

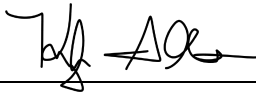
Strategic Management: Embracing New Technologies



UNIVERSITY OF WISCONSIN, PLATTEVILLE

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The attached educational project, by CHRISTOPHER MATTHEW WILSON, entitled STRATEGIC MANAGEMENT: EMBRACING NEW TECHNOLOGIES when completed, is to be submitted to the Graduate Faculty of the University of Wisconsin-Platteville in partial fulfillment of the requirements for the (MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT) degree.

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By

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**Abstract**

This seminar research paper will focus on the urgent need to collectively improve global supply chain resiliency because of COVID-19 global supply chain disruptions. The main topics that closely correspond to collectively improving global supply chain resiliency are strategy, international commerce, globalization, disruptions, technology, and management. Firm leaders and managers need not only to acknowledge that twenty-first-century globalization and global supply chain disruptions are real, they need to collaborate with each other and carry out action. The research and conclusions conducted throughout this paper will elaborate on why embracing new technologies is important for the future of international commerce and how strategic management is necessary to improve global supply chain resiliency.

**Table of Contents**

Section 1: Introduction.....5  
    Problem Statement .....5  
    Purpose of the Study .....6  
    Study Significance .....7

Section 2: Literature Review .....8

Section 3: Methodology .....13

Section 4: Discussion and Conclusions .....17

Section 5: Recommendations and Implications .....21

## **Introduction**

### **Problem Statement**

Ever since COVID initiated in 2020, barely any business has been immune to global supply disruptions (Eastwood, 2022). Gebhardt et al., (2022) state COVID-19 revealed global supply chains' vulnerability, and because of this, firm leaders and managers worldwide debate the importance of improving global supply chain resiliency. Ivanov and Dolgui, (2020) expound the coronavirus outbreak tested the twenty-first-century global supply chain resiliency, and because it manifested drastic disruption effects on all economies, it clearly reveals that the modern global supply chain very much needs resiliency improvement.

Grzybowska and Stachowiak (2022) advocate the current situation means the global supply chain is in danger, and firms unable to mitigate COVID-19 disruptions risk failure. El Baz and Ruel (2021) specify in supply chain management, resilience is defined as the ability of an enterprise or set of firms to respond to an unexpected disruption and then restore operations to normal. Professor Rice (2022) suggest organizations should not individually focus their efforts on preparing themselves for the next pandemic or disruption, they should collectively build supply chain resiliency to protect against any threat.

Despite that Professor Rice has just presented a wonderful idea, it cannot be expected that firm leaders and managers can promptly come together to collectively improve global supply chain resiliency because the disruptions brought by COVID-19 present global firms with an uncertain environment (Antonio et al., 2022). Only something universal and with remarkable capabilities could coalesce global firm leaders and managers to pursue improving global supply chain resiliency promptly and collectively. Spieske and Birkel (2022) propose Industry 4.0 (4IR) technologies enable competing firms to mitigate the risk of global supply chain disruption, and

these technologies are the key to improving global supply chain resiliency. Hsu et al., (2022) state the Industry 4.0 technologies essential for the modern global supply chain are Artificial Intelligence (AI), Big Data Analytics (BDA), Blockchain (BC), Cloud Computing (CC), Cyber-Physical Systems (CPS), the Internet of Things (IoT), Machine Learning (ML), Industrial Robotics (IR), and Simulation Techniques (ST).

### **Purpose of the Study**

This research study has three main purposes. The first main purpose of this study is to assess how COVID-19 disruptions influenced the critical need for improving global supply chain resiliency. Berbés-Blázquez et al., (2022) exemplify that the COVID-19 pandemic is the most influential event of the twenty-first century and it presents an unusual opportunity to examine the urgent need to improve global supply chain resiliency. The global supply chain impacts and externalities brought on by COVID-19 will therefore be thoroughly analyzed and discussed throughout this research study.

