

2021

## Strategies to Mitigate Natural Disaster Impact in the Auto Maintenance Business

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# Walden University

College of Management and Technology

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Charles Oluande Ogutu

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2021

Abstract

Strategies to Mitigate Natural Disaster Impact in the Auto Maintenance Business

by

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MBA, Keller Graduate School of Management, DeVry University, 2016

BS, DeVry University, 2014

AAS, Northlake College, 2014

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

March 2021

## Abstract

Many small business owners lack strategies to mitigate natural disasters. Damage caused by natural disasters usually costs millions of dollars in injuries or lost lives, disruption to operations, and property damage. Small business owners who fail to plan and prepare for disaster frequently face closure when disasters strike. The goal of this study was to explore strategies independent auto maintenance business owners use to mitigate natural disasters. Holling's organizational resilience theory grounded this qualitative multiple case study. Five purposively selected participants who implemented disaster mitigation strategies from Texas, Arkansas, and Louisiana participated in this study. Semistructured interviews were used to collect data, supplemented by triangulation using company documents, strategic plans, financial data, emails, website information, and operation manuals. Yin's 5-step data analysis process yielded four themes: employee relations and financial strength, disaster planning and response guideline, communication, and collaboration and partnership. The key recommendation for business owners is to understand, plan, and execute successful natural disaster mitigation strategies to ensure business continuity and resilience. The implication for positive social change is the potential for businesses to avoid permanent business closure, create jobs, retain employees, and improve the economic standard of living for communities.

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## Dedication

I dedicate this study to my wife Anne, and my children Edgar, Fiona, Emmanuel, and Elvis for understanding and support towards my doctoral journey. This dedication cannot be complete without the mention of my grandson Nathaniel and grand-daughters Faraja, Faiza and Fay- all who did not get enough time with me to share the joy of life as they grew up and I struggled on towards this journey. Sincere gratitude of support to my in-laws, Peter, Gideon, Elizabeth, Sammy, Francis, Jane, and the departed Ruth and Odia. To my siblings, Clarice, Jennifer, Donald, Roda and Wycliff and nephews Clive and Kelly. Departed siblings; Benson, Eric, Vincent, Leornard and Kesia. To my late parents Joyce and Nahum and the departed mother and father in laws Fatma and Francis. In pursuing my doctoral degree, I wish to inspire those who come after me that it is never late- determination and perseverance is the key to success!

## Acknowledgments

God is gracious and to him I gave my life, glory, and thanks. Lord God, I requested your company that you walk with me through this journey, and you answered me, engaged me, and lifted me up whenever I was falling short. You said to me “follow this path... for I am with you to the very end of this illustrious journey!” There are times I felt lost and hopeless, but you were there for me. You kept your promise to be with me to the very end and may thy name be praised forever and ever, AMEN!

Thanks to my chair, Dr. Janet Booker for such an illustrious guidance through this doctoral process. You are such an inspiration of what a successful chair should be, and how I wish more students should get the fortune of being guided by you-God Bless You!

I also want to thank and give a glowing tribute to my committee members Dr. Edward Walker and Dr. Lionel De Souza for true selfless unmatched commitment to providing students with excellent feedback. I could not have asked for such a blessing from God, and the best I can do, is to pray for you both in return as I cannot thank you enough!

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## Section 1: Foundation of the Study

Small businesses are important to the economy, yet many small business owners do not prepare for natural disasters in the same way as the leaders of large corporations do (Josephson et al., 2017). Notable impacts from disasters on small business may include (a) physical damage to structures, (b) equipment damage, (c) loss of customer base and sales, (d) losses absorbed by owners such as uninsured losses, (e) loss of income because of business disruption, (f) loss of employees, (g) loss of key suppliers, (h) extended closure or delay in reopening, and (i) lifeline or utility disruption (Sydnor et al., 2017). Superstorm Sandy hit the East Coast of the United States in 2012, and analysts at the U.S. Chamber Foundation's Business Civic Leadership Center estimated that 60,000 to 100,000 small businesses experienced extensive effects (Sullivan, 2017). Business owners should understand risk reduction concepts before a disaster occurs (Cervone, 2017). Business owners who do not plan for and prepare for disasters may face closure when disaster strikes (Hatton et al., 2016). Leaders of corporations who fail to prepare a comprehensive business continuity and disaster recovery plan (BC/DRP) do stakeholders a disservice (Cook, 2015). Small business owners, especially those without effective disaster strategies, may be at greater risk of losing market share in the event of a disaster than are the leaders of large corporations (Federal Emergency Management Agency [FEMA], 2015b; Sahebjamnia et al., 2015). Sharing successful strategies of business owners who have survived disasters may help other business owners avoid business failure or demise resulting from disasters.

