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Mitigation Strategies of Technostress on Supply Chain Management

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Abstract

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MS, American Military University, 2010

BS, Saint Louis University, 1994

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Logistics managers work to create practices that reduce technostress, which is associated with diminished productivity in supply chain management. The purpose of this multiple case study was to explore the mitigation strategies that logistics managers at distribution centers used to reduce technostress with their employees in the Los Angeles County, California area. The conceptual framework included in this study was the sociotechnical systems theory. Semistructured interviews were conducted with 6 logistics managers from large distribution centers who implemented mitigation strategies that demonstrably reduced technostress with their employees. Public documents and physical artifacts reviewed in this study included productivity assessment tools, information and communication technology system training materials, technostress mitigation instruments, and information from technological devices. Data were analyzed through a process of pattern matching, cross-case synthesis, and systematic text condensation. The findings included 6 themes: reliance on internal information technology experts; hiring temporary experts; maintaining communication and training; using time management skills and organizing priorities; identification and understanding of employee differences; and implementing well-being, fitness, and health programs. These findings could contribute to positive social change by providing logistics managers with strategies to reduce technostress, which could lead to improved employee well-being, better work conditions, and increased productivity for greater company profitability that could produce a more thriving and prosperous community.

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Dedication

I dedicate this doctoral study to global supply chain managers and logisticians in the Southern California area and the military members who provide seamless and integrated distribution worldwide.

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I would like to thank the faculty, special advisors, family members, friends, and fellow scholars, who helped to reach this point in my academic career. I appreciate COL. (Ret) Cornelius Easter, Dr. William O. Hedgepeth, Dr. Ify Diala, Dr. Carolyn Salerno, Dr. Freda Turner, Dr. Theresa Neal, Dr. Lisa Kangas, and Dr. Gene Fusch for their excellent mentoring.

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Section 1: Foundation of the Study

An ever-changing component of business organizations is the usage of information technology (IT). Between 2000 and 2010, firms achieved competitive advantages in advanced economies by implementing innovation in information and communication technology (ICT) to transform logistics and improve their market position (De Martino, Errichiello, Marasco, & Morvillo, 2013). The demand for logisticians to collaborate globally increases their requirement to use ICTs for knowledge sharing and decision making in support of supply chain management (SCM) operations (De Martino et al., 2013). The ability to conduct supply chain management hinges on corporate leaders implementing effective IT usage in strategic planning and system development to ensure collaboration for product innovation and to gain competitive advantages (Chen, Wang, Nevo, Benitez-Amado, & Kou, 2015). However, Jena (2015) reported that exposure to fast changing and new ICTs causes technostress for individual workers, which lowers productivity and job satisfaction. Moreover, Whelan and Teigland (2013) noted that the prolific ability of ICT to access and process information results in workers overwhelmed by information, which leads to underperformance, poor decision making, and declining morale. The increased usage of ICTs in the workplace raises technostress levels and negatively affects productivity (Salanova, Llorens, & Cifre, 2012). Logisticians' increased dependence on ICT, as noted by Prajogo and Olhager (2012), leads to adverse exposure of technostress creators, as reported by Jena (2015). Logistics managers should become more aware of how increased technostress exposure affects productivity and reduces competitive advantages.

Background of the Problem

Logistics managers seek ways to achieve competitive advantages over rival firms. The usage of ICTs in the workplace creates advantages in productivity and efficiencies (Jena, 2015; Tarutė & Gatautis, 2014). Key logistical technology components such as radio frequency identification (RFID), enterprise resource planning (ERP) systems, electronic data interchange (EDI) adaptation, and widespread Internet availability elevated logisticians' usage of ICT to conduct integration of information management, order processing, inventory tracking, warehousing activities, and transportation planning (Chuu, 2014). Moreover, Grant (2014) reported that there is an emergence of IT support in SCM activities. Additionally, Chen et al., (2015) noted the importance of IT system in shaping shape new product development. Thus, IT is an increasing and integral part of supply chain integration and new product development.

Logistics managers must understand stressors in the workplace that affect workers' well-being. Technostress is a form of stress connected with the usage of ICT, typically linked to rapid technological transformation causing psychological, physical, or behavioral strain (Brod, 1984; Sahin & Coklar, 2009; Weil & Rosen, 1997). Tarafdar, Bolman-Pullins, and Ragu-Nathan (2014) noted that technostress involves five subcomponents as follows: (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty. Jena (2015) noted that stressed individuals exhibit lower productivity levels and a have greater chance of quitting than workers with low stress levels. Workers who experience technostress have symptoms that manifest physiologically affecting the health and well-being of employees

by causing absenteeism or reduced productivity (Tarafdar et al., 2014). The research by Tarafdar et al. provides logistics managers a means to understand how technostress affects workers' well-being and the importance of developing an enduring workforce to remain competitive in a global economy.

Problem Statement

Technostress factors related to information overflow and interruptions from ICT usage overwhelmed 84% of surveyed employees and created workplace stress (Sellberg & Susi, 2013). U.S. industries reported that stress has a price tag of $300 billion annually linked to diminished productivity (Wood, 2014). The general business problem was that some logistics managers in distribution centers implemented ineffective practices to reduce technostress, which negatively affected employee productivity. The specific business problem was that some logistics managers in distribution centers lacked mitigation strategies to reduce technostress with their employees.

Purpose Statement

The purpose of this qualitative, exploratory, multiple case study was to explore the mitigation strategies that logistics managers used to reduce technostress with their employees. The population consisted of eight logistics managers from large distribution centers in the Los Angeles County, California area who implemented mitigation strategies that reduced technostress with their employees. This population represented logistics managers who succeeded in reducing the phenomenon of technostress in their distribution centers, which improved employee productivity. The results from this study contribute to logistics managers' ability to reduce the effects of technostress with their

employees and to provide new knowledge for improved business practices. The implications from this study could affect social change by contributing mitigation strategies for logistics managers to reduce technostress and improve employee productivity.

Nature of the Study

The three types of research methods mentioned by Allwood (2012) include qualitative, quantitative, and mixed method. The qualitative research method provided the best method to explore the phenomena because qualitative data offers a basis of information with a close-up view, and in a descriptive fashion to give a richer understanding of an identifiable local context (Petty, Thomson, & Stew, 2012). Other methods not used were the quantitative and mixed method because the circumstances of how technostress affects employee productivity has no associated variables or numerical data to examine, which made quantitative and mixed method research inappropriate for this research study. Thus, qualitative research was the chosen method for this research study to explore the mitigation strategies for logistics managers to reduce technostress with their employees.

Using an exploratory multiple case study design allows for an investigation of a phenomenon within its real-world context. Researchers use a case study design to facilitate the exploration of a phenomenon for an in-depth understanding of a case through multiple sources of evidence such as (a) direct observations, (b) interviews, (c) artifacts, (d) documents, (e) archival records, and (f) participant-observation (Verner & Abdullah, 2012; Yin, 2014). Additionally, applying a case study design provides rich

description and analysis of a phenomenon and to present the interconnectedness of individuals (Snyder, 2012; Yin, 2014). I selected a case study design over ethnography, phenomenological, and narrative research because (a) ethnographic design may produce researcher bias, (b) phenomenological design requires bracketing and prolonged interviews, and (c) narrative research design may fail to meet the necessary academic rigor and reliability. The focus of the ethnographic design is to develop complex descriptions of culture sharing groups or a subset of the group (Jarzabkowski, Bednarek, & Cabantous, 2015). The difficulty of applying phenomenological design relates to achieving bracketing and data saturation through prolonged interviews (Moustakas, 1994). Scholars who use a narrative research design may have problems with data collection validation and weak descriptive research, which fail to meet the necessary academic rigor for a reliable study (Erlingsson & Brysiewicz, 2013). Therefore, I selected the qualitative research method with a multiple case study design as the best approach for this research study, which ensured data saturation and provided an in-depth portrait of individual logistics managers in a real-world context.

Research Question

Case study researchers seek to understand how and why the phenomenon occurred and to draw conclusions from the participants (Yin, 2014). The research question for this study was the following: What mitigation strategies do logistics managers use in distribution centers to reduce technostress with their employees? Exploring the phenomenon of technostress provides logistics managers with information about how technostress creators such as (a) techno-overload, (b) techno-invasion, (c)

techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty affect employee productivity during daily operations.

Interview Questions

The following interview questions served as the basis for collecting data in exploring what mitigation strategies logistics managers used in distribution centers to reduce technostress with their employees.

1. What mitigation strategies did you use to reduce technostress on employees' productivity?
2. What strategies did you use to improve your employees' ability to perform strategic logistical planning and system development?
3. What were the most effective strategies you used in your center to handle information system interruptions and stoppages when employees conducted new product innovation?
4. What strategies did you use to help employees cope with techno-overload when required to work faster or longer while conducting buyer-supplier integration?
5. How did techno-uncertainty affect knowledge management between logistics managers and logistics workers due to information system changes and updates?
6. How did techno-insecurity affect employee job satisfaction and job performance?

7. How did techno-invasion affect employee absenteeism rate and employee health as it pertains to their ability to perform assigned workload?
8. How did employees cope with techno-complexity from new software or hardware upgrades related to ERP or EDI systems in the organization?
9. How did the senior leadership address technostress in the workplace?
10. What other information about mitigation strategies for technostress would you like to add that I have not asked?

Conceptual Framework

Trist and Bramforth's (1951) sociotechnical systems theory (STS) was the conceptual framework used as the foundation for this research study. The fundamental principles of the STS theory derive from the British coal mining methods by the Tavistock Institute, which revealed that employee behavior and work design interweave to the point that understanding technical processes requires understanding social processes (Emery, 1959). The STS theory focuses on increasing work productivity through work practices without large financial investments (Trist, 1981). Furthermore, STS theorists explore social and technical phenomena to understand relationships in an organization without prescribing design changes (Kull, Ellis, & Narasimhan, 2013). Vijayasarathy (2010) mentioned that the application of STS theory encompasses aspects of supply integration such as (a) information automation, (b) work practices, and (c) structural alignment. Thus, implementing STS theory as a conceptual framework for this study supported exploration of technostress' effect on employee productivity.

Researcher select the best theory to understand a phenomena in a research study. Kull et al. (2013) emphasized that observing supply chain management problems from the STS theory perspective provides a basis for exploring how people and processes interact to influence improved outcomes. The ability to use a theory, that incorporates both aspects, lends credence to the phenomenon under study. Implementing the STS theory brings forth the concept of how social, environmental, and technical elements sway employees' view of job satisfaction, and the optimization of these subsystems to enhance productivity (Pasmore, 1988). Hester (2013) noted that STS theory works well in qualitative studies to gain insight into interactions of STS components. Therefore, I used the STS theory in this study to understand the negative effects of technostress on employee productivity to gain a holistic view of the phenomenon and the mitigation strategies logistics managers used to address the challenges of technostress, technology overload, and job satisfaction.

Operational Definitions

Employee productivity: Employee productivity is the employed workers' ability to meet or exceed agreed upon job tasks with the provided set of tools, technologies, and procedures (Phipps, Prieto, & Ndinguri, 2013).

Information and computer technology (ICT): ICT is the technology related to information systems and communication networks (Salanova et al., 2012).

Technostress: Technostress is the psychological state induced by work overload from having multiple projects and work stoppage linked to outdated computers, software update issues, and network outages (Tarafdar et al., 2014).

Techno-complexity: Techno-complexity is the condition where ICT users experience stress related to learning a variety of applications, functions, and jargon associated with complex computer systems (Ahmad & Amin, 2012).

Techno-insecurity: Techno-insecurity is the condition where ICT users feel threatened about losing their job to other people who have a better understanding of computer work systems (Ahmad & Amin, 2012).

Techno-invasion: Techno-invasion is the condition where ICT users experience unclear boundaries between work-related and personal contexts based on having a continuous connection to work systems (Ahmad & Amin, 2012).

Techno-overload: Techno-overload is the phenomenon where demands on ICT users necessitate work at a fast pace and require long work hours (Ahmad & Amin, 2012).

Techno-uncertainty: Techno-uncertainty is the condition where ICT users experience continuous changes and upgrades due to rapid ICT migrations and require retraining (Ahmad & Amin, 2012).

Assumptions, Limitations, and Delimitations

Assumptions

Researchers begin doctoral studies with certain assumptions about their topic of study. Simon and Goes (2013) defined assumptions in research studies as relevant aspects of the study beyond a researchers' control. The first assumption in my research study was that logistics managers provided honest, accurate, and in-depth knowledge about mitigation strategies to reduce technostress. The second assumption was that the logistics

managers recruited for this study would willingly cooperate and share their personal experiences. Another assumption was that the pool of selected participants would serve as a fair and true representation of logistics managers. Finally, there was an assumption that the analysis of the interview responses would lead to common themes for mitigation strategies used by logistics managers in reducing technostress with their employees.

Limitations

Researchers must recognize what limitations they will encounter while conducting doctoral research. Simon and Goes (2013) defined limitations to doctoral research as potential weaknesses that span beyond the control of a researcher. In this study, the research data consisted of responses from semistructured interviews of logistics managers from large distribution centers, which served as a sample size limitation. Another limitation of the study involved recruiting logistics managers who succeeded in reducing technostress with their employees during new product development, knowledge management, and buyer-supplier integration. Finally, a third limitation of the study involved using logistics managers from large distribution centers, which served as a geographical limitation.

Delimitations

The scope and parameters of doctoral research provide researchers with left and right limits to guide their research. Simon and Goes (2013) emphasized that delimitations are factors that limit the scope and describe the boundaries of a research study, such as (a) the type of research questions asked during the study, (b) the objectives of the study, (c) and the theoretical perspectives used for the study. The scope of the study

delimitations entailed a purposive sample of logistics managers who succeeded in reducing the occurrence of technostress on employees' productivity in their distribution centers. The study did not include interviews with logistics managers who did not have knowledge or experience with business information systems, supply chain management ERPs, and EDI applications as part of their daily functions or the decision making process. Likewise, professionals in other industries may experience the circumstances associated with technostress, but the focus of this study was on the sample population of logistics managers from large distribution centers in the Los Angeles County, California area, who used mitigation strategies in reducing technostress with their employees.

Significance of the Study

This research study is of value to logistics managers because of its contribution to the body of existing literature on the negative effect of technostress on employees' productivity. The limited amounts of mitigation strategies connected to the negative effect of technostress and technology overload hampers logistics managers' ability to understand how technostress reduces employee productivity and increases inefficiency. Therefore, this study benefits logistics managers because of the link between technology usage and productivity in supply chain management. Furthermore, logistics managers conducting SCM linked to IT is an area where firms can achieve competitive advantages (Farahani, Rezapour, Drezner, & Fallah, 2014; Prajogo & Olhager, 2012). Logistics managers increase their firms' ability to remain competitive when they develop strategies to improve IT usage for greater productivity.

Contribution to Business Practice

This study contributes to the effective practices of business by reducing the gaps in understanding how technostress affects employees' productivity. Logistics managers count on the use of ICT to manage inventory controls; hence, disruptions from ICT system downtime negatively influences supply chain network production (Han & Shin, 2015). Increased technology downtime and disruptions lead employees to experience technostress (Sellberg & Susi, 2013). Consequently, businesses incur costs linked to technostress, which exceed $300 billion per year and led to decreased productivity from workplace stress, absenteeism, employee turnover, and medical issues (Wood, 2014). Therefore, the business benefits gained from findings in this research study are enhanced identification of mitigation strategies for reducing technostress of employees.

Implications for Social Change

The social implications of this research study include the potential for developing mitigation strategies to reduce technostress and to improve employee productivity. The intent of my research was to provide useful insights for logistics managers and to expand their knowledge of how technostress affects employee productivity. Organizations that show indications of technology overload will reduce technostress conditions by improving the workplace climate (Tarafdar et al., 2014). The application of the identified strategies gained from this research study may help logistics managers recognize and mitigate the following technostress subcomponents (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty to

create better work conditions for employees by reducing technostress exposure for stress reduction and greater employee well-being.

A Review of the Professional and Academic Literature

The phenomenon of technostress encompasses various components such as (a) techno-uncertainty, (b) techno-overload, (c) techno-complexity, (d) techno-insecurity, and (e) techno-invasion (Ahmad & Amin, 2012; Bucher, Fieseler, & Suphan, 2013), which negatively affect employee productivity. In this literature review, I identify strategies for my literature search and present the conceptual framework of STS theory as a lens for exploring the research study. Additionally, I provide a critical analysis and synthesis of literature themes related to technostress as follows: (a) logistics managers mitigation strategies, (b) strategic logistical planning, (c) new product innovation, (d) buyer-supplier integration, (e) knowledge management, (f) productivity, and (g) job satisfaction to understand how this phenomenon negatively impacts the lives and experiences of logistics managers and employees using ICTs. I review other emerging themes associated with employee productivity through the STS theory lens to explore technostress' effect on performance, absenteeism, physical effects, technology, ERP systems, and leadership.