The second main purpose of this study is to inspire global firm leaders and managers to pursue 4IR technologies promptly and collectively to improve global supply chain resiliency. Qadar et al., (2022) suggest management professionals at competing firms should work together to build global supply chain resiliency for effective supply chain (SC) performance. Comparisons between firms that have begun using 4IR technologies will therefore be made against firms that have not yet embraced the use of 4IR technologies because 4IR technologies are universal worldwide and in this research study they are proposed to be the key to improving global supply chain resiliency.

The third main purpose of this research study is to encourage more global market competition because it augments international commerce and supports the collective goal of

improving global supply chain resiliency (Shambaugh et al., 2018). Alasadi (2021) advocates competition pushes competitors to adopt revolutionary technology, seize global consumer demand opportunities, and avoid future business challenges. This research study focuses more on a qualitative approach over a quantitative approach because the global supply chain disruptions brought on by COVID-19 have had a larger impact on some firms and sectors than on others (Anayi et al., 2021).

### **Study Significance**

This research has great significance for the following three reasons. The first reason is that this seminar research paper begins by identifying a modern global supply chain issue and explains how this issue creates a corresponding objective for competing international firms. Next, this seminar research paper compels global firm leaders and managers to exemplify strategic management to achieve this collective objective. Tucci (2017) delineates that strategic management is the open-ended planning, monitoring, analysis, and assessment of all the requirements an organization needs to meet its objectives and global market changes will necessitate competing international businesses to constantly assess their strategies for success.

Clarke and Fuller (2010) substantiate that strategic management strongly emphasizes collaboration and this is essential for global firms in the twenty-first century because it addresses complex, social, and widespread problems that exceed the operational management capacity of any single organization. The second reason this research has great significance is because this seminar research paper focuses on collectively embracing new technologies while augmenting international commerce. Tortorella et al., (2022) state embracing 4IR technologies sooner rather than later is of high importance to global firms because twenty-first-century globalization has vastly increased the interrelationship between supply chains (SCs), bringing buyers, suppliers,

customers, partners, distributors, manufacturers, and retailers so close together that they have become tightly coupled agents. Author Millar (2015) advocates that those business leaders and managers courageous enough to embrace new technologies will be those most prepared for unanticipated supply chain disruptions and twenty-first-century globalization.

The third reason this research has great significance is that it confirms how 4IR technologies will improve global supply chain resiliency. This research study aims to make as many businesses as possible in the global market immune to future supply chain disruptions. 4IR technologies possess the capability to improve global supply chain resiliency because they reduce uncertainty, enhance visibility, eliminate redundancies, advance information and knowledge sharing, strengthen freight and data security, increase agility and velocity, encourage collaboration, elevate situation awareness, generate greater flexibility, and ultimately mitigate disruption risk (Marinagi et al., 2023).

### **Literature Review**

Chowdhury et al., (2021) declare that the massive worldwide supply chain disruptions brought on by COVID-19 have elevated much assessment and research regarding the need to improve global supply chain resiliency. Goel et al., (2021) remark that global supply chain resiliency is not a new topic, it has attracted much-renewed attention because of COVID-19 disruptions. Swanson and Suzuki (2020) elucidate that many industries have been hindered by COVID-19 disruptions, but these are really new and unique challenges, letting us know how crucial the need to improve global supply chain resiliency actually is.

COVID-19 tells us that firms need to adapt to twenty-first-century globalization if they wish to succeed (McCausland, 2020). Twenty-first-century globalization strongly implies economies are going to work together worldwide and 4IR technologies can greatly support this



endeavor (Botlík, 2020). COVID-19 started in one country, but it had extensive spillover effects worldwide, pressing firms to deal with tremendous supply shortages and very large demand spikes (Craighead et al., 2020). Some firm leaders and managers continue to place responsibility on COVID-19 for global SC issues years after the disruption had begun, but this does not exemplify strategic management, therefore this seminar paper will next inspect conventional firm strategies before COVID-19 initiated worldwide.