## **Background of the Problem**

Natural disasters are a significant challenge to the social and economic resilience of small businesses and communities (Linnenluecke & McKnight, 2017). Disasters are unpredictable, can strike any time, and are a significant threat to the survival and continuity of small businesses. Disasters affect businesses directly through service or product delivery disruptions to customers (Martinelli et al., 2018). Every year, natural disasters impact small businesses in the United States and other parts of the world, costing millions of dollars in the form of injuries or lost lives, disruption to operations, and property damage (Sullivan, 2017). Such was the case when Hurricane Harvey made landfall at Rockport, Texas, on August 25, 2017, as a Category 4 storm with sustained winds between 209 to 251 km/hour and a 2-meter storm surge (FEMA, 2017; National Oceanic and Atmospheric Administration, 2017).

A small business in this study refers to an independent business with fewer than 500 employees (U.S. Small Business Administration [SBA], 2014a). Natural disasters are referred to in the context of earthquakes, floods, and windstorms, while other disasters may be inadvertent events and mishaps, such as power or systems failures or unnatural disasters such as terrorism or civil strife in the labor market, which can cause operation disruption. Deliberate hostile actions, including disasters or accidents, should be of great concern to owners and managers of small businesses. Consumers want their needs to be a priority, and organizational leaders must plan to satisfy consumers' needs, irrespective of disasters. Disasters often strike quickly and without warning, and studies have shown that companies that are resilient or prepared have a far greater likelihood of surviving or

getting back to predisaster positions (Linnenluecke & McKnight, 2017). Small business owners and managers must therefore plan to continue to operate critical functions normally despite adversity or the loss of support systems (Cook, 2015). Business continuity management and business continuity are organizational activities that, if organized and managed properly, can lead to better organizational performances and promote resilience (Kato & Charoenrat, 2018). The consequence of inaction or the lack of a business continuity plan could result in loss of revenue, reputation, information, access to facilities, and personnel (Cook, 2015).

### **Problem Statement**

An estimated 40% to 60% of small businesses that have experienced a natural disaster never reopen (FEMA, 2015). Natural disasters can negatively affect business operations (Linnenluecke, 2017). In 2014, the rates of participation of small businesses in business continuity programs was 14%, compared to 44.9% among larger businesses (Sarmiento et al., 2015). The general business problem is that in the United States, some small business owners lack strategies to mitigate natural disasters. The specific business problem is that some independently owned auto maintenance business owners lack business risk management strategies for disaster management.

### **Purpose Statement**

The purpose of this qualitative multiple case study was to explore the business risk management strategies independently owned auto maintenance businesses use to mitigate natural disasters. The target population consisted of five independently-owned auto maintenance business owners located in Texas, Arkansas, and Louisiana who have

mitigated disaster successfully to avoid permanent business closure. The implications for positive social change include opportunities for small business owners to address natural disaster mitigation strategies, avoid permanent business closure, create jobs, retain employees, and improve the economic standard of living for the local and state communities.

### **Nature of the Study**

Quantitative, qualitative, and mixed methods are the three main types of research methods available for conducting research (Maxwell, 2016). For this study, I chose the qualitative method to explore the business risk management strategies independently owned auto maintenance small business owners use in overcoming the effects of natural disasters in Texas and the surrounding states. Qualitative research is often considered suitable for exploring and understanding the key concepts, perceptions, and experiences related to a phenomenon studied subjectively (Inman et al., 2018) in a natural setting to gain in-depth understanding and access to contextual meanings (Fletcher, 2017; Saunders et al., 2015). Quantitative research involves examining a problem using numerical data, often by comparing groups or examining relationships between variables (Green & Salkind, 2017). The quantitative method was not appropriate for this study because the focus was not on numerical data, comparing groups, or examining relationships between variables. A mixed methods study includes a combination of qualitative and quantitative research methods (Thurman, 2018), and researchers use it to develop a deeper understanding (Saunders et al., 2015). Developing a deeper understanding of numerical

data, examining relationships, or comparing groups were not the focus of this study; therefore, mixed methods research was not suitable.

The qualitative research designs frequently used by researchers are case study, ethnography, and phenomenology (Yin, 2014). Researchers use case study designs to answer *why*, *what*, and *how* questions in a study (Yin, 2014). I chose a case study design to investigate the phenomenon in depth and within its real-world context. A case study involves research to expound on who made and implemented decisions, how, why, and with what results (Schramm, 1971). Researchers use ethnography to gain insight into the understandings of research participants by offering participants the opportunity to share life experiences (Saunders et al., 2015; Wijngaarden, 2017; Yin, 2018), which often requires lengthy field observations, time, and money, which can create a large financial and time investment (Yin, 2018). Ethnography was not suitable for this study because the objective was to explore the business risk management strategies independently owned auto maintenance small business owners use to mitigate natural disaster. Researchers use phenomenological designs to explore the meanings of individuals' lived experiences (Maxfield & Russell 2017) and to explore and describe a phenomenon within a contemporary context (Marshall & Rossman, 2016). Phenomenological research design was not suitable for this study because the focus was not on exploring the meanings of individuals' lived experiences instead of the business risk management strategies independently owned auto maintenance small business owners use to mitigate natural disaster.

### **Research Question**

RQ: What strategies do independently owned auto maintenance small businesses owners use to mitigate natural disaster?