Strategies for Literature Search

I used typical Boolean phrase search terms linked with the technostress phenomenon to find relevant sources to support my research. The databases that provided the most useful results were the comprehensive ProQuest, UMI ProQuest Digital Dissertation database, and EBSCOhost database, which included databases associated

with business studies and IT. The following search criteria provided insight on the technostress phenomenon: *technostress, technology overload, computer anxiety, information* and *communication technology (ICT), job satisfaction, job demands, workplace stress, techno-uncertainty,* and *techno-invasion*. After locating scholarly articles from the previously mentioned databases, I entered the articles in a literature matrix for logging information about the research topic. The matrix contained several sections: author/date, theoretical/conceptual framework, research question(s)/hypotheses, methodology, analysis and results, conclusions, implications for future research, and implications for practice. Additionally, I loaded the resources to the Zotero Standalone research tool to collect, organize, and cite the research reference list. The literature sources contain peer-reviewed journals and books. Table 1 is a depiction of the literature sources used and corresponding percentages.

Table 1

Literature Sources and Percentages

Resources	More than 5 years old	2012	2013	2014	2015	2016	Total
Books	8	0	2	2	0	1	13
Peer-reviewed Articles	8	29	46	40	19	0	142
Web Pages	0	0	1	1	1	0	3
Totals by Year	16	29	49	43	20	1	158
Percentage	10.1%	18.4%	31.0%	27.2%	12.7%	0.6%	100%

Sociotechnical System Theory and Technostress

The conceptual framework of STS theory focuses on increasing work productivity through performance as observed in social and technical phenomena (Kull et al., 2013; Trist, 1981; Trist & Bramforth, 1951). The ability to apply STS theory subsystems'

social, environmental, and technical factors provides logistics managers a holistic perspective to understand the phenomena of how technostress negatively affects productivity and yields insight for decision making during strategic logistical planning and system development to enhance efficiency. In addition, using STS theory subsystems allows logistics managers to explore technostress' effects internally and externally as they relate to supply chain work processes and human capital, which illuminate inhibitors of employee optimization such as job dissatisfaction, absenteeism due to stress and poor health, and technology overload from over exposure and disruptions from system downtime (Pasmore, 1988).

Logistics managers must determine what role sociotechnical components have in the productive usage of ERP systems. Grabot, Mayere, Lauroua, and Houe (2014) integrated the sociotechnical aspects of ERP usage between people to better support business processes and best practices such as teamwork, personal involvement, knowledge sharing, and distributed decision making. Moreover, implementing STS theory subsystems as a part of a framework to identify technostress, gives logistics managers opportunities to develop mitigation strategies to enhance productivity (Hester, 2013; Kull et al., 2013; Pasmore, 1988). The knowledge gained from using STS informs logistics managers in designing new technologies and technology-led change. Additionally, using STS as a predictive work tool to identify technostress problems and solutions in advance, leads to increased optimization and offers benefit for better decision making in SCM (Davis, Challenger, Jayewardene, & Clegg, 2013). Logistics managers

that apply STS as part of their firms' technical structure have a greater ability to improve business processes and best practices for better decision making in SCM.

Self-Efficacy Theory

An opposing theory to understand the phenomenon of technostress involves Bandura's (1995) self-efficacy premise linked to social cognitive theory (SCT). Bandura reported that the increase of technological growth in the workplace necessitate self-directed learning. According to the self-efficacy theory, professionals should be educated to aid in refining new skills for enhancement of their quality of life (Bandura, 1995). Bandura emphasized that people need to obtain certain cognitive abilities as well as maintain self-regulating behavior to appraise and release the desired strategies for handling dynamic conditions such as those involved with technological self-efficacy. According to Bandura's assertions, logistics managers conduct strategic logistical planning and system development efficiently when they lower the level of technostress and increase job satisfaction. However, in the self-efficacy theory, Bandura did not focus on the business aspects of the phenomenon of technostress. The self-efficacy theory captures concepts related to learning instead of business principles.

Cognitive Activation Theory of Stress

Another opposing theory focused on the learning and behavioral aspects of technostress, as mentioned in Ursin and Eriksen (2004), is the cognitive activation theory of stress (CATS). In CATS, Ursin and Eriksen addressed the stress responses associated with an increase in arousal, modifications of behavior, and changes with body parts. Ursin and Eriksen pointed out that CATS entails coping with positive outcome

expectancy, which enable predictions for relation to health and disease. The CATS is beneficial for exploring the impact of technostress on logisticians involved in strategic logistical planning and system development.

Furthermore, Meurs and Perrewé (2011) suggested using CATS as part of organizational stress research and future occupational research. Meurs and Perrewé provided an integrative theoretical approach to workplace stress using the CATS because stress remains a dominant issue in the field of workplace well-being. Finally, Oyeflaten, Midtgarden, Maeland, Eriksen, and Magnussen (2014) used CATS to determine the relationship between functional ability, coping, and health complaints to work and benefit status. Oyeflaten et al. argued that using CATS allows for considerations of learning and experience leading to positive outcome expectancies and success at work, despite having pain or other health complaints. Using the CATS provides an understanding of how technostress caused by technology overload and system interruptions accounts for the adaptive aspects and results of individuals in the workplace. However, the CATS does not include a focus on the business aspects of the phenomenon of technostress; instead, the focal point is on learning and behavior.

Neither Bandura's (1995) self-efficacy or Ursin and Eriksen's (2004) CATS provided the entire scope for evaluating technical systems like STS to ensure that the design and use of technology fit both human capital and the environment being affected (Ulhoi & Jorgensen, 2010). Applying STS allows for an in-depth exploration on how technology affects employee production and efficiency in a functioning supply chain environment based on the personal experiences of individuals conducting supply chain

management activities. The connectedness of STS subsystems allows for a more in-depth examination of technostress' negative effect on supply chain actions such as strategic logistical planning, new product innovation, buyer-supplier integration, knowledge management, productivity, and job satisfaction.

Mitigation Strategies of Technostress

Technostress affects the social, environmental, and technical aspects of logistics managers' daily lives and supply chain management activities. Logistics managers who recognize and reduce technostress creators develop mitigation strategies for greater productivity, effective business practices, and increased quality of life for employees. Ahmad and Amin (2012) mentioned five components of technostress: (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty, whereby effective logistics managers implement mitigation strategies to reduce technostress by facilitating workforce training, continuous learning, and technical support. Bucher et al. (2013) suggested the (a) adaptation of boundaries for home and work ICT usage to limit techno-invasion, (b) reduction of information to diminish techno-overload, and (c) conceptualizations of plans to analyze and understand new ICTs platforms for addressing issues with techno-uncertainty. Logistics managers who develop mitigation strategies for reducing technostress create opportunities for greater productivity and improved quality of life for employees by training their workforce, and using technical support to mitigate technostress components.

The high demand for instant responses to customer demands means workers use technology more to accomplish daily task. The increased access to technology away from

work to conduct daily functions could spill over into personal usage of IT and cause added stress to employees. In contrast to Bucher et al. (2013), Chesley (2014) reported that there is no connection to personal ICT usage and work ICT usage as it pertains to work strain, but found technological innovation as an important factor for employee distress. Moreover, Tarafdar et al. (2014) revealed that firms need to consider that technostress components and continual upgrades spawn dissatisfaction related to ICT benefits and hinder productivity. In a similar fashion, Muhammad, Quarat-ul-ain, and Nadeem (2013) found that role ambiguity like techno-insecurity and techno-uncertainty had a negative relationship with job satisfaction and job stress. An important mitigation strategy for controlling technostress involves efforts to increase job satisfaction and decrease job stress (Tarafdar et al., 2014). Establishing boundaries to reduce over exposure to technostress between work and home usage can also improve employee job satisfaction. Logistics managers must consider how outside factors may affect job satisfaction when conducting system upgrades.

Logistics managers must understand that workers view technology usage with various perspectives and comfort levels. Yan, Guo, Lee, and Vogel (2013) suggested that stress occurs from a misfit between people and the environment, which leads to negative attitudes and dysfunctional behavior. Hence, reducing the variables associated with technostress improves employee satisfactions by encouraging a supplementary fit between peoples' values and norms that match the organization (Yan et al., 2013). However, Kraan et al. (2014) identified technological pacing as a mitigation strategy to reduce ICT stress by conducting knowledge sharing and continuous learning. Cañibano

(2013) and Lee, Watson-Manheim, and Chudoba (2014) emphasized improved ICT communication and innovative practices such as telework, collaboration toolsets, and online internal platforms as mitigation strategies to change behaviors in the workplace and to improve workers social well-being. The identified mitigation strategies may help logistics managers to reduce technostress, which Tarafdar et al. (2014) noted may enhance employee productivity. The identified mitigation strategies provide measures for controlling technostress by increasing job satisfaction and decreasing job stress (Kraan et al., 2014; Lee et al., 2014; Zho et al., 2014). Logistics managers must implement mitigation strategies that balance between technology, people, and the work environment to facilitate knowledge sharing and communication that will reduce technostress and improve job satisfaction for greater employee productivity.

Strategic Logistical Planning and System Development

Logistics managers must meet the challenges of customers' demands in a rapid changing market. The quick pace of technological changes and the increased competitive demands for logistics services require industry providers to improve their innovation capabilities to develop and deliver services that meet customers' needs (De Martino et al., 2013). Colin, Galindo, and Hernández (2015) noted that ICT affects contemporary business. Thus, logistics managers depend on various IT systems to conduct SCM.

Logistics managers' usage of technology and logistical software improved distribution management and cargo tracking. De Martino, Errichiello, Marasco, and Morvillo (2013) conducted research related to innovation in seaports and reported that from 2003 to 2013, advances in ICT influenced logistics transformation, which required

industry operators to sustain growth of to maintain and improve their market positions. De Martino et al. (2013) noted that logisticians needed to place value on the strategic management of relationships and networking as a means for improving their logistical planning and system development at sea ports. As a result, increased ICT usage by logisticians such as multimodal transport operators, freight forwarders, and shippers to gain competitive advantages enhance their potential to experience technostress.

A central driving factor for improved SCM is usage of IT for competitive advantages. Zhou et al. (2014) identified the importance of logisticians conducting SCM linked to IT for firms to achieve competitive advantages. Farahani et al. (2014) emphasized IT and its use in organizations and across the supply chain as a determinant for logistical planning and system development, which yield competitive advantage for many corporations such as automotive, aerospace, and petrochemical industries. Farahani et al. also mentioned that successful supply chain management involves sophisticated software systems with Web interfaces, which compete against Web-based application service providers (ASP). Farahani et al. and Wu, Chuang, and Hsu (2014) noted that logisticians use ICTs to conduct e-commerce in the supply chain based on business-to-business (B2B) and business-to-employee (B2E) models, which allow oversight of materials, information, and finances as they move through a process between supplier, manufacturer, wholesaler, retailer, and the consumer. Thus, a firm's ability to collaborate by ICT usage enables new product innovation, buyer-supplier integration, and knowledge management for effective SCM. Logistics managers' reliance on ICTs to conduct

strategic logistical planning and system development creates increased opportunities for technology overload.

ICT usage from e-commerce and EDI systems provide information for production and provide competitive advantages for logistical planning and system development. Yeh, Lee, and Pai (2014) investigated the factors influencing e-businesses to develop IT capabilities from the perspectives of technology, organization, and the environment. Yeh et al. found that e-business IT capabilities have a positive influence on the implementation of IT strategies. Moreover, Yeh et al. found that technology factors such as IT maturity, IT infrastructure, IT human resources, and support from top management influence IT capability. Finally, Yeh et al. validated the correlation between IT capabilities and the effective implementation of IT strategies. Hence, ICT usage derived from strategic logistical planning and system development enables enterprises to use faster and more economical methods to provide diverse products and services, satisfying customer requirements and increasing enterprise value (Yeh et al., 2014). As a result, logistics managers must conduct strategic logistical planning to develop strategies that implement IT capabilities that produce competitive advantages.

The social interactions between logistics managers during SCM has an impact on technostress levels. Cepolina and Ghiara (2013) revealed that the overall competitiveness of the logistics chain depends on the coordination level and the synergy created between single participants. Cepolina and Ghiara further claimed that ICT systems, when integrated and interconnected, could provide real benefits to the intermodal transport chain in terms of (a) environmental and economic impact, (b) time savings, and (c)

reduction in road congestion. Moreover, Cepolina and Ghiara demonstrated the importance of ICT usage in port and logistics systems strategic planning and system development by port authorities. Consequently, IT integrated ports serve as new opportunities for competitive advantages as well as increased chances for technostress with logisticians.

IT processes used during seaport SCM affect competitive advantages for a firm. Sujetal and Navickas (2014) analyzed the impact of port logistics systems using IT to increase their competitiveness. Sujetal and Navickas found competitive forms of port-centric logistics systems between ports. The authors concluded that port logistics systems are factors in the interconnections and processes for determining competitive advantages, which increase the effectiveness of activities of port logistics, which aligns with findings by Cepolina and Ghiara (2013). Furthermore, Sujetal and Navickas mentioned that globalization processes establish the prerequisite to make certain and use effectively seaport logistics systems on national and international levels to ensure competitive advantages. Thus, based on increased consumption and demand for different products (Sujetal & Navickas, 2014), usage of ICTs for strategic logistical planning and system development at ports has worldwide implications on logisticians' opportunities for elevated exposure to technostress caused by technology overload.

Another aspect of ICT usage in strategic logistical planning and system development involves IT outsourcing by logistics service providers (LSP). Logistics service outsourcing differs relative to the extent of the outsourced services (Vieira, Coelho, & Luna, 2013). Vieira et al. (2013) identified a gap between ICT expectations

and satisfaction with LSP performance. Vieira et al. noted that ICT are essential for information management between supply chain partners, which facilitate integration, synchronization, visibility, and responsiveness between the contractor and the LSP. Gorla and Somers (2014) reported evidence of a strong relationship between the extent of outsourcing and the service quality. Gorla and Somers suggested firms achieve inter-organizational competitive advantages through inter-firm resources by retaining strategic planning and architecture design in-house. Therefore, logistics managers conducting strategic logistical planning and system development with ICT for IT outsourcing must consider process steps identified by Vieira et al. such as (a) implementation organization, (b) process setup, (c) technology setup and training, and (d) external integration and finalization to achieve competitive advantages. Consequently, the gap between ICT expectations and satisfaction with LSP performance could expose logisticians to additional stressors when conducting strategic logistical planning and system development linked to IT outsourcing.

Lastly, role stressors based on leadership practices influences effective strategic logistical planning and system development. Ebrahimi, Wei, and Rad (2014) examined the multidimensionality of total quality management (TQM) practices and their impact on role stressors. Ebrahimi et al. (2014) investigated the relationship between the three criteria of role stressors (a) role conflict, (b) role ambiguity and (c) role overload, and the eight criteria of TQM practices (a) leadership, (b) customer focus, (c) process management, (d) employee management and involvement, (e) supplier management, (f) strategic planning, (g) human resource focus, and (h) information analysis. Ebrahimi et

al. conceptual model found increased involvement related to leadership, customer focus, strategic planning, process management, information analysis, employee management, and supplier management during strategic logistical planning and system development, which reduces the role stressors.

Strategic alignment of IT by corporate leadership has a significant impact on (a) structure and process, (b) service quality, and (c) organizational performance linked to sustainable competitive advantage (Albaloula Ali, 2014; Garg, 2015). The antecedents of strategic alignment identified by Albaloula Ali (2014) and Garg (2015) support elements of Ebrahimi et al. (2014) TQM practices, which influence role stressors needed for sustainable competitive advantage. Thus, logistics managers should consider role stressors' effect on strategic planning and role overload when using ICTs.

ICT usage in strategic logistical planning and system development encompass various aspects of supply chain management such as e-commerce processes, EDI system applications, IT outsourcing, port logistics, and strategic alignment of process and structure, which logistic leaders must consider and face as possible role stressors. Managers depend on various IT systems to conduct strategic logistical planning and system development for decision making to achieve competitive advantages (Perez-Arostegui, Benitez-Amado, & Tamayo-Torres, 2012). Increased ICT usage enhances the potential to experience technostress from technology overload and role stressors (Tarafdar et al., 2014); logistics managers attempting to gain competitive advantages need to understand how technostress affect productivity.

New Product Innovation in Supply Chain Management

Themes in IT innovations for competitive advantage related to SCM involve trends in new product innovation, knowledge sharing for buyer-supplier integration, and utilization of an IT outsourcing strategy. Innovation helps businesses explore new trends within an industry to determine the development of new product and maturation of a product within an industry for competitive advantages. Therefore, innovation is an important component for a firm's profitability and competitiveness (Thomas, 2013). Thomas (2013) investigated the effectiveness of computer-mediated and face-to-face communication channels on knowledge exchange between buyer and supplier firms, and ultimately buyer new product development (NPD) and market performance. Logistics managers that garner the importance of the relationship between IT infrastructure, strategic resourcing, and external forces create a robust environment for new product development processes for competitive advantages by considering geographical, cultural, and political factors. Logistics managers' dependence on ICT usage for SCM effects production and provide competitive advantages for new product innovation in supply chain management. The ability to communicate and exchange knowledge for new product development is essential for SCM.