Raj et al., (2022) describe that before COVID-19 arose and spread worldwide in 2020, most business leaders and managers typically focused on just-in-time inventory management and this approach worked well for many firms, but this approach could not combat a worldwide disruption and hence challenged several firm leaders and managers to rethink their SC strategies. Nikookar and Yanadori (2022) comment COVID-19 mandates that global firms can no longer compete duly on the prevalent factors of high quality, low costs, or short delivery times, the ability to effectively respond to global supply disruptions has become indispensable. The people held responsible for business actions are firm leaders and managers, and they have been questioned about what to do regarding the disruptions brought on by COVID-19.

Das et al., (2022) witness that IBM conducted an enormous survey in 2020 spanning more than three-thousand executives from twenty-two industries in twenty countries, and the need for better initiatives with regard to the use of technology in the global supply chain was admitted. This 2020 survey is highly informative but it did not specify what technology or technologies should be used. Ralston and Blackhurst (2020) offer that 4IR technologies are ideal because they get rid of the dependence multi-national firms have on people working amidst enterprises and instead build resiliency through automated firm and supply chain processes. Farooq et al., (2021)

substantiate that several recent studies agree that 4IR technologies possess the capability to make SCs more interconnected to combat future disruptions and improve global supply chain resiliency.

As 4IR technologies are relatively new and have not yet been used by all firms, their investment costs, commitments, and strategic applications must be considered on all levels. Zhen et al., (2020) argue 4IR technologies require strong commitment by firm leaders and managers and they are surely an expensive investment, but they gather and integrate data for firms swiftly and this escalates knowledge for improving decision-making processes and helps to mitigate future disruption risk. This argument strongly advocates that 4IR technologies are strategic for global enterprises, but it does not fully explain why some firm leaders and managers would be reluctant to embrace these technologies.

Bianco et al., (2023) contend firm leaders and managers are not entirely aware of how 4IR technologies can support companies with improving global supply resiliency and how they are able to prevent future disruptions. Eslami et al., (2023) mention that some firm leaders and managers are apprehensive to embrace 4IR technologies because of perceived financial justifications, such as unclear break-even points and amortization periods. 4IR technologies also require firm employees to learn new skills and competencies from industry practitioners and training is an additional expense for some firms (Ito et al., 2021). A couple of other issues that concern some firm managers and leaders regarding embracing 4IR technologies are human safety and inappropriate data use (Berrah et al., 2021).

Investment costs, unclear financial meanings, employee training expenses, safety issues, and inappropriate data use may steer some firm leaders and managers away from embracing 4IR technologies, but firms that have limited resources are not without hope. Yang and Gu, (2021) state that many European Union (EU) governments are funding 4IR technologies because they

have strategic roles, overcoming energy and mobility challenges to yield integrated community solutions. Whether firms have the resources or not to embrace 4IR technologies, it can be assumed that most firms will use these technologies selfishly, that is, for individual firm gain. 4IR technologies can service different business applications, but this assumption will be justified as false because of twenty-first-century globalization.

Raji et al., (2021) assert that twenty-first-century globalization significantly elevates the need for competing global firms to augment and connect their internal advancement process mechanisms with external customers and suppliers to maintain a competitive edge. Many implications have been made throughout this seminar research paper assuring that 4IR technologies will encourage and intensify firm competition on a global scale. A connection can therefore be made relating to how 4IR technologies connect twenty-first-century globalization, COVID-19 impacts, strategic management, and improving global supply chain resiliency together.

4IR technologies present solutions in real-time that eliminate the bottlenecks of globalization complexity and COVID-19 uncertainty, making them excellent tools to overcome future disruptions and improve global supply chain resiliency (Li et al., 2022). More specific 4IR technology implications have been made that further substantiate this claim. Naz et al., (2022) convey it is strategic for firm managers to embrace ML because it promptly organizes thousands of tasks while managing project resources. Khan et al., (2023) observe that IoT tools better monitor and track cargo movements between parties for visibility enhancement, and these tools also possess the capability to eliminate redundancies by optimizing warehouse spacing arrangements.

