to achieve competitive advantage in automotive manufacturing supply chains. Ruvio et al. (2016) said information systems can only be beneficial to organizations if they use them to their full potential. Findings of this study show how IT helps to improve supply chain practices, making them more efficient for other suppliers and customers. IT also helps to increase communication amongst suppliers in a supply chain network which allows

organizations to build partnership and share information that is potentially beneficial for all organizations within the network.

Applications to Professional Practice

Findings of this study may contribute to strategies that leaders in the automotive manufacturing supply chain use to gain competitive advantage. The strategies that assisted in the success of these leaders were implementing innovative technology systems, building partnerships within a supply chain network, and sharing information with other suppliers. Findings suggest that leaders should leverage their internal and external resources when making decisions on new practices to implement to improve firm and supply chain performance. Investing in IT to manage the supply chain is an effective solution to gaining competitive advantages in the market (Nguyen & Hoang, 2022). This study adds to current literature where the implementation and use of IT was a tool used across many industries and organizations to improve success and efficiency in a supply chain.

Although the organization used in this study was in the automotive manufacturing industry, the findings and literature around strategies used to improve supply chains and competitive advantage suggest that leaders in other supply chain industries may also benefit from the findings. IT is a strong contributing factor to the success of many companies. Several studies suggest that IT plays a vital role in supply chain practices. Bilgihan and Wang (2016) asserted that IT not only assists in the creation of competitive advantage, but also helps to reduce operational costs and improve operational efficiency. The reduction in costs and increased efficiency helps to strengthen logistics process and

communications with customers and suppliers. Technology driven processes, practices, products, and services created an innovative supply chain needed to address customer problems, meet demands, and improve competitive advantage (Kwak et al., 2018). This study contributes to professional practices as leaders across multiple industries can all use findings as guidance to sustain supplier relationships, implement sustainable practices, and improve relationships with customers.

Implications for Social Change

This study will contribute to social change by offering supply chain management processes that help to improve costs and operating efficiency. These sustainable practices allow for organizations to not only gain competitive advantage in their market but allow for longevity of business with their customers and suppliers. Sustaining a competitive advantage is critical to the success of an organization which was evident through the continued success of the researched organization, especially during COVID-19, when supply chains across the world were dismantled. It can be said that leaders in supply chain organizations who implement the same or similar business practices contribute to positive social change by providing employment opportunities within their organizations that help to strengthen their communities. Additionally, a more efficient supply chain allows for better services to customers and lower transactional costs to suppliers.

Recommendations for Action

Supply chain leaders who participated in this study were able to provide expert insights on the practices and processes of their organization that attributed to their continued success. The strategies they discussed focused on efficiency, innovation, and

partnerships, as well, as risks, evaluation of resources, and implementation of new technology. Other business leaders who are looking for ways to improve their organizations business practices to obtain and maintain a competitive advantage can do so by assessing their organizations' current resources to determine how they can expand on what they already have. Business leaders must also determine the organizations financial and human capacity to implement new technology systems. They should also lead the implementation process and be prepared to be flexible in the decision making. Lastly, business leaders should connect with similar organizations to see what ways both organizations can work together to improve their supply chain network.

Findings of this study along with these recommendations may be submitted for publication in a peer-reviewed journal and shared with the organization.

Recommendations for Further Research

This study did not allow me to collect strategies from leaders across multiple organizations. An opportunity for future research would be to conduct interviews with leaders across multiple like-organizations to assess the variation in business practices that allowed for their organizations to be successful in achieving competitive advantage. Another limitation of this study was the number of participants who were able to be interviewed, as it gave a smaller data set to identify themes and strategies, which may have been helpful in providing additional insights. Each participant shared their professional experiences with implementing new technology systems, developing relationships with suppliers, and improving supply chain practices to improve customer

service. In future research, additional correlations and themes among participants could be identified.

Reflections

Reflecting on this process has allowed me to appreciate the overall knowledge I have gained in pursing my Doctor of Business Administration degree. This knowledge has positively impacted both my personal and professional life. This process has not been easy. I never presumed it to be easy, but my approach to completing the DBA doctoral study process has changed from when I started until now completing the study. I have learned to adapt to things both in and out of my control.

When I began, I thought it was the best time to start my doctoral academic journey, but I quickly learned that there is no best time. Life will continue to happen, while you are trying to stay focused on furthering your education. Those unexpected moments in life have guided how I have approached the DBA writing process, which has fluctuated quite a bit over the years. There were many things that were out of my control that caused me to have to pivot in how I participated in class discussions, collected my research, and managed my time. This process has been one of the greatest life lessons.

Conclusion

In this single qualitative case study, five leaders in the automotive manufacturing supply chain industry shared their experiences of strategies that were used to support their organizations in gaining competitive advantage through the use of innovative IT systems. With innovative technology systems and practices being developed year over year, supply chains continue to improve in efficiency. IT promotes collaboration and data

sharing between suppliers that allow for real time changes in the market to be identified. In turn, efficient supply chains offer faster lead-times for products and services, improve communication between customers and suppliers, and lower operational costs. Leaders who can leverage their internal and external resources have seen improved success rates in attaining and sustain competitive advantage within their organization over the years and through the COVID-19 pandemic.