Furthermore, the incorporation of Internet business, EDI usage, and ERP systems has a significant impact on SCM to create efficiency. Farahani et al. (2014) and Wu et al. (2014) mentioned that information management and technology related to e-commerce intensified due to development of information and communication technologies (ICT), which include electronic data interchange (EDI) to overcome the ever-increasing

complexity of the systems driving buyer-supplier relationships in SCM. The growth in IT and EDI increased logisticians' interactions with ICTs. Thus, increased ICT usage by logisticians for new product innovation in SCM boosts their possible exposure to the negative effects of technostress from technology overload and role stressors (Salanova et al., 2012).

The current drivers of IT for competitive advantage in SCM involve firm's implementing the most up-to-date developments, which require logisticians to change resource-planning tools to accommodate new product innovation and customer demands. Feng and Wang (2013) investigated the impacts of supply chain involvement (SCI) on new product development (NPD) performance. Feng and Wang reported that by developing new products speedily, firms achieve; (a) greater customer demand, (b) higher returns, (c) timeliness of product entry, (d) technological edge, and (e) customer satisfaction and loyalty. Therefore, industry demands in SCM necessitate ICT usage in various work functions performed by logisticians, which makes them susceptible to the negative effects of technostress.

In addition, logistics managers require enterprise IT systems for management of supply chain operations and product tracking. Li (2012) reported that enterprise IT implementation enhances collaborative planning, forecasting, and inventory replenishment in the supply chain. Supply chain in-transit visibility utilizes innovate technology such as (a) radio frequency identification (RFID), (b) near field communications (NFC), and (c) electronic product code global (EPCglobal) standard. Yazici (2014) mentioned that RFID technology has the potential to enable better service,

lower costs, and provide a tool for managing and tracking materials and information flow. Applying real-time location devices with RFID provides knowledge sharing for increased buyer-supplier integration. The various forms of electronic devices and interface systems linked to enterprise resource planning tools inundate logistics managers and employees to maintain knowledge and expertise with supply chain internal traceability systems for knowledge sharing in a coherent manner.

Collaboration for Buyer-Supplier Integration

Supply chain collaboration is essential for organizational performance (Li, 2012; Qrunfleh & Tarafdar, 2014). Increased demand for product development and manufacturing through globalization pressures logisticians to collaborate in multiple markets throughout the world, which requires ICTs for knowledge sharing and decision making in support of SCM operations (De Martino et al., 2013). The usage of ICTs shortens the geographical distances between firms by using virtual teams to conduct organizational collaboration.

Chuu (2014) noted that SCM software such as EDI, ERP, and RFID comprises various software formats and uses unique mathematical algorithms to advance business processes. Consequently, using enterprise technology within an organization between supply chain partners saves time, reduces data entry errors, and contributes to reduced production costs, which result in better operational performance (Li, 2012). Additionally, Farahani et al. (2014); Prajogo and Olhager (2012) and Wu et al. (2014) recommended for logisticians to accomplish the objectives of IT development and E-commerce, the implementation of supply chain management in organizations is a fundamental necessity

for collaborative integration. Moreover, Li (2012) noted that supply chain collaboration is essential for organizational performance.

Equally important, Kim, Cavusgil, and Cavusgil (2013) mentioned that IT alignment and strategic collaboration with a major supply chain partner are crucial antecedents of relationship-enhanced responsiveness; neither of them may occur if the firm does not recognize the strategic importance of its supply chain partner. Nonetheless, Ramanathan (2014) acknowledged identifying the benefits of collaboration is still a big challenge for many supply chains. However, Ramanathan does recognize human interactions in supply chains (SCs) can assist appropriate investment decisions in IT and collaborations to improve SC processes, depending on the level of flexibility in collaboration between partners to achieve the business objectives.

For this reason, logistics managers using ICTs facilitate information exchange, which helps organizations and suppliers reduce costs, improve efficiency, and creates competitive advantages. Hence, the demand for collaborative integration between buyers and suppliers necessitate usage of IT to conduct virtual SCM management and coordination. Therefore, the complexity and variations of EDI systems and ERP tools utilized for competitive advantages exposes logistics managers and employees to the negative effects of technostress and technology overload as they conduct collaboration for buyer-supplier integration and knowledge sharing (Prajogo & Olhager, 2012; Qrunfleh & Tarafdar, 2014).

ICT for Knowledge Management Sharing

Businesses must encourage the use of IT for knowledge management and competitive advantages to promote rapid business growth and hypermarkets to enforce barriers to entry for improved buyer-supplier integration. With this objective in mind, logistics managers use IT for information sharing and knowledge management (KM) strategies, which influence innovation and organizational performance (Colin et al., 2015). Knowledge management systems (KMS) exercise IT platforms, which amalgamate technical and organizational aspects for information storage and exchange. Additionally, Canzano and Grimaldi (2012) and Davison, Ou, and Martinsons (2013) mentioned that technological applications influence the processes of knowledge generation, storage, sharing, and application, which are useful in sustaining a knowledge management program.

Incidentally, the utilization of IT for competitive advantages helps managers achieve lower costs and better quality through collaboration and knowledge sharing (Liu, Leat, Moizer, Megicks, & Kasturiratne, 2013). Logistics managers that use KMS technologies see potential growth and changes linked to Web 2.0, social networking, mobile phones, and other forms of e-commerce (Chen, Chiang, & Storey, 2012). As a result, logistics managers implementing KMS require adoption of new skills for improved knowledge sharing and productivity when using information sciences (IS) technology (Chen et al., 2012).

The main goal of ICT in the SCM is to strengthen existent trade agreements with suppliers and customers, which serve as an important mechanism for firms to innovate

and be effective and efficient (Colin et al., 2015). Logistics managers use ICTs for knowledge management and sharing to gain competitive advantages for buyer-supplier integration. Colin et al. (2015) noted that implementation of ICT in SCM provides a positive impact in firms as it relates to procurement, which enhances collaboration and improves the quality of information shared between suppliers and buyers. The requirement for internal technical proficiency to maintain a successful knowledge management program mandates logisticians adopt new skills related to ICT utilization, which helps SC managers achieve lower costs and better quality. Thus, logistics managers may experience opportunities for increased contact with the negative effects of technostress and technology overload when using IT for knowledge management and sharing as part of strategic logistical planning and system development (Chen et al., 2012). Moreover, in an effort to achieve increased productivity from ICTs, employees may experience stressors related to technostress (Colin et al., 2015; Qrunfleh & Tarafdar, 2014).

Technology Usage and Productivity in Supply Chain Management

An essential component of supply chain management involves using IT and ERP systems, which provides increased productivity and efficiency for competitive advantages (Madapusi & D'Souza, 2012; Mishra, Modi, & Animesh, 2013; Seethamraju & Krishna Sundar, 2013). Therefore, Colin et al. (2015) noted that ICT have a massive consequence on contemporary business. The main purpose of investments in ERP systems is to enhance the organizational efficiency and effectiveness, and the benefits of IT investments provide productivity gains (Salarzadeh et al., 2013). Perez-Arostegui et al.

(2012) determined firms that align their ICT adaptation with strategic business objectives achieve improved performance of internal processes, customer satisfaction, and finances. Likewise, Cardona, Kretschmer, and Strobel (2013) noted that ICT usage required embedding ICTs with complementary organizational investments, skills, and industry structures. Furthermore, Colin et al. mentioned that the competitive global environment is forcing organizations to become lean and effective by using technology-based innovation focused on improving the delivery system, which increases productivity. In addition, Agus and Hajinoor (2012) found there was a statistically significant connection between lean production and business performance. For this reason, Colin et al. noted that contextual factors and different stages of ICT employment influence performance and SCM productivity.

Along with this line of logic, Ralston, Grawe, and Daugherty (2013) identified contextual factors for logistics salience on logistics capabilities and performance, which included differentiated services and innovative logistics operations to their customers that creates corporate and customer value. Other areas where ICT improved productivity link to foresight processes as outlined by Keller and vonder Gracht (2014). Additionally, DeGroote and Marx (2013) found IT amplifies the supply chain's ability to react to market changes by reducing costs, improving quality and executing strategic plans. Lastly, Mishra, Modi, and Animesh (2013) reported that IT has a positive influence on inventory efficiency, which increases market returns and reduces risk.

Logistics managers' usage of IT instigated positive effects related to productivity and profitability while providing competitive advantages for strategic logistical planning

and system development. Logistics managers' continuous work with improving supply chain efficiency and productivity magnifies the likelihood to encounter the negative effects of technostress and technology overload. However, Salanova et al. (2012) found technostress negatively effects productivity when interacting with IT innovations. Conversely, Ahmad, Amin, and Ismail (2012) reported that certain amount of stress is necessary for the well-being of the employees and the success of an organization. Also, Kim, Lee, Yun, and Im, (2015) reported that mobile enterprise via smart phone usage may be vulnerable to various types of stress including work exhaustion linked to technology overload. Moreover, Han and Shin (2015) noted that disruptions from network downtime affected nodes in supply chain production. Consequently, logistics managers' dependence on ICTs for efficiency and productivity to gain competitive advantages for strategic logistical planning and system development potentially leads to instances of technology overload from disruptions and reduced productivity.

Technostress and Job Satisfaction

Over exposure to ICTs may cause technostress and effect job satisfaction (Limbu, Jayachandran, & Babin, 2014; Rai & Hornyak, 2013), for logistics managers. Additionally, Bala (2013) used STS theoretical framework to validate SCM employees' perceptions of changes in work process characteristics influence (a) job performance, (b) job satisfaction, (c) job anxiety, (d) and job security based on implementation of IT-enabled systems. Previous studies by Tarafdar et al. (2014) found technostress creators set the condition for strains, which reduces user satisfaction with ICTs. Conversely, Diaz, Chiaburu, Zimmerman, and Boswell (2012) reported that positive attitudes toward

communication technology (CT) and actual CT use have implications for understanding work-to-life conflict and found that higher levels of CT flexibility did indeed relate to more CT use by employees. With Bala (2013) and Diaz et al. (2012) comments in mind, I endorse the premise that job satisfaction links to workers' perception, experience, motivation, and attitudes.

Further literature by Tarafdar et al. (2014) revealed technostress' connection with job dissatisfaction and reduced productivity for users links to individual experiences and demographics. In addition, Parayitam, Desai, Desai, and Eason (2009) revealed a negative correlation between computer anxiety and attitude towards computer, which influence job satisfaction, career satisfaction, and identified stressors related to technostress. Paradoxically, Pai, Yeh, and Huang (2012) identified professional commitment and motivation as the key elements in job satisfaction and workplace stress linked to IT usage. Pai et al. reported that job satisfaction influences professional commitment, while general satisfaction toward work achievement has the highest impact on professional commitment. Additionally, Newton and Teo (2014) identified that work stressors such as role-conflict, role-ambiguity, and role-overload effect job satisfaction and organizational commitment. It appears that job satisfaction and job stress interrelate with ICT usage and influence employees' perception, experience, motivation, and attitudes toward work commitment (Bala, 2013; Limbu et al., 2014; Newton & Teo, 2014; Pai et al., 2012).

The dimensions of technostress are factors for techno-exhaustion along with normal work-stressors, which both induce work-exhaustion (Maier, Laumer, & Eckhardt,

2015). Maier et al. (2015) mentioned that work-exhaustion was a key factor for decreasing job satisfaction and employee turnover. Furthermore, employees who have an increased techno-induced workload have a hard time relaxing at home (Maier et al., 2015). The research by Maier et al. (2015) whereby techno-exhaustion indirectly effects work outcomes supports findings by Bala (2013) and Pai et al. (2012) that job satisfaction and job stress interrelate with ICT usage, and persuade employees' views, organizational commitment, and turnover intention.

Technostress: performance and productivity. Equally, important, Khan, Rehman, and ur-Rehman (2013) explored an association between technostress and job satisfaction, and found job satisfaction plays a pivotal role in enhancing workforce productivity. While the length of time for the study served as a limitation, Knani (2013) reported that implementation of new technology has a negative effect on employees' physical and mental health, job satisfaction, and productivity. Consequently, Chesley's (2014) assessment of both work and personal ICT usage pointed to technological innovation as an important factor influencing work intensification processes and linkage to employees' levels of work strain and distress. However, Chelsey found personal usage of ICT and forms of work-related ICT usage not connected to work intensification processes provided possible mitigation to reduce the negative effects of work use and improve productivity. In contrast, to reporting by both Knani and Chelsey, other researchers linked excessive workplace stress with evidence of past or continuing re-organization and re-structuring (Connell, Gough, McDonnell, & Burgess; 2014; McVicar, Munn-Giddings, & Seebohm, 2013). The instability of the work environment

leads to stress problems associated with job performance, productivity, absenteeism, turnover, and mental health (Bala, 2013; Connell et al., 2014; McVicar et al., 2013).

Other factors that lead to technostress and effect productivity based on social, technical, and environment aspects, are organization transformation and information overload (Connell et al., 2014; van Deursen & van Dijk, 2014). The main driver of workplace stress is the increased demand for services and product innovation from ICT usage, which influence strategic and financial dimensions of performance (Connell et al., 2014; Tarutė & Gatautis, 2014). Connell et al. (2014) reported that increased volume of ICTs transformed work and work organization, which enhanced product innovation and services lead to issues of employee turnover, job satisfaction, and increased stress. However, Whelan and Teigland (2013) noted that the prolific ability of ICTs to access and process information results in workers overwhelmed with information, which leads to under-performance, poor decision making, and declining morale. While that is the case, van Deursen & van Dijk (2014) held that system malfunctions and insufficient user ICT skills lead to increased loss labor time, which decreases productivity.

Furthermore, Nadinloyi, Sadeghi, and Hajloo (2013) mentioned that job satisfaction has a major influence on job-related behaviors such as intentions to turnover, absenteeism, and job performance, which have an economic effect on firms. In addition, Nadinloyi et al. (2013) reported that there was a positive relationship between job dissatisfaction of employees and the global index of mental health, social action, and depression. As a result, technostress influence on workers' perception, experience, motivation, and attitudes affects productivity and workers' performance (Khan et al.,

2013; Nadinloyi et al., 2013; Tarafdar et al., 2014). Additionally, organization transformation, information overload, user training, and malfunctioning ICTs degrade performance and productivity (Connell et al., 2014; Tarutė & Gatautis, 2014; van Deursen & van Dijk, 2014; Whelan & Teigland, 2013).

Previous studies on technostress by researchers demonstrated that stress derived from computing devices was due to unfamiliarity, uncertainty, and insecurity with technology (Hung, Chen, & Lin, 2015). Once users gain increased familiarity, technological competence rises in the workplace, but extended exposure to technology may elevate technostress levels (Hung et al., 2015). However, Hung et al. (2015) noted that an opposing view that techno-overload leads to improved work performance and enhances productivity, while communication overload tends to lower productivity when using mobile devices. Mangers that use proactive personality traits to reduce technostress impact communication overload and affect workers' productivity (Hung et al., 2015). Finally, viewing performance and productivity through the lens of STS theory provided insight on how logistics managers interact with the social, technical, and environmental conflicts linked to the negative effects of technostress and job satisfaction based on increased demands for ICTs usage or mobile devices impact communication overload, which effects workers' productivity.

Job satisfaction: absenteeism and burnout. In support of STS social and environment components, Khalatbari, Ghorbanshiroudi, and Firouzbakhsh (2013) determined there is a correlation between job stress, job satisfaction, job motivation, burnout, and feelings of stress. Technostress from increased IT usage reduces

productivity based on various scales used to measure and examine the relationship among ICT demands, supports, employee outcomes, mental health, and technology implementation (Day, Paquet, Scott, & Hambley, 2012; Knai, 2013; McVicar et al., 2013; Nadinloyi et al., 2013; Shih, Jiang, Klein, & Wang, 2013). The connectedness of job stress to job dissatisfaction, turnover, mental health issues, and decreased productivity should cause managers to take note how burnout influences poor performance and reduced profitability (Khalatbari et al., 2013; Shih et al., 2013). Thus, logistics managers' exposure to the negative effects of technostress and technology overload has significant impact on their social capacity to conduct strategic logistical planning and system development. Managers could improve the social and environmental conditions in the workplace by understanding the experiences of employees and reduce technostress exposure to decrease absenteeism, and enhance job satisfaction for greater productivity and company profitability (Khalatbari et al., 2013; Shih et al., 2013).