Kaur et al., (2022) examine that CC tools can store perishable product-specific details electronically ensuring they are not spoiled and they are able to immediately inform associated parties if an unanticipated event such as a weather disruption occurs. Lohmer et al., (2020) present

that BC is a wondrous 4IR technology, it enables a transparent, secure, and timely data exchange and automation by way of smart contracts. Kaikova et al., (2022) advocate that AI can make more logical decisions than humans and is hence strategic for businesses. These statements may convince firm leaders and managers 4IR technologies are highly strategic, but their impacts on conventional SCM strategies are not specified.

Vinodh et al., (2021) declare that CPS technologies are a promising tool for making the global SC more agile, they greatly enhance specific industry applications by extending existing lean systems to different production systems. Bhat et al., (2021) substantiate that 4IR technologies recognize Lean thinking as their primary catalyst, they concentrate on waste elimination and Six Sigma methodology to reduce variation and therefore establish robust technology. Stuart (2020) realizes that 4IR technologies enhance Kaizen philosophies by digitizing them, encouraging diverse teams to collectively embrace these methods and practices to a greater extent.

This seminar research paper does not encourage firm leaders and managers to abandon or forget conventional SCM strategies, it compels them to revise their strategies by embracing 4IR technologies to promote greater global market competition, pursue twenty-first-century globalization, and ultimately improve global supply chain resiliency. Müller et al., (2021) substantiate that embracing new technologies often requires management professionals to incorporate new external knowledge into internal activities, which means amending business models. Abdullah et al., (2022) corroborate that firm leaders and managers certainly have the incentive to embrace 4IR technologies, they serve as assets to enterprises containing strategically competitive elements that allow firms to distinguish themselves from competitors.

Essentially, 4IR technologies are a worldwide digital transformation proposed to increase SC agility and flexibility, reduce production and labor costs, and increase firm output and return

on investment (Grabowska and Saniuk, 2022). This seminar research paper anticipates that many firm leaders and managers will soon embrace 4IR technologies because of their many prospective benefits. Ejsmont et al., (2020) observe that twenty-first-century globalization trends increase the need for 4IR technologies and practitioners are very confident about the new advantages these technologies offer.

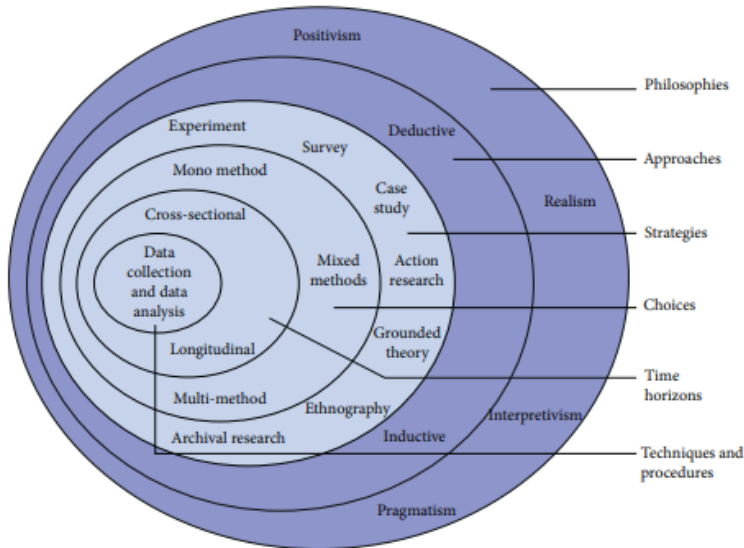
It can be expected that 4IR technologies will change business environments and firm employees accustomed to traditional business settings will resist the changes these new technologies bring. Stacho et al., (2021) state that to optimally mitigate any anticipated employee resistance, firm leaders and managers need to understand 4IR technologies to the best of their ability and enthusiastically embrace them. Endrejat et al., (2021) note that businesses in the twenty-first century must have an adaptable workforce with employees that are willing to respond quickly to a changing environment. This seminar research paper therefore strongly implies that to fully exhibit strategic management, firm leaders and managers must embrace 4IR technologies with the highest ambition.