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Appendix A: Interview Protocol

I. Introduce self to the participant(s).

II. Present consent form, go over contents, answer questions and concerns of participant(s).

III. Give participant copy of consent form.

IV. Turn on the audio recording device.

V. Begin interview with question #1; follow through to the final question.

VI. Follow up with additional questions and collect company documents.

VII. End interview sequence; discuss member checking with participant(s).

VIII. Thank the participant(s) for their part in the study. Reiterate contact numbers for follow up questions and concerns from participants.

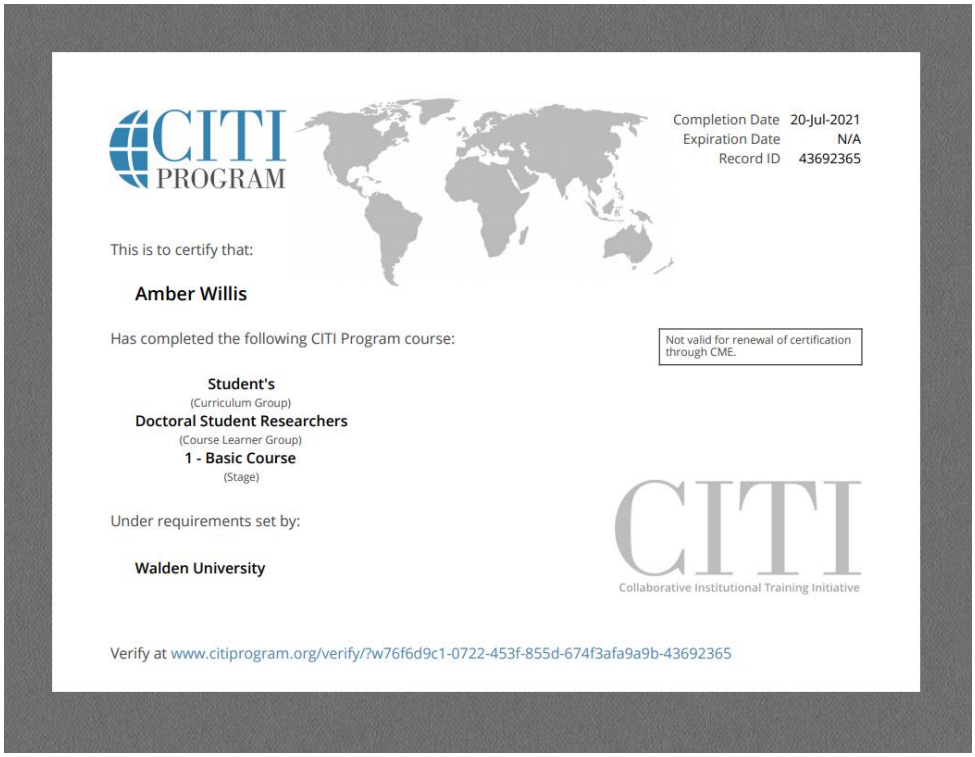
IX. IX. End protocol.

Appendix B: Interview Questions

To gain a comprehensive understanding of the strategies used by automotive manufacturing supply chain leaders to integrate information systems to achieve competitive advantage, I will be asking the following questions:

1. How do you define your global supply chain and identify where information systems will add the most value?
2. What strategies and processes does your organization use to evaluate and select information to create a competitive advantage?
3. What aspects of the supply chain processes do your strategies and processes prioritize for integration of information systems?
4. What processes are in place to achieve and sustain integration of new information systems?
5. Based upon your organization's experiences, how does integration of information systems drive competitive advantage at your firm?
6. What were the key challenges to implementing your organization's strategies for information system adoption?
7. What resources do you deploy across your supply chain to enable use of the information systems you use?
8. What additional information would you like to share that will help improve the understanding of the strategies used by automotive manufacturing supply chain leaders to integrate information systems to achieve competitive advantage?

Appendix C: CITI Training Certificate



CITI PROGRAM

Completion Date 20-Jul-2021
Expiration Date N/A
Record ID 43692365

This is to certify that:

Amber Willis

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Student's
(Curriculum Group)
Doctoral Student Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Walden University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w76f6d9c1-0722-453f-855d-674f3afa9a9b-43692365

Appendix D: Invitational Email

Dear Invitee,

My name is Amber Willis, and I am a doctoral student at Walden University. I am currently pursuing my Doctor of Business Administration degree with a concentration in Global Supply Chain Management. I am kindly requesting your participation in a doctoral research study that I am conducting titled: Strategies to Increase Competitive Advantage in the Automotive Manufacturing Supply Chain. The purpose of this study is to identify the best strategies for leaders in the automotive manufacturing supply chain to help their company become more competitive in their market.

This study involves one virtual interview for approximately one hour, where we will discuss your experience in this industry along with your involvement in implementing strategies to help your organization improve their competitive advantage in the automotive manufacturing industry. Participation is completely voluntary, and you may withdraw from the study at any time. The study is completely anonymous; therefore, it does not require you to provide your name or any other identifying information.

If you would like to participate in the study, please read the Informed Consent letter attached in this email, sign, and return to me at your earliest convenience. Please then let me know what days and times will work best for you to meet either virtually or in person over the next couple of weeks.

Your participation in the research will help like organizations develop strategies for sustaining competitive advantage by offering supply chain management processes that

improve costs and operating efficiency, which can help organizations provide sustainable employment opportunities for their communities.

Thank you for your time and participation.

Sincerely,

Amber Willis, MBA
Doctoral Student, Walden University