Technostress: physical effects. ICT is a pivotal component of today's competitive workplace, which permeates the planning, organizing, staffing, leading, and controlling functions of an organization (Soylu & Campbell, 2012). Thus, viewing the negative effects of technostress through the lens of STS reveals the social well-being and quality of life logisticians' experience during utilization of ICTs for logistical planning and system development. Soylu and Campbell (2012) noted that increased emotional and physical stressors expose employers to additional workers' compensation liability. Additionally, Knani (2013) reported that implementation of new technology has a negative effect on employees' physical and mental health, job satisfaction, and

productivity. Equally important, Nadinloyi et al. (2013) mentioned that there is a positive relationship between job dissatisfaction of employees and the global index of mental health, social action, and depression.

Equally important, Honda, Date, Abe, Aoyagi, and Honda (2014) found that workers with a high risk of depression experienced job-related stress and low job satisfaction. Furthermore, Saganuwan, Ismail, and Ahmad (2015) noted that technostress causes health ailments and increased health care costs. For this reason, the negative influence of technostress dampens the positive effects of technology-enabled innovation (Tarafdar et al., 2014).

As an illustration of how technostress produces negative health effects, Riedl, Kindermann, Auinger, and Javor (2012) provided insight on the neurobiology element associated with human computer interaction (HCI) and technostress by measures acute stressors linked to computer system malfunctions. Riedl et al. (2012) reported that technostress from system malfunctions increases stress hormone levels in user, which entice negative physiological and behavioral responses. In another case, Mano (2013) reported that physiological responses such as pain and stress linked to ICT workload usage from email overflow have a negative influence on workers quality of life. As a result, Fuglseth and Sørebø (2014) reported that stressed individuals have lower productivity and are likely to quit. Therefore, the negative influence of technostress leads to increased health and mental problems, which affect logisticians' social well-being, quality of life, and job satisfaction. Moreover, increased health issues and absenteeism

linked to technostress elevates employer costs associated with workers' compensation and reduces worker productivity.

Technostress: technology, ERP systems, and leadership. Logistics managers face daily technostress associated with the dynamics involved in strategic planning and new product development. Most of their daily job strain and employee dissatisfaction arises from integrating new technology and techno-overload linked with ERP systems demands. Barnard, Bradley, Hodgson, and Lloyd (2013) found the difficulties to learn a new technology is dependent on the perceptions and experiences of the users; and the characteristics of the technology determine how difficult it is to learn new systems. Furthermore, Garaca (2011) revealed both perceived ease of use and usefulness of the ERP system significantly contribute to the satisfaction with ERP usage. Madapusi and D'Souza (2012) confirmed that ERP system implementations influence operational performance, at both, the modular and the systemic levels. Tams, Thatcher, Grover, and Pak (2015) noted that self-efficacy and interruptions from the contemporary work environments associated with new technology contributed to technostress among employees. In addition, Garaca (2011) mentioned that internal factors such as computer anxiety correlates to job satisfaction. Thus, transitioning to ERP systems requires organizations to make adaptive changes and commitment to new technology to ensure user satisfaction.

Hwang and Min (2013) identified drivers that facilitate or hinder the implementation of enterprise resource planning (ERP) in business environments. Drivers such as internal environment and supplier capabilities influence successful adaptation of

ERP systems through enhancement of information accessibility, process improvement, and product innovation (Hwang & Min, 2013). Incidentally, the aforementioned drivers align with using STS theory as a lens for understanding how environmental and technical elements of ERP systems adaptation affect logisticians' ability to conduct strategic planning and system development. Grabot et al. (2014) emphasized the social element of ERP systems by restructuring business processes around concepts like team working, personal involvement, knowledge sharing, and distributed decision making.

In many cases, senior logistics managers commitment to implementing ERP systems and ICTs in organizations influence workers' acceptance, and determines the level of technostress workers experience based on policies, integrated product development, and exposure to technology overload (Sommer, Dukovska-Popovska, & Steger-Jensen, 2014; Teasley, Jordan, & Sangtani, 2012). Using STS theory to provide a conceptual framework, Teasley, Jordan, and Sangtani (2012) reported that the task satisfaction of individuals mitigates potential counter-productive outcomes based on environmental influences. Paradoxically, Harris, Marett, and Harris (2013) mentioned that abusive supervision leads to feelings of pressure to produce, which leads to higher job frustration and to lower job performance and further abuse by supervisors. Equally important, Mihalcea (2013) identified leaders' personality profile traits such as tolerance, flexibility, creativity, and achievement via independence lead to job satisfaction. Thus, logisticians encounter job satisfaction issues stemming from logistics managers' leadership ability to articulate technology policies, and provide visibility and support throughout the organization. Syrek, Apostel, and Antoni (2013) found to overcome job

demand stressors; it is important that employees receive support from transformational leaders, who instill confidence in their employees. One may infer from evidence by both Mihalcea and Syrek et al. that leadership traits and factors associated with ERP systems contribute to job satisfaction and levels of technostress that employees' experience, which may diminish productivity.

Transition

In Section 1, I discussed the negative effects technostress has on logisticians' productivity in the background and problem statement sub-sections. In addition, I discussed the purpose and nature of the study viewed through the lens of STS theory. Furthermore, the section included an analysis of the professional literature, which revealed the phenomenon of technostress' effect on elements of STSs related to (a) logistics managers mitigation strategies, (b) strategic logistical planning, (c) new product innovation, (d) buyer-supplier integration, (e) knowledge management, (f) productivity, and (g) job satisfaction. The foundational aspect in the literature revealed mitigation strategies that logistics managers could implement for increased productivity, and improve work conditions for technostress reduction.

In Section 2, I described the research method, research design, data collection, and data analysis, which ensured data saturation, reliability, and validity during this study. I also addressed member checking, and triangulation for dependability, credibility, confirmability, and transferability. Finally, in Section 3, I discussed the presentation of the findings, the implication for social change, recommendations for action, application

of the study to professional practices, and recommendations for future research based on limitations.

Section 2: The Project

The rapid growth of the logistics industry in the next five years means firms need to seek better strategies to manage the workforce. Personnel from the U.S. Bureau of Labor Statistics (2014) reported that employment of logisticians' growth rate would expand 22% from 2012 to 2022, which is faster than the average for all occupations. The Los Angeles metropolitan areas have an estimated 4,280 distribution managers, which is the highest employment level in this occupation across the United States (U.S. Bureau of Labor Statistics, 2015). Corporate leaders determine the effectiveness of IT usage to ensure collaboration for product innovation and to gain competitive advantages (Chen et al., 2015). Logisticians' increased dependence on ICT as noted by Prajogo and Olhager (2012) leads to increased exposure of technostress as reported by Jena (2015). Technostress factors related to information overflow and interruptions from ICT usage overwhelmed 84% of surveyed employees and created workplace stress (Sellberg & Susi, 2013). U.S. industries reported that stress has a price tag of $300 billion annually linked to diminished productivity (Wood, 2014). Logisticians who find ways reduce technostress can improve productivity and diminish the costs associated with stress in the supply chain industry.

Section 2 includes reassertion of the purpose statement, the role of researcher, description of the participants, and the selected research method and design. Section 2 also contains discussions about population and sampling, ethical research, data collection, data collection technique, data organization technique, and the chosen data analysis. I

also address research reliability and validity in this section. Finally, this section contains a summary of Section 2 and an overview of Section 3.

Purpose Statement

The purpose of this qualitative, exploratory, multiple case study was to explore the mitigation strategies that logistics managers used to reduce technostress with their employees. The population consisted of eight logistics managers from large distribution centers in the Los Angeles County, California area who implemented mitigation strategies that reduced technostress with their employees. This population represented logistics managers who succeeded in reducing the phenomenon of technostress in their distribution centers, which improved employee productivity. The results from this study contribute to logistics managers' ability to reduce the effects of technostress with their employees and to provide new knowledge for improved business practices. The implications from this study could affect social change by contributing mitigation strategies for logistics managers to reduce technostress and improve employee productivity.

Role of the Researcher

The researcher serves as the research instrument for interviewing participants and providing qualitative rigor by using semistructured interviews with open-ended questions and analyzing the responses in an unbiased manner (Erlingsson & Brysiewicz, 2013; Peredaryenko & Krauss, 2013). My role during the data collection process was to serve as the research instrument for interviewing participants and providing qualitative rigor. Conducting data transcription, affirming participants' responses, and clarifying

participants' answers with follow-up questions as a part of member checking ensures validity and reliability (Harper & Cole, 2012; Marshall & Rossman, 2016). In my research study, I ensured reliability and validity through the combination of conducting data transcription, affirming participants' responses, and performing member checking with participants.

Incidentally, I had direct experience with participants and knowledge of how implementations of ICTs affect technostress among logisticians. During my 20-year tenure as a logistics manager, I witnessed numerous professionals who exhibited episodes of technostress. In addition, working in the field of transportation and logistics exposed me to the effects of IT overload while conducting strategic logistical planning, which hindered my employees' productivity during system outages.

I followed a protocol for the protection of human subjects and promoted the ethical treatment of participants. The 1979 Belmont Report outlines protection of human subjects and ethical treatment of participants (National Institute of Health, 2013). Monitoring behavior and assessing ethical conduct allowed me to interpret data from the participants' actions. Additional ethical standards applied in the research approach included (a) gaining informed consent, (b) maintaining confidentiality, (c) respecting the autonomy of persons, (d) ensuring the principles of beneficence, and (e) guaranteeing justice as noted by the National Institute of Health (2013).

Researchers seek ways to reduce bias when conducting research studies. Yin (2014) noted that conducting bias management and maintaining self-awareness helps to prevent plagiarism, deception, and falsification of information. Using Roulston and

Shelton's (2015) suggested techniques such as (a) interrogation of the relationship between theory and method, (b) examinations of researcher roles, and (c) analyses of the researchers' work helped me to limit bias. I employed bias management techniques during my research and maintained self-awareness to limit bias. Finally, I avoided researcher biases by (a) comparing participants' interviews, and (b) debriefing peers to clarify theories associated with the effects of technostress on employees' productivity.

I maintained proper qualitative interview protocol by developing seven -10 open-ended questions (Appendix A) to provide insight into the negative effect of technostress on employees' productivity for rich qualitative data analysis. Qualitative interview questions serve as a procedural guide to direct the interview process (Jacob & Furgerson, 2012). The questions (Appendix A) I used during my research study guided the interview process. Jacob and Furgerson (2012) recommended using a script to ensure that the interviews proceed in an ethical manner and that the consent of the interviewees happens in a consistent manner. I devised interview protocols (Appendix B) and used a script to ensure ethical interviews occurred and gained consent before conducting interviews. Jacob and Furgerson mentioned that effective interviews include measures such as (a) eye contact with interviewees; (b) quiet locales for interviews; and (c) ensuring interviewees receive genuine care, good listening, and focused questions to keep the interview on track. As part of my semistructured interviews, I implemented measures outlined by Jacob and Furgerson to keep interviews on track.

Participants

Recruiting participants capable of answering the overall research question is an essential element for establishing eligibility criteria for study participants (Erlingsson & Brysiewicz, 2013). Using a criterion-based and purposive sampling method to solicit participants ensures research credibility and trust (Bernard, 2013; DeGrezia & Scrandis, 2015; Petty et al., 2012). With this in mind, I applied a criterion-based and purposive sampling as the primary method to recruit logistics managers with successful mitigation strategies for reducing technostress and improving employee productivity during my research study. In addition, I recruited all participants based on established parameters set by the Belmont Report guidelines and Walden's institutional review board (IRB) requirements to ensure ethical compliance.

The eligibility criteria for study participants included logistics managers from large distribution centers in the Los Angeles County, California area, who successfully used mitigation strategies to reduce technostress with their employees. Goldman and Swayze (2012) noted that recruited participants endow the experience and knowledge of the phenomenon. I used logistics managers who met the listed criteria to ensure that the recruited population had the experience and knowledge of the technostress phenomenon. Thus, the participants in my research conformed to requirements needed to maintain qualitative rigor; and they provided the breadth and depth of life experience to answer the overarching research question.

Strategies for Access to Participants

Researchers improve the quality of a study by using qualified participants that have the best insight about the phenomenon. Ensuring qualitative rigor and a degree of randomization to the participant selection process requires using various strategies for gaining access to participants (Bernard, 2013; Nudzor, 2013). I implemented three strategies to recruit participants. The first strategy included accessing logistics manager from two local publically available business directories from the Los Angeles Customs Brokers and Freight Forwarders Association and Valley Industry & Commerce Association. Goldman and Swayze (2012) reported that managers hold information significant to the case under study. The two commerce association databases list publically available items such as address, e-mail information, and phone number. The second strategy I used to recruit participants involved accessing local logistics manager from the publically available Trustoria National Professional Directory database found online at http://trustoria.com. The Trustoria National Professional Directory database lists managers' professional profile data such as employment history, education, resumes, e-mail addresses, and phone number. The third strategy to recruit participants involved using snowball sampling to recruit participants from a referral process. Using snowball sampling allows researchers to ask participants for recommendations of acquaintances who might qualify for participation (Robinson, 2014). Also, applying snowball sampling allows researchers to gain access to hard to reach participants and reaching participants for sensitive information (Waters, 2015). I used snowball sampling to ask participants to

refer other potential candidates who used successful mitigation strategies to reduce technostress with their employees.

Researchers use various methods to gain access to participants. LaGasse (2013) mentioned that contacting recruits directly to gain access to participants who meet research study requirements. I contacted logistics managers directly through the two publically available mentioned strategies and from eligible referrals to participate in developing mitigation strategies for reducing technostress via telephone and e-mail. Using these methods ensured I had participants who had successful mitigation strategies for reducing technostress and improving employee productivity. During the initial conversation, I emphasized to potential participants that this was a Walden University study to delineate it from consulting sales studies and pointed out that their participation would help the leadership development of future logistics executives. Next, I exchanged contact information to schedule a callback appointment and provided an invitation letter to participate (Appendix C) to the selected logistics managers.

Working Relationship with Participants

I established a working relationship with participants through scheduled callback appointments, face-to-face meetings, or Skype video calls with logistics managers. During the follow-up conversation, a discussion of my business problem, purpose of the study, and exchange of professional experience occurred to provide background and to place the participants at ease. Building trust and promoting openness from participants, as recommended by Morrison, Gregory, and Thibodeau (2012) created a working relationship with them.

Other efforts to establish a working relationship with participants included organizing interview schedules to accommodate participants' availability and selecting locations acceptable to all the participants, which provided an environment of mutual respect. I coordinated opportunities for face-to-face interviews with logistics managers for mitigation strategies. My efforts to build rapport created an atmosphere and working relationships where logistics managers felt at ease to share information about the event of technostress. Building rapport and trust with participants helped the respondents to answer the overarching research question, which aligned with concepts from Elo et al. (2014) and Pérez, Mubanga, Aznar, and Bagnol (2015) that support qualitative rigor and trustworthiness.

Research Method and Design

I used qualitative research method and an exploratory multiple case design to explore the mitigation strategies that logistics managers in distribution centers located in the Los Angeles County, California area used to reduce technostress with their employees. Snyder (2012) noted that applying qualitative research methods and an exploratory case design provides for a richer and deeper understanding of the situation. Using a case study design allowed me to explore the variation of characteristics linked with technostress, which Yin (2014) reported allows for replication, comparison, and contrast of cases. Implementing qualitative research methods and a case design led to insights on the perspectives of logistics managers involved in the episode of technostress through semistructured interviews and collection of publically available artifacts

including documents, such as productivity assessment tools, ICT system training materials, and technostress mitigation instruments.

Research Method

Researcher select a method for conducting research by determining which method provides the best means to explore the phenomena. Qualitative research methods enable researchers to explore the multifaceted experiences of human behavior in the daily lives of participants (Erlingsson & Brysiewicz, 2013). I used the qualitative research method to explore the events of how technostress affects employee productivity in a large distribution center. Marshall and Rossman (2016) mentioned that qualitative research is ideal for enhancing data into themes and generalizations. Erlingsson and Brysiewicz (2013) outlined that quantitative researchers seek the truth, measure information numerically, and strive to minimize variation in studied phenomenon. Qualitative researchers search for maximum variation in data, look at human realities, and point toward emergent information to determine the relationship between data and observation (Erlingsson & Brysiewicz, 2013; Leedy & Ormrod, 2014). Applying a qualitative research methods provides a mechanism to understand information and to gather data from a close-up view, and in a descriptive fashion to give a richer understanding within an identifiable local context (Petty et al., 2012). Using a quantitative method was not adequate for the research study because this type of method does not allow for exploration of the experiences of participants nor provide an understanding of their viewpoints of the situation. Implementing a qualitative research method for my research

study provided the best means to explore the phenomena of technostress' effect on employee productivity.

Scholars, who consider both qualitative and quantitative methods, may find both have merit for conducting a research study. Mengshoel (2012) noted that mixed-method research (MMR) is the combination of both qualitative and quantitative methods. In mixed-methods, scholars use convergence and integration to mitigate the shortcoming of a single method by combining the best of both. While MMR offers the best method to triangulate quantitative and qualitative data, it requires having extensive knowledge and understanding of both qualitative and quantitative methods (Mengshoel, 2012). Hence, I found using qualitative research would afford me the best method to gain a close-up view, a deeper, and richer understanding of how technostress negatively affects employee productivity. Neither quantitative methods nor MMR were sufficient for this study.