### **Methodology**

The framework methodology used in this study was the research onion such that broad approaches were not used, bias was mitigated, and credibility was properly established. Professors Phair and Warren (2021) state that the research onion model is an excellent and very powerful tool delineating how and why the data selected throughout a research paper demonstrated consistency with apt justification. Figure 1 below depicts a research onion model and this provides mapping guidance to readers on the methodological steps that were used in this seminar research paper.

#### **Figure 1**

*The Research Onion Model*



*Note:* This image was produced by Ryan Alturki in 2021 to depict the research onion and its steps. From “Research Onion for Smart IoT-Enabled Mobile Applications,” by R. Alturki., 2021 *Scientific Programming*, 1-9, p.2 (<https://doi.org/10.1155/2021/4270998>). Copyright 2021 by Ryan Alturki.

On account that many different things could have been said about the topics presented in this study, the impacts brought on by COVID-19, twenty-first-century globalization, 4IR technologies, market competition, and strategic management the pragmatic philosophical method was ideal when correlating and corresponding how these things were connected such that a specific research topic was formulated. This is because the pragmatic philosophical approach is a paradigm based on the premise of utilizing the best methods to examine a real-world problem, it allows for multiple sources of knowledge and data to be collected and incorporated together such that a research topic and its solution are jointly created together with a forceful rationale (Allemang et al., 2022). The pragmatism research philosophy only accepts concepts to be relevant if they support

action and this is how the purposes of this study and its significance intertwined together and informed readers on what can be done to improve global SC resiliency (Kaushik and Walsh, 2019).

This research study was written in 2023, three years after the global outbreak of COVID-19 started and at a time when 4IR technologies were relatively new. It was therefore highly suitable for this research study to proceed with the inductive methodology approach because this established how noteworthy summary findings from various sources were linked together in such a way they were organized and presented to readers with clarity (Thomas, 2006). Qualitative research that focused on textual data was retrieved when limited insights were available and this information was incorporated together to further the campaign this research study strongly pursued to provide readers, the urgent need to improve global SC resiliency (Melnikovas, 2018).

Then came strategy selection. The strategy used throughout this seminar research paper was action research because it called for some kind of intervention to occur, sought insights that were believed to benefit readers, and made intervention occurrence impacts that were anticipated to inspire fellow researchers to study associated topics to a greater extent (Phair and Warren, 2021). The thesis presented in this research study advocates that 4IR technologies can improve global SC resiliency because of their unique capabilities and this was the catalyst calling enterprise leaders and managers worldwide to action.

The research choice used in this study was the mono-method. This research choice method best suited the thesis presented in this study because it avoided ambiguity and negated using broader research perspectives (Azorín and Cameron, 2010). The time horizon section of the research onion came next and the cross-sectional approach was selected. This approach was appropriate for this seminar research paper because it allowed for data to be collected from many

different qualitatively-formatted sources at a single point in time and that was 2023 (Thomas, 2023).

Lastly, came the most critical part of the research onion, its core. This final step culminated all the techniques and procedures that were used to constitute the framework methodology used in this research study. Peer-reviewed journals were the dominant source method used throughout this research study because they go through an extremely rigorous review process and this ensures that only data of superlative quality has been published (Steer and Ernst, 2021). A minute volume of sources that were not peer-reviewed journals was dispersed throughout this research study because they pointed out notable findings and this specific data led to and encompassed its thesis. This research study assures readers that these credentials are from reputable sources and they certainly are listed in its References section.

The inclusive criteria this research study had was that mainly data from 2020 onward was used. The reason for this is that COVID-19 was not identified as a worldwide SC disruption until 2020 (Eastwood, 2022). A select few sources released prior to 2020 were used in this research study's Introduction and Methodology because they validated term definitions and immensely supported the associated topics that constructed its thesis. Strictly no data prior to 2020 was presented in this research study's Literature Review.