Research Design

I selected an exploratory, multiple case design as the best approach to conduct my research study. Yin (2014) noted that a case study design allows researchers to replicate, compare, and contrast cases. Using a case study design illustrates the multilevel, multidimensional characteristics associated with the phenomena under study in the context of participants' authentic setting (Snyder, 2012). A case study research has five components: (a) study question, (b) study propositions, (c) unit of analysis, (d) linkage of the data to propositions, and (e) criteria for interpreting the findings (Yin, 2014). In case study design, the unit of analysis is an individual person, small group, community, decision, program, or organizational change (Bernard, 2013; Singh, 2014; Yin, 2014). In

my case study design, logistics managers represented the main unit of analysis. The large distribution centers where technostress affects employee productivity represented the contextual conditions about the case. Applying a case study design offers the best opportunity to explore the in-depth experiences of participants for a richer and deeper understanding of the case (Snyder, 2012). Implementing a multiple case design allowed me to determine the proposition on how the circumstances of technostress affected employee productivity at six large distribution centers. A case study design can be used to accents the experiences and interpretations of occurrences through a practice of interviews (Bernard, 2013). Using a case study design led to the emergent themes and mitigation strategies from logistics manager to enhance employees' productivity. Finally, applying a case study design provides rich description and captures the conditions of daily situations and explores the interconnectedness of individuals (Snyder, 2012; Yin, 2014). I used aq multiple case study design to explore the common case conditions of technostress' effect on productivity and the inter-connectedness of logistics managers to determine mitigation strategies with data gathered from six large distribution centers.

In contrast, narrative researchers focuses on the experiences or stories of a single individual. For these reasons, using a narrative design may raise concern about the credibility and transferability of the study due to issues with data manipulation, validity, and reliability (Erlingsson & Brysiewicz, 2013). In addition, applying a phenomenological research design requires prolonged interviews to achieve data saturation from recruits and has issues with bias management linked to improper bracketing (Moustakas, 1994).

Likewise, the subculture divisions and prolonged engagement linked with ethnography design lead to bias (Jarzabkowski et al., 2015). Other research designs have merit for studying technostress in alternative circumstances. However, applying another research design fails to capture instrumentation rigor or ensure bias management to the degree of case study design (Denzin, 2012; Roulston & Shelton, 2015; Yin, 2014). Thus, applying multiple case study design provides a common method to research the complexities of business issues within the phenomenon and utilizing triangulation of data sources, provides instrumentation rigor, and ensures bias management, which strengthens validity (Denzin, 2012; Yin, 2014).

Other strategies to enhance validity involved using methodological triangulation to enhance data saturation. Data saturation occurs when researchers conduct interviews until there is no new coding, no new information, or no new themes, which allows for replication of research results (Denzin, 2012; Morse, 2015; O'Reilly & Parker, 2013). As part of methodological triangulation, I conducted continuous interviews from logistics managers and collected publically available artifacts including documents, such as productivity assessment tools, ICT system training materials, or technostress mitigation instruments until there was no new information, no new coding, no new themes, and a redundancy of data to ensure replication of results.

Population and Sampling

The Los Angeles metropolitan area includes an estimate of 4,280 logistics managers, who conduct transportation, warehousing, and distribution services (U.S. Bureau of Labor Statistics, 2015). The number of logistics managers in the area seemed

large but there was a pool of eight with mitigation strategies for reducing technostress. The population for this research study was eight logistics managers from six large distribution centers in the Los Angeles County, California area (Appendix D) that succeeded in using strategies to reduce the effects of technostress with their employees. Leedy and Ormrod (2014) noted that purposeful sampling allows researchers to use judgment when selecting participants with criterion based methods. I used criterion-based, purposive sampling in this study to select logistics managers, who meet requirements for research participation. Using criterion-based, purposive sampling to select participants ensures a sample population who meet requirements for research participation (Petty et al., 2012). Applying a purposive sampling aligns with the stated intent of the case study design, and ensures the selection of participants have rich experiences to identify and provide extensive descriptions about the phenomenon (Bernard, 2013; Yin, 2011). I recruited eight logistics managers who have successful mitigation strategies to reduce technostress with their employees. The expertise of participants provided breadth and in-depth knowledge of the case under study (Erlingsson & Brysiewicz, 2013). Population sampling strategies must support the purpose of the study (Elo, et al., 2014). The individual knowledge and the distinctiveness of logistics managers with successful mitigation strategies paralleled the sampling criteria.

Sample Size and Data Saturation

The range of participants for multiple case study research design is difficult to classify for qualitative research (Marshall, Cardon, Poddar, & Fontenot, 2013). The determination of sample size does not have set rules in qualitative research, but depends

on (a) what researchers want to know, (b) what had credibility, (c) what is at stake, and (d) what is useful for answering the research question (Marshall et al., 2013). Singh (2014) defined unit of analysis in case study design as where researchers gather data for the study. The pool of eight logistics managers that succeeded in reducing the phenomenon of technostress in their distribution centers and improved employee productivity provided the population for analysis of the technostress phenomenon.

The intent of sample size planning is to approximate a suitable number of participants for the chosen study design (Rao, 2012). Applying the template of previously cited case studies as justification; I gathered data from a purposive sample of six logistics managers from six large distribution centers in the Los Angeles County, California area since they held the knowledge and expertise within themselves to identify mitigation strategies. Using a sample of six logistics managers out of a population of eight logistics managers provided me an additional case to reach data saturation. Rissanen (2014) conducted a case study using six cases. Brault et al. (2014) selected six cases for a qualitative multiple case study to determine the role of primary health care nurse practitioners. Jayaram, Dixit, and Motwani (2014) used six cases in a multiple case study design to explore key constructs between family-business and supply chain management. Justifying sample sizes from citing similar research designs helps researchers set a precedent to determine points for data saturation (Marshall et al., 2013). Thus, the purposive sample size for this multiple case study contained six logistics managers from six large distribution centers in the Los Angeles County, California area to achieve saturation of data since they had the best knowledge and successful mitigation strategies.

Data saturation occurs when there is no new coding, no new information, or no new themes, which allows for replication of research results from continual interviews with sample participants (Elo et al., 2014; Morse, 2015; O'Reilly & Parker, 2013; Yin, 2014). Marshall and Rossman (2016) mentioned that using multiple interviews helped researchers achieve data saturation. During multiple case research, I ensured data saturation by conducting continual interviews from six logistics managers and I collected data until no new information, no new coding, or no new themes emerged. I conducted continual interviews from participants to reach redundancy in data for replication of the results, which ensured rich, deep, and quality information for comparison and contrast.

Eligibility Criteria and Interview Setting

The approach for determining eligibility criteria for this study necessitates using aspects of Marshall and Rossman's (2016) four concepts for sampling, which include (a) people, (b) events, (c) actions, and (d) processes. In this research study, I recruited six logistics managers from two local publically available business directories and one professional database, who worked in six large distribution centers in the Los Angeles County, California area. As part of the participant recruitment process, I screened logistics managers to ensure they have successful mitigation strategies to reduce technostress with their employees. Following this criterion ensured the sample had the degree of experience required for rich descriptive data. I included participants that met these criteria to enhance reliability and validity. The growth in logistics IT and processes between 2002 and 2012 required firms to upgrade systems and business practices to remain competitive (Bala, 2013; Prajogo & Olhager, 2012). Thus, the events, processes,

and actions of logistics mangers with successful mitigation strategies to reduce technostress provided a viable setting to explore the essence of the technostress phenomenon.

An essential element of the interview setting was to collect data from the participants in an environment where they were comfortable to share their experiences related to the phenomenon in privacy and with confidentiality to protect their reputation. In this study, I interviewed logistics managers at the local library in a private meeting room in a setting where they were comfortable enough to answer questions without fear of others hearing their responses (e.g., Yardley, Watts, Pearson, & Richardson, 2014). I conducted semistructured interviews with six publically recruited logistics managers from six different large distribution centers, and collected publically available artifacts including documents to explore mitigation strategies that reduced technostress with their employees. Goldman and Swayze (2012) noted that using a flexible strategy to schedule interviews allowed for discovering deep information and demonstrate professionalism. I remained flexible when scheduling interviews with logistics managers to accommodate their time and locations.

Ethical Research

In-depth data gathered during case study research requires anonymity, confidentiality, and informed consent to prevent emotional harm due to exposure to participants' experiences (Donges, 2015). Ethical interviewers should advise interviewees on all dangers and risks associated with the research (Yardley et al., 2014). Prior to interviews, I informed participants of their basic rights using an informed consent form to

ensure they receive respect, fairness, non-maleficence, and beneficence as mandated by the National Institutes of Health (NIH) extramural research (National Institutes of Health, 2013). I informed participants about the small risk of stress from interview questions and provided contact information for professional assistance from low to no cost health organizations for counseling. Hence, I fulfilled the NIH's web-based training on ethical considerations regarding the protection of human participants to conduct extramural research and meet internal review board (IRB) standards.

Informed Consent and Participant Withdrawal

The informed consent letter outlined essential Walden University IRB steps in compliance with ethical standards in research and fulfillment of federal regulations. Lin, Wu, Lin, and Lee (2014) obtained signed consent forms before conducting interviews to ensure participants' understanding about the nature and consequences of the experiment. I obtained a signed consent form from each participant before conducting an interview. Donges (2015) mentioned that researchers should notify participants about their rights to withdraw from an interview and refuse to answer questions. I did notify participants about their rights to withdraw from the interview or refuse to answer any question. Finally, as a measure of safeguarding the reliability and integrity of this research study, the invitation letter to participate in research (Appendix C) and the consent form contained statements that the participants did not receive incentives for their contribution. The denial of incentives guaranteed there was no coercion of participants.

Privacy and Security of Information

Maintaining the privacy and confidentiality of interviewees' data ensures participants' information is secure and secret (Donges 2015; Yardley et al., 2014). I ensured participants' information was secure and secret and provided them notification that no one used their name and personal information for any purposes outside of this research project or anything else that could identify them in this research study. Walden University recommended all study protocol, collected data, and consent forms remain secure on a password-protected, encrypted computer for 5 years from completion of research to prevent unwanted exposure. I will maintain all study protocol, collected data, and consent forms on a password-protected, encrypted computer for 5 years. At the conclusion of at least 5 years, I will destroy content from the device hard drive, the research notes, and the signed consent forms by fire. Harper and Cole (2012) noted that usage of participants' personal information occurs as part of member checking and debriefing to validate data. I obtained a Walden IRB approval number (**01-14-16-0363262**) for this study to meet ethical standards. I abided by the outline of the consent form and assigned alphanumeric labels (P1, P2 . . . P6) to protect the anonymity of participants by replacing identifying information. Finally, maintaining participants' privacy and confidentiality safeguards their reputation, and guarantees that the ethical adequate protection of participants.

Data Collection Instruments

Preparation was a vital component for effective data collection. The complexity of data collection requires case study investigators to have the desired skills and values

necessary for successful data collection (Yin, 2014). The basic attributes for case study investigators include (a) asking good questions, (b) being a good listener, (c) staying adaptive, (d) maintaining a firm grasp on issues under study, and (e) avoiding bias (Yin, 2014). Other pertinent skills for successful data collection requires interviewers to develop strategies to understand and describe the interview setting, and master effective interviewing skills for conducting probes and follow-up questions (Xu & Storr, 2012). Interviewers that utilize appropriate (a) data collection instruments, (b) data collection techniques, (c) data organization techniques, and (d) data analysis increase the reliability and validity of their study to ensure credibility, transferability, dependability, and conformability (Elo et al., 2014; Yin, 2014).

Data Instruments

Serving as the data collection instrument and using open-ended semistructured interviews during the interview process allows researchers to gather information for accurate representation of the participants' experiences by summarizing the data and gaining clarification from informants (Erlingsson & Brysiewicz, 2013; Peredaryenko & Krauss, 2013; Xu & Storr, 2012). I served as the data collection instrument and use open-ended semistructured interviews during the interview process to gather information concerning mitigation strategies to reduce the negative effect of technostress on employees' productivity.

Semistructured interview process. The semistructured interview technique has inherent flexibility to use cues for directing the conversation (Petty et al., 2012). I used cues to direct the course of the conversation during semistructured interviews. Bernard

(2013) mentioned that using semistructured interview works well to maintain control and follow new leads during interviews. I used semistructured interviews on logistics managers to maintain control, which allowed both the respondents and me to follow new leads. Successful interviewing requires effective probing to stimulate respondents and produce additional information (Bernard, 2013; Xu & Storr, 2012).

I designed 10 open-ended semistructured questions to induce detail-rich descriptions and reveal participants' in-depth knowledge and experience. The interview questions are in Appendix A. Conducting face-to-face open-ended interviews with participants for 30 to 90 minutes and using transcription logs ensures quality control (Petty et al., 2012). I conducted face-to-face open-ended interviews with participants for 30 to 90 minutes using audiotaping for accuracy, and transcriptions from journal logs. I followed up by conducting Skype video conferencing with participants to make revisions or adjustments as part of member checking to ensure quality control, credibility, and validity.

Using open-ended semistructured interviews has both strengths and weaknesses. The strengths of using case study interviews for my data collection technique are the research questions will invoke detail-rich descriptions and provide flexibility, accessibility, and intelligibility to uncover significant and hidden facts of human behavior (Erlingsson & Brysiewicz, 2013). In addition, using conversational analysis as part of data collection techniques helped with clarification of participants' responses (Irvine, Drew, & Sainsbury, 2013; Roulston, 2014). I employed conversational analysis for clarification of participants' responses. Applying the mentioned techniques to overcome

interview weaknesses ensured accurate documentation of participants' responses, and increase the reliability and validity of the data collection.

Public artifact process. Yin (2014) mentioned that artifacts including documents may represent technological and instrumental physical evidence. Boblin, Ireland, Kirkpatrick, and Robertson (2013) revealed artifacts including documents provide both contextual and facilitative evidence. Gathering data from artifacts requires planning to decide the usefulness of the data source. In this study, I served as the instrument to collect data from publically available artifacts including documents typically not found in other manners to understand technostress from technological devices such as computers, smart phones, tablets, and system applications products (SAP) databases. I used data derived from enterprise resource planning (ERP) systems and data from information system to develop interpretations about how the negative influence of technostress affects participants' daily lives, and to gain insight into technical operations related to technostress. Lastly, I used publically available artifacts including documents such as productivity assessment tools, ICT system training materials, technostress mitigation instruments, and information from technological devices to understand the interconnectedness of informants' interviews and corroborate data for methodological triangulation.

Member checking. Member checking is a quality control process used as part of qualitative research for participant verification to improve accuracy, completeness and validity (Harper & Cole, 2012). Member checking ensures that after transcription the participants acknowledge and respond in their own words (Houghton et al., 2013). Verner

and Abdullah (2012) used multiple sources of evidence for triangulation, created a case study database to store evidence, and conducted data validation through methods such as member checking to ensure rigor of their research. I used a case study database, methodological triangulation, and member checking as a means to ensure quality control, credibility, and validity of the data collection process by conducting interviews, interpreting shared information, and sharing interpretations by providing participants a one- to two-page summary of the key findings to validate my interpretation for accuracy.

Data Collection Technique

The data collection techniques I used for collecting evidence include conducting face-to-face semistructured interviews derived from open-ended questions and collecting publically available artifacts including documents of contextual and facilitative evidence. During my data collection process, the primary means to collect data occurred through semistructured interviews from selected samples of participants. Following qualitative exploratory case study interview protocols and limiting the opportunities for researcher biases was critical for accurate identification of perceptions, opinions, feelings, and actions of participants. Researchers capture the holistic and dynamic aspects of the participants' life within the world of the phenomenon (Erlingsson & Brysiewicz, 2013; Snyder, 2012). I scheduled a face-to-face appointment at the local library in a private meeting room to gain a deep understanding of individuals' experiences. Using a room at the local library provided a setting for gathering rich audio data during semistructured interviews free from outside distractions. My objective was to accommodate participants by scheduling interviews at the time of their convenience.

Key elements for successful interviews include measures such as (a) eye contact with interviewees, (b) quiet locales for interviews, and (c) ensuring interviewees receive genuine care, good listening, and focused questions to keep the interview on track (Jacob & Furgerson, 2012; Yin, 2014). Interviewers place participants at ease and establish ethical guidelines by providing background information on the business problem and exchanges of professional experiences (Bernard, 2013; DeGrezia & Scrandis, 2015; Petty et al., 2012). To establish ethical guidelines during the initial 30 minutes of the 90-minute semistructured interviews, I discussed my business problem, purpose of the study, and had exchanges of professional experience to place the participants at ease.

Another important aspect of effective data collection with semistructured interviews was building trust and gaining informed consent. Building trust helps to extract reflection and truthful comments from the interviewee (Morrison et al., 2012). Gaining informed consent is vital before beginning the interview process (Jacob & Furgerson, 2012). Before conducting interviews, I reviewed the consent form and participants signed the form, which notified them about their rights and confidentiality measures. After obtaining signed consent forms from participants, I conducted interviews with an audio recording device for easier transcription of the interviews.

Conducting audio-recorded interviews is the most recommended method since it provides a database for verbatim transcription and analysis (Peredaryenko & Krauss, 2013). During the interview process, I audio recorded the participants' responses, took written observation notes, maintained attentive listening, and used probes and follow-up

questions to guide the interview process and elicit information. At the conclusion of interviewing participants, audio transcription occurred.

Bernard (2013) recommended staggering interviews to allow adequate observational journaling time. I used an electronic journal to log each participants' information such as (a) organization name, (b) location of the organization, and (c) date and time of the interview. I used publically available artifacts including documents such as productivity assessment tools, ICT system training materials, technostress mitigation instruments, and technological devices that provided contextual and facilitative evidence of the social and environmental realm of the phenomenon.

Conducting follow-up interviews with participants for member checking confirms reliability and provides validity (Irvine et al., 2013; Marshall & Rossman, 2016; Roulston, 2014). I conducted scheduled follow-up Skype videoconferences for member checking to verify interpretations of shared information from participants and shared interpretations with participants to clarify their responses. I also provided participants a one- to two-page summary of the key findings to validate my interpretation for accuracy.

Marshall and Rossman (2016) declared conducting multiple interviews aided researchers in achieving data saturation. I continued conducting interviews and gathering publically available artifacts including documents until there was redundancy in the data collected to ensure data saturation. Summarizing the information gathered during the semistructured interviews helps researchers to manage and organize data for presenting findings (Petty et al., 2012). At the conclusion of the interview process, I organized data from verified semistructured interviews and publically available artifacts including

documents for data analysis to review patterns and trends gathered during data collection and to enhance methodological triangulation to provide research validity.

Semistructured interview advantages and disadvantages. The advantages of using open-ended semistructured interviews for data collection techniques are (a) providing insight about human affairs and (b) allowing the focus to remain on the case study topic (Verner & Abdullah, 2012; Yin, 2014). In contrast, some disadvantages of case study interviews include (a) poor recall, (b) response bias, and (c) inaccurate articulation (Yin, 2014). Another disadvantage of using open-ended semistructured interviews is participants could fail to cooperate with my purpose for collecting data (Roulston, 2014). Using probing techniques and acknowledgment tokens for member checking, which reduces misinterpretations and ensures the accuracy of data helps researchers overcome disadvantages of case study interviews (Irvine et al., 2013; Marshall & Rossman, 2016). I used probing techniques and acknowledgment tokens for member checking to overcome disadvantages of case study interviews.

Public artifacts advantages and disadvantages. The advantage of using public artifacts including documents is they provide a source for collecting evidence generated by technological devices during case study design (Boblin et al., 2013; Yin, 2014). I collected publically available artifacts including documents such as productivity assessment tools, ICT system training materials, technostress mitigation instruments, and data from technological devices (scanners, cranes, and EDI databases), which serves as a means to understand technostress from the social, environmental, and technical lens of the STS framework. Public artifacts including related documents provide additional

evidence to link facts for developing a case study database (Yazan, 2015). I used publically available artifacts including documents to provide evidence linked to technostress and to strengthen methodological triangulation.

A key disadvantage of public artifacts relates to selectivity of data gathered during observation (Yin, 2014). As the single instrument of data collection, I had limited coverage and accessibility to relevant data to select during the data collection process. However, using the multiple data collection techniques allowed me the ability to gather evidence for methodological triangulation, which strengthens construct validity (Yin, 2014).

Piloting a study. LaGasse (2013) noted that a pilot study is a small-scale methodological test conducted in advance of the main study to determine feasibility of methods or ideas in practice. Whitehead, Sully, and Campbell (2014) mentioned that conducting pilot studies should address uncertainties in research. Conducting a pilot study provides helpful information in research, but the pilot research is frequently misunderstood or improperly focused (LaGasse, 2013). While piloting a study has both advantages and disadvantages, I did not use a pilot study. However, ensuring qualitative rigor requires establishing dependability, credibility, confirmability, and transferability (Denzin, 2012; Harper & Cole, 2012; Houghton, Casey, Shaw, & Murphy, 2013). Thus, I used case study design with open-ended semistructured interviews, methodological triangulation, and member checking to ensure dependability, credibility, confirmability, and transferability for qualitative rigor.

Member checking of data. I conducted member checking to validate the interpretation of participants' responses in the study. Conducting interviews, interpreting shared information, and sharing interpretations with participants improves researchers' interpretation and enhances validity (Harper & Cole, 2012; Houghton et al., 2013; Marshall & Rossman, 2016). Throughout the data collection process, I conducted interviews, interpreted shared information, and shared interpretations by providing participants a one- to two-page summary of the key findings to validate my interpretation for accuracy. In addition, conducting follow-up interviews ensures quality control, credibility, and validity (Harper & Cole, 2012). Thus, I conducted follow-up interviews by Skype video conferencing with participants to make revisions or adjustments as part of member checking to ensure quality control, credibility, and validity.

Data Organization Technique

The procedures for data organization required a system to organize and track data collected primarily from semistructured interviews and publically available artifacts including documents. I maintained an electronic journal with organized data using a sequence of repeating steps to maintain reliability and exactness. I audio recorded interview data and wrote observational field notes using a LiveScribe™ pen and software. Using qualitative data analysis tools and computer assisted qualitative data analysis software (CAQDAS) keeps track of data and helps with data organization (Petty et al., 2012). Thus, I used qualitative data analysis tools and computer assisted qualitative data analysis software (CAQDAS) to keep track of data and to aid in the data organization.

I assigned an alphanumeric label to each interview and associated the label assignment with related entries in an electronic journal notes file. The alphanumeric labels supported data tracking and ensured the privacy and anonymity of the participants. In addition to maintaining an electronic journal, I sustained a reflective journal of the review of publically available artifacts including documents for triangulation of all data, which produced rich details of participants' experience with the phenomenon of technostress.

As part of data organization, I used an interview script to conduct face-to-face interviews to ensure consistent interview techniques. Irvine, Drew, and Sainsbury (2013) and Roulston (2014) recommended transcribing data within 24 hours of the face-to-face interview. After completing interviews with each participant, I transcribed the participants' experiences from the exact comments obtained during digital recording within 24 hours of the face-to-face interview. Sotiriadou, Brouwers, and Le (2014) mentioned the value of using computer-assisted qualitative data analysis software for data organization. I used data gathered from interviews and field notes to upload into computer-assisted qualitative data analysis software (CAQDAS).

I uploaded the transcribed interviews in data analysis software to manage textual and audio data. Using NVivo software aided in identifying codes and themes for interpretation to enhance research validity (Sotiriadou et al., 2014). I identified patterns of data within the NVivo qualitative analysis software for categorizing information into emerging themes for data analysis.

Also as part of my data organization process, I created a case study database to organize and document information data. Information gathered from my two data instruments (a) interviews and (b) publically available artifacts including documents to elicit rich details of participant views of a phenomenon. Yin (2014) emphasized using a case study database increases dependability and preserves collected data in a retrievable form for easier analysis. Hence, using NVivo software allowed me to create a separate and orderly compilation of all data gathered during the case study. I did back-up all files as part of data base creation to prevent any accidental loss of data.

Finally, I stored raw data on my home computer supported with an external hard drive. My computer included a password-protected process with a 20-character password only known to me. I secured the study protocol, collected data, and consent forms on my password-protected, encrypted computer, which will remain for 5 years to prevent unwanted exposure. I will then destroy participant interview data by removing all data on the external hard drive.

Data Analysis

The techniques for data analysis in this research study consisted of pattern matching, cross-case synthesis, and systematic text condensation (STC). Yin (2014) noted that pattern matching involved matching the patterns within collected case study data; however, it may not hold up against plausible rival matches. Thus, using cross-case synthesis for exploring and observing patterns for multiple case study methods provides increased synthesis, which diverts plausible rival data (Yin, 2014). In addition, applying systematic text condensation provides a descriptive and explorative method for thematic

cross-case analysis of various qualitative data such as participant interviews and written data related to publically available artifacts including documents (Malterud, 2012). Using STC allows researchers to transfer chaotic data to themes and codes for developing meaningful concepts (Malterud, 2012).

Therefore, I conducted initial pattern matching of interviews and publically available artifacts including documents. Next, I performed cross-case synthesis of collected data for comparison of thematic codes. Thereafter, I synthesized data for developing concepts by applying STC methods during data analysis. Applying the fore mentioned data analysis techniques aligns case study data with stronger data saturation from methodological triangulation, and provides a process for intersubjectivity, reflexivity, and feasibility, while maintaining a responsible level of methodological rigor (Denzin, 2012, Malterud, 2012; Yin, 2014).

Furthermore, I used NVivo software to search for themes and codes and communicated the information rooted in the collected data. Using NVivo software aided in identifying thematic coding and categorizing the collected data during data analysis (Sotiriadou et al., 2014). Using NVivo, a computer-assisted qualitative data analysis software facilitated in revealing hidden trends in data. Finally, using the NVivo software enabled me to search codes to identify all would-be themes for the textural and structural descriptions to create thick interpretative descriptions about the phenomenon related to the negative effects of technostress.

Equally important, I coalesced cross-case synthesis and the STC data analysis techniques with web-based analytic software for codification and thematic reduction to

connect key themes within Trist and Bramforth's (1951) STS conceptual framework. Focusing on key themes and connecting themes with social, environmental, and technical elements identified in my literature review highlighted mitigation strategies to reduce the effects of technostress on employee productivity. My focus was on key themes from informants' interviews and publically available artifacts including documents to identify mitigation strategies, which Kraan et al. (2014) noted that controlled ICT stress and aided leaders with developing greater productivity for competitive advantages. Finally, I connected key themes based on commonalities of participant's experiences with over exposure to ICTs, which Limbu, Jayachanran, and Babin (2014) mentioned causes technostress and affects employee productivity.

Reliability and Validity

Applying qualitative research methods allows me to take part in the study as a research instrument, and focus on depth, richness, and context (Erlingsson & Brysiewicz, 2013). During my exploratory multiple case study, I ensured qualitative rigor to provide scholars the ability to reproduce my study by establishing dependability, credibility, confirmability, and transferability of research findings. Using methodological triangulation provided confirmation of interconnectedness between different data collection sources (Houghton et al., 2013). To address reliability and validity in the research study, I conducted methodological triangulation.

Dependability

The dependability of a research study links to reliability and occurs when an audit trail exists (Elo et al., 2014). I provided an audit trail by listing detailed descriptions of

my research methods such as (a) purpose of the study, (b) discussion of participant's selection, (c) data collection techniques, and (d) research findings. Also, I demonstrated dependability by conducting member checking of the data gathered from interviewees. Member checking is the process where I share and verify the accuracy of the collected data with the interviewee (Harper & Cole, 2012; Marshall & Rossman, 2016). As part of member checking, I conducted interviews, interpreted shared information, and shared interpretations by providing participants a one- to two-page summary of the key findings to validate my interpretation for accuracy. This occurred in various steps of the interview process to ensure quality control of the member checking process.

Conducting face-to-face interviews and continuous follow-up interviews with participants via Skype video conferencing in-depth data collection enriched the academic rigor of this study. Member checking enhanced verification of information to ensure a credible cross-case synthesis of the transcribed data gathered from interviews. The strategy of using methodological triangulation improves data saturation and verification for greater dependability in this study (Denzin, 2012; Verner & Abdullah, 2012; Yin, 2014).

Credibility

The credibility of research relies on a good measurement for internal validity and representative sampling to ensure external validity (Bernard, 2013). Using a case study design with methodological triangulation provides multiple data sources of the phenomenon for the convergence of evidence gathered through interviews and collection of data from publically available artifacts, which strengthens validity (Denzin, 2012; Yin,

2014). Using methodological triangulation during case study research enhances the credibility through comparisons of the results in data collection (Archibald, 2015). In addition, using computer assisted qualitative data analysis software (CAQDAS) such as NVivo to identify codes and themes for interpretation enhances research validity (Sotiriadou et al., 2014). I used NVivo to identify codes and themes for interpretation to enhance research validity. Using multiple sources of data such as interview records and publically available artifacts including documents to find interconnectedness of themes for methodological triangulation of data ensures credibility (Denzin, 2012; Verner & Abdullah, 2012; Yin, 2014). I reviewed various sources of data to include interview records and publically available artifacts including documents for interconnectedness of themes and methodological triangulation of data to ensure credibility.

Transferability and Confirmability

Transferability refers to how well findings of one study are applicable in another context, while still preserving the meanings and inferences from the completed study (Elo et al., 2014; Houghton et al., 2013). Using participants from multiple cases provided data and processes for readers to explore conditions, and understand how to extrapolate and replicate the study in multiple contexts (Elo et al., 2014; O'Reilly & Parker, 2013). However, the reader decides transferability of the research, since the burden of demonstrating a set of findings to another context lies with another researcher (Marshall & Rossman, 2016). I leave transferability of findings to the reader and future researchers.

Confirmability refers to the reflective nature of a study's findings presumed confirmable by others (Elo et al., 2014). I enhanced confirmability of my research study

by limiting bias to establish trust and authenticity. Using open-ended questions and semistructured interviews of logistics managers in the Los Angeles County, California area with successful mitigation strategies for reducing technostress and improving employee productivity provided credibility. Gathering data by interviewing six logistics managers from six large distribution centers allowed for cross-case synthesis. Applying methodological triangulation on interview data and publically available artifacts including documents provided reflexivity of knowledge about mitigation strategies to reduce technostress and improve employee productivity. Finally, I conducted member checking to ensure the accuracy of information and confirmability.

Data Saturation

Morse (2015) informed that using semistructured interviews provides a more limited and restricted description of participants' experiences, which require fewer interviews to reach data saturation than when using open-ended interviews. In addition, O'Reilly and Parker (2013) mentioned that data saturation takes place once no new themes emerge, and coding becomes regular. Data saturation occurs at a certain point during data collection when there is no new coding, no new information, or no new themes, which allows for replication of research results from continual interviews with sample participants (Bernard, 2013; O'Reilly & Parker, 2013). Marshall and Rossman (2016) mentioned that using multiple interviews help researchers achieve data saturation. Using citations from similar research designs helps researchers justify sample sizes, which set the precedent to determine points for data saturation (Marshall et al., 2013). I used semistructured interviews from a purposive sample of six logistics managers at six

large distribution centers to achieve data saturation, since they had successful mitigation strategies and previously cited case study templates achieved saturation with six cases.

In addition, I conducted continual interviews and collected publically available artifacts including documents until reaching redundancy in data, which occurred once findings revealed no new information, no new coding, and no new themes from participants to ensure replication of results. During data collection, I looked for both confirmatory and deviant data through member checking from continuous engagement with participants. I asked interview questions and gathered public artifacts until the data were repetitive to ensure saturation for qualitative rigor, and the synthesis of information answered the research question.

Transition and Summary

The key highlights of Section 2 included a restatement of the study's purpose, defined the role of the researcher, and described selection process of the research participants. Next, I discussed the selected research method and research design. Further areas of discussions included (a) population and sampling, (b) ethical research, (c) data collection, (d) data collection technique, (e) data organization technique and (f) data analysis. Section 2 concluded with a discussion on reliability and validity of the research study. In Section 3, I discussed the presentation of the findings, implication for social change, recommendations for action, application of the study to professional practices, and recommendations for future research studies.

Section 3: Application to Professional Practice and Implications for Change

Section 3 includes the presentation of the findings, application of the study to professional practices, and implication for social change. Section 3 also contains recommendations for action and recommendations for future research studies. I also address my reflections about the research in this section. Finally, this section contains a conclusion of the study.

Introduction

The purpose of this qualitative exploratory multiple case study was to explore the mitigation strategies that logistics managers at distribution centers used to reduce technostress with their employees. According to the study findings, logistics managers take a holistic approach to technostress reduction and incorporate mitigation strategies. The findings from this study included reliance on internal IT experts; hiring temporary experts; maintaining communication and training; using time management skills and organizing priorities; identification and understanding of employee differences; and implementing well-being, fitness, and health programs.

Presentation of the Findings

The overarching research question for this study was the following: What mitigation strategies do logistics managers in use to reduce technostress with their employees? The findings in my study answered the research question. The six themes that emerged from the data included the following: (a) relying upon specialized IT experts within the organization; (b) hiring and training seasonal and temporary IT employees; (c) maintaining communications and training for technology proficiency and

productivity; (d) establishing and evaluating progress toward time management and productivity goals; (e) understanding individual differences related to technology proficiency and comfort; and (f) implementing health, fitness, well-being, and stress reduction programs for employees.