The exclusive criteria used for this seminar research paper were as follows. No specific financial information was provided because this type of data was quantitatively formatted and this study selected the mono-method research choice, with a focus on qualitative information. No specific enterprise impact brought on by COVID-19 was stated because that information varies by industry (Anayi et al., 2021). No specific statistic was listed or described by an individual country



because the impacts brought on by COVID-19 affected the economies of different nations in varied magnitudes (Yang and Gu, 2021).

To comprehensively describe and ultimately justify the data techniques used in this study, a brief reiteration of the steps taken to complete the research onion framework methodology has been made for readers in this paragraph. This research study started with a pragmatic philosophical approach that led to the use of inductive methodology techniques. These techniques strategized action research that resulted in qualitative data analysis from mainly peer-reviewed journals predominantly published between 2020 to 2023. The recurring and relevant themes and ideas presented in those particular peer-reviewed journals were then integrated and used meticulously throughout this research study such that its thesis and solution were jointly presented to readers.

### **Discussion and Conclusions**

In early 2020, an unprecedented event occurred and brought many SC disruptions to contrasting traders, firms, and economies worldwide. This event has been globally recognized in magnitude as COVID-19, but its effects vary between competing industries and the SCs connecting them, hence creating the need for research to identify and propose a solution to newly presented issues (Hald and Coslugeanu, 2022). The research conducted in this study identified that the many disruptions brought on by COVID-19 created an urgent need to improve global SC resiliency and it is possible to do this by strategically embracing 4IR technologies.

Some of the different ways other examinations discuss how global SC resiliency can be improved include pursuing new electronic measures to better manage inventory, knowledge and data sharing, and integrating software, but this research study observes that technology is the keyword used the most across multiple sources, meaning that it is essential for reform (Das et al., 2022). Pooling data from several different sources, this research study respects and acknowledges

the ideas and suggestions presented by other sources on how to improve global SC resiliency but has established an immensely strong correlation that 4IR technologies should be used to improve global SC resiliency because they consider a wider range of logistics functions and are more comprehensive with business activities (Farooq et al., 2021).

4IR technologies in this research study and others like it have been titled with this name because they possess the capability of revolutionizing the global SC, they could get rid of the dependence multi-national firms have on people working amidst enterprises and are likely to build resiliency by automating firm and supply chain processes (Ralston and Blackhurst 2020). Whether global enterprise leaders and managers were unaware of twenty-first-century globalization or deliberately ignored its trends has become redundant in 2023. This is because COVID-19 disruptions demonstrate that adapting to twenty-first-century globalization is essential (McCausland, 2020).

Twenty-first-century globalization presents itself as a perplexing topic to many and thus can be pursued in different ways, but 4IR technologies are proposed as ideal for worldwide enterprises because they present solutions in real-time that eliminate the bottlenecks of globalization complexity and COVID-19 uncertainty, (Li et al., 2022). The implications made throughout this research study suggest that 4IR technologies will support twenty-first-century globalization and improve global SC resiliency while significantly augmenting international commerce. The findings that challenge what 4IR technologies may do for competing organizations across the global SC are limited research data, employee resistance, high costs, and commitment issues.

The research conducted in this study took place in 2023, a time when 4IR technologies were new and unfamiliar to many businesses and persons. Nevertheless, some organizations

started using 4IR technologies before 2023 and a few have even started using them prior to the COVID-19 outbreak in 2020. There were a few sources published prior to the COVID-19 outbreak in 2020 that discussed 4IR technologies, but to mitigate bias, this research study did not use them because it assumed that data was applied to firm-specific purposes.

The data used from 2020 to 2023 in the research study's Literature Review represented what specific 4IR technologies are capable of doing without bias, but it did not state which specific technology is optimal or most beneficial to a particular firm. 4IR technologies possess distinctively unique capabilities that let global enterprises use them for firm-specific goals, cooperative pursuits between partners, subsidiaries, alliances, or collective endeavors. This research study aims at influencing enterprise leaders and managers worldwide to pursue 4IR technologies as a collective endeavor to improve global SC resiliency, but the following limitations about them must be acknowledged.