Specialized Information Technology Experts

The first theme was relying upon specialized IT experts within the organization. The majority of the participants (approximately 83% of the sample) discussed the support and assistance that their internal IT teams provide employees to help mitigate technostress in the workplace. Publically available artifacts including newsroom letters indicated that increased work demands, coupled with insufficient staffing; are problems experienced by the companies in this study, but that mitigation strategies included staff support for reducing technology-related problems. Table 2 shows the participants' ideas about relying upon or depending on technical experts who are permanent employees, cited 11 times by five of the six participants in the study.

Table 2

Reference to Internal IT Experts

Reference	Frequency
Help/Assist	38
Team(s)	24
Internal/Within	13
Rely/Depend	11
Expert(s)	10
Support	9

As opposed to reliance upon external experts, which was also a point of discussion, the participants who discussed the benefits of internal experts cited the importance of internal technical experts 13 different times throughout their interviews. Participants used the terms teams (24 references) and experts (10 references) to refer to their internal employees who, through their assistance to other employees, helped to reduce technostress in the workplace. The following excerpts of the interview data represent examples of how the participants in the study use internal IT support to mitigate technostress in their workplaces. P1 said,

> Through the years, we always have IT people who are on hand and a helpline to aid individuals who might hit a wall. It is very easy to reach out to somebody who may be excelling or be a little more technically savvy.

P3 said, "We have our own IT team that handles issues on a regional level. Mitigation team technicians come on site to do what they do to reduce our issues. There is a team in place to mitigate and anticipate." P4 said that to reduce technostress, employees "ask a lot of questions – they go to the people the experts when they don't know the answers." P5 similarly said, "We kind of refer back to subject matter experts." P6 described the "use of integrated product teams comprised of system experts to come and train the staff. The trend now is to hire an expert to perform those functions on a regular basis." P6 added,

> The traditional approach of having experts train dozens of permanent staff in only a few days hasn't been very fruitful and in most cases complicates things. Senior

managers are now hiring permanent employees to perform this task for all programs.

The use of internal IT support to mitigate technostress is a finding that is consistent with previous research by Grant (2014) who showed that there is an emergence of IT support in SCM activities. The finding also aligns with information by Ahmad and Amin (2012) who mentioned that using technical support was among mitigation strategies to reduce technostress. Gorla and Somers (2014) suggested that firms achieve inter-organizational competitive advantages through inter-firm resources by retaining strategic planning and architecture design in-house. Logistics managers rely on the proper IT support architecture for strategic logistical planning and system development. Yeh et al. (2014) found that technology factors such as IT maturity, IT infrastructure, IT human resources, and support from top management influence IT capability. Participants responded that assistance from IT human resources helped to reduce technostress in the workplace. Having internal IT experts is critical for logistical planning and system development to mitigate the subcomponents of technostress. In applying the STS theory to the responses from the participants, logistics managers should consider supply integration aspects such as (a) information automation, (b) work practices, and (c) structural alignment to understand relationships in an organization.

Temporary Information Technology Employees

The second theme was hiring and training seasonal and temporary IT employees. The majority of the participants in the study (approximately 83% of the sample) shared that hiring temporary, seasonal, part-time, and intern staff to assist regular permanent

employees helped to reduce technostress in the workplace. Publically available artifacts including documents, such as company newsletters, indicated that added staffers were mitigation strategies for reducing technology-related problems. Table 3 is a summary of the key terms used to refer to the type of employees who participants hired to help reduce technostress in their organizations.

Table 3

Reference to Hiring Temporary Experts

Reference	Frequency
Seasonal	10
Part-time	10
Temporary	4
Intern	3
Contractors	3

There were four references to temporary employees, 10 references to seasonal employees, 10 references to part-time employees, and three references to interns. The idea of seasonal employees pertained to peak sales times of companies. The idea of interns pertained to hiring college students or technology experts who were new to their business. The participants who discussed interns tried to rehire the same workers on as as-needed basis.

The following excerpts of the interview data represent examples of how the participants in the study used temporary IT experts to mitigate technostress in their

workplaces. P1 discussed hiring temporary workers to take on menial tasks, to reduce the stress on more specialized employees. P1 said, "it may even be with a temp where we eliminate a menial task that anyone can accomplish to allow that person to be freed up to do the things they are specialized to do." P3 said, "If I need to hire additional employees, when you are dealing with certain sectors, we as a policy will add a certain number of employees on a temporary basis just to reduce the added workload on our regular employees." P4 said, "Implementing contractors – people are constantly being brought in through contracting agencies as needed to augment the staffing needs as well." P3 and P4 mentioned the use of outsourcing. P5 said, "We are sending intern support to work with them, and wizards to sit there with them to walk them through, since they are people well-versed with it. We have gotten a handle on the stresses from the complexities." P5 said, "When we're setting up this additional part-time work – we try to go back to the same people- those that have worked for us in the past – students have that seasonal availability – and that's why we go back to students." P6 said, "Historically, senior leadership would hire a systems expert to come and train the staff to perform a complex function or properly use an application."

The use of temporary IT experts to mitigate technostress is an approach consistent with previous research by Gorla and Somers (2014), based on reported evidence of a relationship between the extent of outsourcing and the service quality. In addition, Vieira et al. (2013) mentioned that logistics managers conducting strategic logistical planning and system development with ICT for IT outsourcing must consider process steps such as (a) implementation organization, (b) process setup, (c) technology setup and training, and

(d) external integration and finalization to achieve competitive advantages. Outsourcing for temporary help, contractors, and IT experts may provide value-added services to enhance productivity and reduce stress on employees. The finding coincided with the STS theory because it involved logistics managers who integrated supply factors such as (a) information automation, (b) work practices, and (c) structural alignment to understand relationships in an organization.

Communications and Training

The third theme was maintaining communications and training for technology proficiency and productivity. All of the participants in the study identified effective training as a key strategy used to reduce technostress in the workplace. Related public artifacts including documents, such as updates and newsletters, reflected that computer inexperience, performance anxiety, and the fast pace of change were concerns of the company leaders in the study. However, communication through regular and special meetings revolved around mitigation strategies to improve productivity through enhancing technology proficiencies. Table 4 includes the key terms and references to communications, including meetings that participants felt helped improve proficiency and productivity leading to reduced technostress. There were 40 references to the concept of training. Communication, mentioned 18 times collectively by all participants in the study, related to training, training updates, improvement of productivity in the workplace. The use of regular meetings with employees was also a way mentioned by all of the participants in the study to reduce technostress, referenced on 10 occasions through the interviews.

Table 4

Reference to Communication and Training

Reference	Frequency
Train(ing)	40
Communication	18
Meet(ings)	10
Proficiency	9

The following excerpts of the interview data represent examples of how the participants in the study used communication and training to mitigate technostress in their workplaces. P1 said training could take time and increases stress and increases proficiency, but that "training falls off and you [can] expedite things. The challenge is in the meantime before those new processes or person is in place to alleviate the stress of another but eventually it makes a difference." P2 talked about "training on the platforms we use and [we] again try to limit the number of platforms they have to be adequate on… get them trained up so they can effectively operate within a number of different duties." About training, P2 added, "Training is an ongoing aspect of our business. We routinely send our employees to free one and two day sessions with hardware manufacturers and they learn how to interface – it is an ongoing process." P3 said, "We are just getting ready to change to a totally different system, which will require a lot of additional training on a new system." P4 said, "A lot of training was being offered to make sure they had the skills and knowledge to do their job. It's all about communications so they

can figure out how they're working and what they're supposed to do." P4 added, "There's a lot of knowledge sharing as well as training." About training, P5 said, "We do the training and we try to stay ahead." P6 claimed, "Our firm is big on training. When we can reinforce the training over and over and make it repetitive; our folks learn better when we synchronize training efforts."

Participants associated communication with knowledge sharing related to training, but also associated communication with meetings. For example, P1 talked about "conducting meetings when we are going through a very stressful change. We try to make those plans a month ahead of time so they are communicated earlier than later to avoid confusion and mistakes by communicating in detail." P2 gave examples of the importance of avoiding "communication problems" which could cause stress. P3 said, "You have to have communications up and down the line – communication has to be the key." P4 advised, "Try to have really strong communication opportunities – having regular weekly meetings to find out how people are doing with projects and make sure people were aware of what things were happening with different projects. It's all about communications." P5 said, "The first thing I do is try to use verbal communication and leave that channel open so staff will always have someone to go to and reach out to. It's always about communication – that verbal channel." P6 said, "We have several policies in my firm that deal with how we manage technostress to mitigate communication information stoppages."

Regarding meetings, P1 claimed, "Meetings have been very effective when you kind of bring everyone together, who is affected by the new system." P4 said, "teams are

meeting and reviewing the work that needs accomplishing- a very fluid process that allows you to work through things as they arrive, versus not doing that kind of check until the very end." P5 shared, "We have quarterly meetings and for those who are uncomfortable with upcoming changes, we try to help them feel more comfortable and allow the staff to receive information about how things will change and affect them." P6 similarly stated, "We have weekly meetings and increase the frequency if we need to work closely together."

The findings about communication and training are consistent with previous research on technostress by Hung et al. (2015) who noted that stress derived from computing devices was due to unfamiliarity, uncertainty, and insecurity with technology. Logistics managers use IT for information sharing and KM strategies, which influence innovation and organizational performance (Colin et al., 2015). Once users gain increased familiarity, technological competence rises in the workplace, but extended exposure to technology may elevate technostress levels (Hung et al., 2015). Findings in this study included the idea that the ability to communicate and train employees through knowledge sharing increases proficiency and mitigates techno-uncertainty and techno-insecurity. The findings in this study support the STS theory. Managers that use proactive personality traits to reduce technostress impact communication overload and affect workers' productivity levels (Hung et al., 2015). The social interaction of logistics managers influences the workplace environment. Conducting meetings to train and share information promotes knowledge management related to technology usage and environmental changes in the workplace, which may improve employee productivity.

Time Management and Prioritizing

The fourth theme was establishing and evaluating progress toward time management and productivity goals. Time management was the key strategy that all of the participants in the study claimed could lead to reduction in technostress, cited 46 times in the interview data. Publically available artifacts including documents, such as company newsletters and published company updates reflected that mitigation strategies include planning that revolved around productivity and organization goals.

Table 5

Reference to Time Management and Prioritizing

Reference	Frequency
Time Management	46
Organize	13
Plan(ning)	10
Productivity	9
Prioritize	4

Related to the concept of time management was organization or the ability to organize priorities, or prioritize, together mentioned 17 times throughout the data. Planning was an additional concept related to time management, with 10 references in the data. As listed in Table 5 each of these time management techniques not only was described as lowering technostress, but they were strategies suggested for minimizing the negative effects of technostress on productivity.

About technostress reduction strategies, P6 said, “The best practices are to prioritize work load, distribute work load appropriately.” P4 said, “A lot of times it is just about prioritizing projects when people have multiple projects creating their own stress. Manages have to step in and make sure let them know where they need to focus.” P1 said, “Plan out the day and week and the deadlines and things that need to get done to keep organized with predictability as best as possible. Just trying to make sure work is completed in a timely manner.” P2 advised that to meet “benchmarks and deadlines leaders create protocols, patterns and routines – things they abide by time and time again – creating patterns they can adhere to is the number one thing. It is about managing our own internal expectations.” P3 described,

> Identifying if people are maximizing time appropriately to keep from being stressed then come up with feasible objectives and timelines to make it easier by extending a project a little longer, or finish a project earlier through the usage of additional resources.

P5 spoke about,

> Streamlining complexities to keep up with the fast pace and make sure we [as leaders] are watching and paying attention. Managers have the first eyes on if there is a problem and can help devise a work plan for that employee.

Various tools mentioned by participants helped keep workers organized. P1 said, “All of our systems that have manuals and you can look up the information yourself if you felt like you’re hitting a road block.” P5 described “strategies that we use” such as “our own employee manual handbooks” which P5 claimed are, “resources that staff

always has with hip-pocket tabs with an array of information from our own embedded processes for staff to have lots of visual aids to flip through and keep us from being stagnated by those techno stresses." P5 added, "There is always something physical for them to look at to know what to do if the systems fail. We also have a library where staff can go to and get assistance – there is always publication resources." P6 discussed, "the use of integrated product teams and policy reviews. We try to store information in a central repository. Ironically, these information system repositories often come with their own techno stressors, which often result in stoppages and frustrations."

Time management, prioritizing, and organization are mitigation strategies consistent with previous research by Bala (2013), Connell et al. (2014), and McVicar et al. (2013), who showed the instability of the work environment leads to stress problems associated with job performance, productivity, absenteeism, turnover, and mental health. Factors such as organization transformation, information overload, user training, and malfunctioning ICTs degrade performance and productivity (Connell et al., 2014; Tarutė & Gatautis, 2014; van Deursen & van Dijk, 2014; Whelan & Teigland, 2013). Logistics managers' abilities to plan, organize, and implement time management techniques will lower technostress and improve productivity. The similar finding in this study is consistent with the STS theory because managers address the challenges of technostress, technology overload, and job satisfaction by implementing a holistic view to sway employees with mitigation strategies that enhance productivity.

Understanding Employee Differences

The fifth theme involved understanding individual differences related to technology proficiency and comfort. All of the participants emphasized the role of comfort and proficiency in the development of technostress. The differences that participants referenced pertained largely to perceptions about generational differences, as summarized in Table 6. Although public artifacts reviewed reflected an emphasis on technology proficiency and updates, there were no published references to generational differences found.

Table 6

Reference to Understanding of Employee Differences

Reference	Frequency
Differences	21
Understand(ing)	11
Generation(s)	10
Older/Younger	9
Adjust/Accommodate/Shift	6

While the concepts of differences in comfort levels and proficiency with advancing technologies emerged from the interview data 21 times during the interviews, participants emphasized understanding of the differences on 11 occasions, with 18 references to generations, older, or younger employees. Participants collectively expressed the idea of

adjusting, accommodating, or shifting technology-related work duties to reduce technostress experienced by less proficient employees six times.

About individual comfort levels that participants associated with potential sources of technostress, P6 said, “In my experience, most employees are intimidated by the complexity of some of these systems. The average employees will not learn intricacies. The culture is not understood, but to produce.” The statement reflects the concept of whereby, young people fail to invest time for understanding the culture of technology with a holistic perspective; instead they focus on production outcomes. P6 claimed that to reduce technostress, the systems must be more “intuitive and user-friendly.” P1 talked about matching different proficiency levels of individual users, stating, “We reach out to somebody who may be excelling or be a little more technically savvy with a new system or has already worked on the system who can give assistance to another person.” P2 said, “Managers have to understand when they release a new platform or software application or expect a new type of interface there is going to be a learning curve and employees learn at a different rate.” P2 suggested that leaders, “remain patient, continue to train, being tolerant are ways to reduce stress and help different employees assimilate a little quicker.” P5 claimed that there are some,

> Staff members who feel technology is moving too fast – threatened that I can’t keep up with the speed - we try to bring in help for them so that does not have to be a hindrance to them and so they don’t experience as much stress.

Perceptions about differences in approaches to technology between the generations of workers were topics that participants offered to the interviews. P2 said, “I

don't want to generalize, but some of our older employees that didn't grow up surfing the Internet routinely - the over 50 crowd - tends to lean or leverage more of the 20 something generation to interface with some of these platforms." P2 added, "Once they get a foothold [they] are more willing to use a platform. They become willing to use it, once they're comfortable with some aspects of it, and their learning curve speeds up." P3 said, "On the techno insecurities, I find that to be more so among my much older employees. More so, they prefer to use the more antiquated systems even if its manual." P3 described "younger employees as a different generation" and added that, "as a generational deal, you can't just look at the software integration - you have to look at the employee integration, especially when dealing with older employees." P5 said, "There's a higher level of understanding in the younger generation – they're born into technology – more seasoned staff may be more skeptical - they can get it accomplished without the system – the younger people also need to know that too." P5 clarified the complementary skills offered by "the younger generation" and the "more seasoned staff," adding, "They align with each other – we need them to come together … the technology versus the wisdom."

About seasoned staff, P5 said, "we try to accommodate them throughout the organization – realign them for something that's more suitable to their training and comfort – we want them to be comfortable - we try to reshape their position to make them more comfortable." P5 explained, "We try to retain them … seasoned staff have this big robust world, lots of knowledge, contacts and resources, and other ways to get the job done without having to rely on the system if it fails." P5 added, "Leadership is

responsible for having knowing staff- their strengths and weaknesses. We can discuss as a whole how we can make this more user friendly or sort of accommodate a deficient staff and devise a work plan to help that employee."

The findings are consistent with previous research on technostress by Tarafdar et al. (2014) who noted that technostress' connections with job dissatisfaction and reduced productivity that links to individual experiences and demographics. In addition, the finding aligns with research that reducing the variables associated with technostress improves employee satisfactions by encouraging a supplementary fit between people's values and norms that match the organization (Yan et al., 2013). The theme about understanding differences also encompasses the idea of adjusting, accommodating, or shifting technology-related work duties to reduce technostress experienced by less proficient employees, which aligns with the concept of Kraan et al. (2014) about technological pacing as a mitigation strategy to reduce ICT stress through knowledge sharing and continuous learning.