4IR technologies can be used selfishly and firms may not be obligated to share them with others. This is not necessarily a bad thing because 4IR technologies encourage innovation and this would theoretically heighten market competition and augment international commerce (Shambaugh, 2018). This means that whether firms with 4IR technologies chose to share them or not, global SC resiliency would improve. 4IR technologies demonstrate capabilities able to overcome complex global SC issues and the disruptions COVID-19 brought worldwide. These two things are collectively pressuring global firm leaders and managers to take action. It would therefore make more sense for 4IR technologies to be shared rather than not because the faster they are put to work, the faster global firms would be able to adapt to twenty-first-century globalization and proceed with their business endeavors without further interruptions.

It can be expected that 4IR technologies would drastically change work environments for several organizations worldwide. 4IR technologies may discomfort and cause additional work efforts for some people at first, and it is not out of the question that some jobs could be replaced by these technologies. This limitation is not as bad as many people may think because resistance to change can be anticipated with anything new and 4IR technologies would theoretically augment the global economy in such a way more modern and higher-paying jobs might become available. Additionally, 4IR technologies may allow some individuals to work from home part-time and have multiple jobs such that these persons receive supplemental incomes.

Statistical interfaces could not have been used to elaborate on the high costs or explain the commitment issues 4IR technologies present to some global firm leaders and managers because this is a qualitative study and that information varies widely. However, this research study encourages fellow researchers to gather quantitative data on how expensive 4IR technologies may be to embrace and how long they take to make break-even points or generate profits for a firm. That information could very well provide global firm leaders and managers not yet embracing 4IR technologies with an idea of how costly they would be for their organization and what kind of commitment they could expect.

Despite having to specifically use a three-year time period when limited data was available regarding 4IR technologies, this research study did have tremendous success correlating and corresponding their relevancy to COVID-19 disruptions, twenty-first-century globalization, international commerce, and strategic management. COVID-19 is quite possibly the most influential event of the twenty-first century and has made global enterprise leaders and managers aware that no single firm can mitigate SC disruptions by itself. With their distinctively unique capabilities, 4IR technologies presumably are essential to improving global SC resiliency.

### **Recommendations and Implications**

This research study greatly aspires that persons interested in SCM seek deeper insights into 4IR technologies. Global enterprise teams require a better understanding of 4IR technologies such that they can be embraced with collective enthusiasm and not apprehension. Experimentation with 4IR technologies is highly encouraged such that more conclusive remarks about them can be made and any prospective deficiencies or flaws they may have can be eliminated. Future studies should examine 4IR technologies from all perspectives and environments feasible. Doing this would allow for the distinctly unique capabilities these technologies have to be understood in different settings or functions.

Further research on how 4IR technologies can be integrated with conventional business and SC strategies is recommended. This would help global enterprise leaders and managers better align firm-specific objectives with the needs of external parties. 4IR technologies could drastically change business environments and this implies that some firms may have to change how they conduct themselves. Business codes and clauses may have to be rewritten or amended when embracing 4IR technologies, therefore global firm leaders and managers should consult human resource and legal professionals about what changes to expect and the best ways to go about them.

It is highly recommended that organizations with 4IR technologies share them. Doing this could yield different outcomes in contrasting environments and influence more people to embrace 4IR technologies. Training videos on how to use 4IR technologies should be posted online. This would reduce the costs of having to pay industry practitioners to educate people on how to use them and it would help alleviate the anxious implications some people have that these things may be too complicated to be self-taught.

Further research on 4IR technologies is needed to fully explain to international traders their environmental effects. Most 4IR technologies have been marketed as being very environmentally friendly, but some of them do not advertise or present themselves this way. Greater insights on how environmentally conscious 4IR technologies are should be taken from all perspectives. This ties in closely with 4IR technology experimentation. Theoretically, the more data there is on 4IR technologies, the more willing global enterprise leaders and managers would be to embrace them.

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