The findings are consistent with the STS theory because managers could improve the social and environmental conditions in the workplace by understanding the experiences of employees. Understanding of employees can lead to the reduction of technostress exposure to decrease absenteeism and enhance job satisfaction for greater productivity and company profitability (Khalatbari et al., 2013; Shih et al., 2013). In addition, the findings provide insight on how logistics managers interact with the social, technical, and environmental conflicts linked to the negative effects of technostress and job satisfaction, which effect worker's productivity.

Employee Well-being and Health Programs

The sixth theme was implementing health, fitness, and stress reduction programs for employees. The majority of the participants discussed the need for employees to have healthy ways to reduce the types of technostress they experienced from their work, summarized in Table 6. Being able to leave work at work was a way cited by participants in the study for technostress reduction. Documentation to support these findings include work schedules, vacation, personal days, and benefit references, but there were no other public artifacts including documents reviewed that included direct references to actual stress reduction programs in the workplace. Nevertheless, participants cited that health and ways to reduce stress were ongoing concerns for leaders in these companies.

Table 7

Reference to Well-being, Fitness, and Health Programs

Reference	Frequency
Stress reduction (policies and programs)	6
Healthy	5
Physical	4
Fitness	3

Participants who discussed the need for employees to have healthy ways to reduce the types of technostress they experienced from their work emphasized leaving work at work. For example, P6 said, “From a healthy laborer perspective, everyone needs to know when their shift is over. The phenomenon of techno-invasion disintegrated those concepts. Fingertip access to the workplace from virtually anywhere I assume it can be

quite unhealthy." P3 said, "We encourage folks not to take work home… to keep from being stressed out away from work. If they take work home, that could cause other issues, including absenteeism." P3 said, added, "You have to have policies in place for folks to go on vacation where they have the time to deal with their physical needs." P3 suggested that leaders "incorporate into your program a time to conduct physical fitness… instead of sitting for 6-8 hours, giving folks time to actually take a nap at work – the human mind still does not work as fast as software."

In addition to team bonding and collaboration mentioned by all of the participants in the study as a way to reduce technostress, specific stress reduction programs at work were recommendations by two participants in the study. P5 shared the stress reduction benefits of "team bonding kinds of things to help the staff feel at home – not just an organization – but a family unit that exists within the organization." P1 shared similar sentiments, stating, "They have a snack or they bring in a working lunch at that time to make everybody relaxed and informed at the same time."

The strategy to reduce technostress expressed in this theme is consistent with previous research by Bucher et al. (2013) who suggested adaptation of boundaries for home and work ICT usage to limit techno-invasion. The instability of the work environment leads to stress problems associated with job performance, productivity, absenteeism, turnover, and mental health (Bala, 2013; Connell et al., 2014; McVicar et al., 2013). In addition, Saganuwan et al. (2015) noted that technostress causes health ailments and increased health care costs. For this reason, the negative influence of technostress dampens the positive effects of technology-enabled innovation (Tarafdar et

al., 2014). Watson-Manheim and Chudoba (2014) emphasized improved ICT communication and innovative practices as mitigation strategies to change behaviors in the workplace and improve workers' social well-being. The finding support creating boundaries for work and home while implementing physical fitness as a means to reduce technostress. These findings are consistent with the sociotechnical theory because effective productivity relies on internal social, environmental, and technical factors that workers implement to remain efficient from communicative collaboration and adjusting environmental conditions to reduce stressors.

Application to Professional Practice

An important component for firms to achieve competitive advantages requires logistics managers to have linkage to IT for SCM activities (Farahani et al., 2014; Prajogo & Olhager, 2012). Increased technology downtime and disruptions lead employees to experience technostress (Sellberg & Susi, 2013). The business benefit gained from findings in this research study of mitigation strategies for reducing technostress of employees is improved productivity. The results from this study are relevant to professional practice; the findings provide information for understanding how to mitigate technostress while using the STS theory as the lens for logistics managers to gain a holistic perspective to understand the complexities of the phenomena.

Logistics managers' abilities to understand the interconnectedness of how the social, environmental, and technical components of the workplace and employees' behavior amalgamates to facilitate collaboration, knowledge sharing, and increased productivity may improve efficiency. Pasmore (1988) noted that inhibitors of employee

optimization include job dissatisfaction, absenteeism due to stress and poor health, technology overload from over exposure, and disruptions from system downtime. Identification of these inhibitors and implementation of mitigation strategies will allow logistics managers to take action to reduce technostress and improve workplace conditions. The knowledge gained from using STS theory in this study informs logistics managers about the design of new technologies and technology-led change to limit (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty, by facilitating workforce training, well-being programs, knowledge sharing, and technical support.

Implementing workforce training will reduce unfamiliarity, uncertainty, and insecurity with technology to improve productivity. Adding well-being programs, as a mitigation strategy for reducing technostress will lower employer health care costs, reduce employee absenteeism, and improve the mental health of stressed employees, which will reduce employee sick days and a firm's insurance premium payout for employee stress related health care expenditures. Logistics managers that promote knowledge sharing between employees and technical systems by conducting meetings to train and sharing of information will increase knowledge management and collaboration for competitive advantages and improved business practices. Lastly, the findings are relevant for logistics managers' utilization of internal technical support to provide direct assistance to employees and help align IT architecture to reduce technostress in the workplace for competitive advantages and increased employee productivity for greater company profitability.

Implications for Social Change

The research provided useful insights for logistics managers and expanded knowledge of technostress mitigation that makes a positive difference in the lives of their employees. The application of the identified strategies gained from this research study may help logistics managers recognize and mitigate technostress subcomponents (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty to create better work conditions for employees. Logistics managers' ability to recognize technostress will promote social change by increasing awareness and understanding of mitigation strategies for reducing employee absenteeism, burnout, poor performance, poor health, job dissatisfaction, and improving work-life balance. The information in this study helps logistics managers improve employee well-being, better work conditions, and increased productivity for greater company profitability that could produce a more thriving and prosperous community.

Recommendations for Action

Participants in this study identified successful strategies that logistics managers at distribution centers use to reduce technostress with their employees. Current and future logistics managers should pay attention because the business benefit gained from findings in this research study provide enhanced identification of mitigation strategies for reducing technostress of employees. The significance of implementing reliance on internal IT experts and temporary experts, maintaining communication and training, organizing priorities, understanding employees, and implementing well-being programs

may reduce techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

I recommend that businesses synchronize strategic planning of their IT architecture and utilization of IT experts for technostress reduction. Businesses should develop better logistics managers by training them to recognize technostress, implement communication and training measures for technostress reduction, and promote collaboration for knowledge management. In addition, businesses should train logistics managers to understand individual differences related to technology proficiency and comfort for adjusting, accommodating, or shifting technology-related work duties to reduce technostress. Businesses should also implement health, fitness, and stress reduction programs for employees to reduce technostress induced health ailments and health care costs.

I recommend the members of the Los Angeles Customs Brokers and Freight Forwarders Association and Valley Industry and Commerce Association pay attention to the results and share the results with future logistics managers and current distribution center owners at quarterly conferences or training workshops. I will provide participants and interested stakeholders a one- to two-page summary of the key findings to provide logistics managers' mitigation strategies to reduce the technostress of their employees. After approval of the research study, I will inform participants that the full research study is available to those who wish to read it. My final recommendation is that logistics managers in the Los Angeles County, California area share the study results with other logistics managers across the United States to provide useful insights and expand their

knowledge about viable mitigation strategies that reduce technostress and improve employee productivity.

Recommendations for Further Research

Using data from interviews and public documents that I gathered and analyzed from six logistics managers included a sample of the population from six large distribution centers. Future research can use a greater sample size and expand the geographical region of the population and sample to overcome the limitations of this study. Using different research designs such as narrative or phenomenological research design may also lead to additional findings about technostress and mitigation strategies. The analysis presented in this study addressed several technostress subcomponents, which could be the focus of future research, with an emphasis on how research subjects are interpreting this relatively new terminology. Recommendations for future research, based on these considerations and limitations are as follows:

1. Future research can use a greater sample size to explore additional mitigation strategies for reducing technostress and improving productivity.
2. Future researchers may expand the geographical region of the population and sample beyond large distribution centers in the Los Angeles County area to include other regions of the country or other countries in the world.
3. Another opportunity for future researchers could involve using different data collection methods for a case study, such as focus groups. The findings could result in additional findings.

4. A comparison research design study could be done to determine the views between logistics managers and employees. This contrast of views may provide additional themes for a holistic perspectives and consensus building based on the interconnectedness between logistics managers and logistics employees of their perceptions of successful mitigation strategies to reduce technostress.
5. Future research that illuminates the multifaceted experiences and behavior of logistics managers and employees offers an opportunity to validate the findings for mitigation strategies and create better work conditions for employees by reducing technostress exposure for stress reduction and improved productivity for greater company profitability.
6. Future research studies can address each of the technostress subcomponents: (a) techno-overload, (b) techno-invasion, (c) techno-complexity, (d) techno-insecurity, and (e) techno-uncertainty.
7. In future research efforts involving exploration of the technostress subcomponents, there can be an emphasis on techno-overload and techno-complexity, which appeared to present the greatest challenges to logistics managers in this study. The two subcomponents pertained to greater time management, training, identifying organization priorities, and internal IT support.

Future exploration of the two dominate inhibitors (techno-overload and techno-complexity) and how much of an effect each of the identified mitigation strategies has on

the inhibitors would provide guidance to logistics managers about where they should concentrate organizational resources to reduce technostress, improve productivity, and create efficiency for greater company profitability.

Reflections

During the research progression, my skills improved for conducting qualitative case study research and my knowledge base increased for techniques on conducting interviews. Overall, my greatest challenge was during the process of developing strategies for recruiting participants. Gaining access to participants and publically available artifacts required implementing multiple approaches to ensure the privacy and confidentiality of the recruits and their organizations.

Because I conducted in-depth research of the technical terminology associated with the elements of technostress, I was familiar with terms that were not as obvious in meaning to the participants of this study. Therefore, I repeated explanations and definitions of some of the more unique terms used during the interview process. I sometimes paraphrased the answers participants stated and repeated answers back to them to encourage clarification and ensure completeness. I learned the value of conducting follow-up questions to obtain rich data that led to data saturation, which I also learned to recognize.

I learned more about the STS theory and how it can apply to modern research efforts. The findings indicated that applying mitigation strategies with a social, environmental, and technical component may reduce technostress and improve productivity, which aligns with the STS theory because it facilitates a holistic approach to

promote employees' well-being. Using the STS theory allowed me to take holistic view of the technostress phenomenon through supply chain factors that logistics managers face. Managers in this study used strategic logistical planning, new product innovation, buyer-supplier integration, knowledge management, employee performance, and job satisfaction to identify mitigation strategies for use to address the challenges of technostress, technology overload, and productivity. The STS theory in this study has emphasis on social, environmental, and technical subsystems; logistics managers can use these subsystems to gain a holistic understanding of technostress and for implementing mitigation strategies. Social elements of ERP systems pertain to concepts such as team working, personal involvement, knowledge sharing, and distributed decision making.

Through my discussions of mitigation strategies to reduce technostress on employees with logistics managers, I gained an increased understanding of the need of the internal and external collaboration for knowledge sharing as a way to reduce technostress. I learned more about the use of internal IT experts who helped to reduce technostress in the workplace and provide business advantages for increased productivity. Review of the publically available artifacts including documents gave me new perspectives about the significance of senior leadership analyzing ICT data for proper efficiency management, which may affect productivity, job satisfaction, and levels of technostress encountered by employees in certain industries.

Conclusion

This qualitative, exploratory multiple case study led to the identification of mitigation strategies for logistics managers at distribution centers in the Los Angeles

County, California area to reduce technostress with their employees. After conducting cross-case synthesis and the STC data analysis techniques with web-based analytic software for codification and theme reduction, six themes emerged: (a) reliance on internal IT experts, (b) hiring temporary experts, (c) maintaining communication and training, (d) using time management and organizing priorities, (e) understanding employee differences, and (f) implementing well-being, fitness and health programs. I aligned each emergent theme with associated concepts from my literature review and applied the STS theory as a lens for exploration of mitigation strategies related to technostress. My findings from this study represent the most viable mitigation strategies used by logistics managers to reduce the $300 billion annual price tag linked to diminished productivity. Implementing the recommended mitigation strategies will provide businesses with measures for improving employee well-being, better work conditions, and increased productivity for greater company profitability that could produce a more thriving and prosperous community.

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Appendix A: Technostress Interview Questions

1. What mitigation strategies did you use to reduce technostress on employees' productivity?
2. What strategies did you use to improve your employees' ability to perform strategic logistical planning and system development?
3. What were the most effective strategies you use in your center to handle information system interruptions and stoppages when employees conducted new product innovation?
4. What strategies did you use to help employees cope with techno-overload when required to work faster or longer while conducting buyer-supplier integration?
5. How did techno-uncertainty affect knowledge management between logistics managers and logistics workers due to information system changes and updates?
6. How did techno-insecurity affect employee job satisfaction and job performance?
7. How did techno-invasion affect employee absenteeism rate and employee health as it pertains to their ability to perform assigned workload?
8. How did employees cope with techno-complexity from new software or hardware upgrades related to ERP or EDI systems in the organization?
9. How did the senior leadership address technostress in the workplace?
10. What other information about mitigation strategies for technostress would you like to add that I have not asked?

Appendix B: Technostress Interview Protocol

Introduction:

Thank you very much for meeting with me today. I am appreciative for your assistance in helping me completing this study. My name is Robert Penn and I am a student at Walden University working on my Doctor of Business Administration degree in Information Systems Management. I am conducting a study entitled *Mitigation Strategies of Technostress on Supply Chain Management.* The purpose of this study is to explore the mitigation strategies that logistics managers at distribution centers use to reduce technostress with their employees. The results of this study may contribute to effective practices of business by reducing the gaps in understanding how technostress affects employees' productivity. The social implications of this study may include the potential for developing mitigation strategies to reduce technostress.

{Provide participants two copies of the Informed Consent Form to read and sign.}
Do you have any questions concerning the informed consent form to participate in this study?

{*Have participants sign duplicate copies of the informed consent forms before starting interview. Give one signed copy to the participants; keep the other copy for research files}*

Prior to starting the interview read the script:
You have read and signed the informed consent forms. This form explains the purpose of this study. Thank you for volunteering your valuable time to complete the interview. You are encouraged to asked any question or seek any clarifications as you deem necessary. Today, I used a set of questions designed specifically to inquire about your experiences as a logistics manager. The interview may take up to an hour. This interview is confidential, and you are free to withdraw at any time. Any additional information that you share that is significant to this research study may be used; your identity did not be revealed. In the final study, you will be referred to with a distinctive pseudonym code (P1, P2 . . . P6). Do you have any questions concerning the study before we begin?

{Ask to start the digital recorder}
Time of Interview:
Interviewee pseudonym:
Date:
Location of the interview:

[Begin Open-Ended Semi-structured interview questions]

{End of Interview}
Thank the participants for their role in the study and discuss member checking.

{Restate the Skype conference number for follow up questions and concerns from participants}
{Conduct member checking to ensure consistency and accuracy in the data}

{I continued to interview participants until data saturation is achieved}

{I will share the results through a one- to two-page summary of the key findings with participants and interested stakeholders}

Appendix C: Invitation Letter to Participate in Research Forms

Invitation to Participate in Technostress Mitigation Research

Greetings Mr. or Mrs. **XXX**,

My name is Robert L. Penn, and I am a student at Walden University pursing a Doctorate of Business Administration degree. I invite you to volunteer to participate in a research study that focuses on exploring mitigation strategies for reducing the negative effect of technostress on employee productivity. The purpose of this study is to explore mitigation strategies for logistics managers to reduce technostress with their employees. The study conduct procedures include a series of interviews with logistics managers. Your personal information will not be published or shared and remained confidential.

If you are interested in participating in the study, please refer to the attached "informed consent" form. The document provides detailed information to help you understand the study conduct procedures and better assist you in your own personal decision whether to participate. Before the start of an interview, I reviewed the consent form with you and obtain your signature. The Walden University's approval number for this study is **01-14-16-0363262** and it expires on **July 27, 2017**. There is no payment for your participation in this study. However, your participation in this study may help to develop information about mitigation strategies to reduce technostress and improve employee productivity. At the conclusion of my research, I will share the results through a one- to two-page summary of the key findings with participants and interested stakeholders. After reviewing the attached consent form, if you decide to participate in this study, contact me by phone [redacted] or e-mail [redacted].

Thank you for your time and consideration,

Sincerely,

Robert L. Penn, DML (Demonstrated Master Logistician)

DBA Candidate Walden University

Appendix D: Map of Los Angeles County Distribution Centers