### **Interview Questions**

1. What strategies does your organization have in place to ensure business continuity in the event of a natural disaster.
2. How were strategies to ensure business continuity in the event of a natural disaster communicated within your organization and to the stakeholders?
3. What policies and processes have you used to mitigate natural disaster impact.?
4. How did you address key challenges to implementing your organization's strategies for mitigating natural disaster impact?
5. How did you evaluate the effectiveness of the strategies for mitigating disaster impact in your independently owned auto maintenance business?
6. What information can you share that was not already covered about mitigating natural disaster impact for your organization?.

### **Conceptual Framework**

Organizational resilience was the appropriate theoretical framework to explore the business risk management strategies independently owned auto maintenance businesses owners used to mitigate natural disaster in Texas and the surrounding states. A theoretical framework is the foundation of successful research (Grant & Osanloo, 2014). Canadian ecologist Holling (1973) first used organizational resilience to draw a comparison

between efficiency and persistence in ecological systems and subsequently used it to describe movement between entities such as businesses and municipalities and the government's ability to react and recover quickly from natural disasters (Bastan et al., 2018). Organizational resilience often results from a portfolio of resilience capabilities (Manfield & Newey, 2017) and has developed into a dynamic, complex variable in organizations, taking on many forms, various inputs, and changes (Ishak & Williams, 2018). Resilience in businesses is a strategic initiative that enables performance in any environment and refers to the ability to withstand and recover from tragic events or difficult experiences (Hatton et al., 2016), including how small business managers or owners react and bounce back after disasters (Bastan et al., 2018). Business continuity planning is one part of this broader framework and includes measures intended to address reduction, readiness, response, and recovery (Adekola, 2018; Hatton et al., 2016). Business continuity planning is critical for business operations in the event of a disruption and fits within the planned resilience component as a long-established mechanism intended to enable organizational leaders to manage the impacts of a disaster (Harrison & Williams, 2016; Hatton et al., 2016). Additionally, business continuity management is relevant to the long-term competitiveness of an organization (Hatton et al., 2016; Linnenluecke, 2017). The theory of business continuity management, when applied, may help demonstrate connectivity between existing knowledge and the research question, which will act as the foundation of and liaison between existing knowledge and the problem under study (Grant & Osanloo, 2014).

## Operational Definitions

*Automotive supply chain:* A part of the highly integrated global supply chain exposed to increasing risk of devastating natural disasters (Abe & Ye, 2013).

*Business continuity management:* A risk-management process that planners and strategists use to incorporate a business continuity plan, disaster recovery planning, and crisis management, which includes how to respond to disruptions and how to maintain backup capacity for operational systems (Fiksel et al., 2015).

*Business resilience:* A strategic initiative that enables performance in any turbulent environment and refers to the ability to withstand and recover from tragic events or difficult experiences (Fiksel et al., 2015; Hatton et al., 2016; Linnenluecke, 2017).

*Catastrophic disaster:* An event with an overwhelmingly serious damage impact, such as hurricanes, tornadoes, floods, terrorism, and earthquakes, requiring response and recovery tasks that could well be beyond individual organizations' capabilities (Kapucu et al., 2010).

*Disaster recovery plan:* An implemented form of mitigation strategy for disaster recovery that deals with the preparation for and recovery from a disaster, whether natural or unnatural (Whitman et al., 2014).

*Federal Emergency Management Agency (FEMA):* A governmental organization, formerly independent but currently under the Department of Homeland Security, formed in 1979 to organize responses to catastrophes in the United States (FEMA, 2015a).

*Public-private partnership:* A collective action among public, private, and nonprofit actors for capacity building at local and state levels for effective response to disasters to meet public needs (Garg & Garg, 2017; Kapucu et al., 2010; Radvanovsky & McDougall, 2013).

*Risk management:* A proactive approach a business manager would use to identify, analyze, and manage risks and uncertainties (Cagnin et al., 2016).

### **Assumptions, Limitations, and Delimitations**

#### **Assumptions**

Assumptions are concepts a researcher believes to be true without adequate evidence to support the beliefs (Dikova & Schoenung, 2016; Kirkwood & Price, 2013; Mamman et al., 2018). The scope of research inquiry and findings usually develops from assumptions (Mehmedbegovic & Bak, 2017). The first assumption was that a qualitative study would be an appropriate way to explore factors related to this study. The second assumption was that participants would give truthful answers during the interviews. The third assumption was that independently owned auto maintenance business participants would provide relevant information on strategies used to mitigate the effects of disaster impact in Texas and the surrounding states. The fourth assumption was that data from this study will help readers to understand the strategies to mitigate the effects of disaster impact. The fifth assumption was that the geographic location chosen for this study, which was Texas and the surrounding states, would provide participants the opportunity to contribute to knowledge in the realm of disaster management. Another assumption was

that data triangulation of the interviews and other documents would help to ensure the validity of the assumptions.

### **Limitations**

Limitations refer to factors such as researcher bias that often can change the type of information gathered (Singh, 2015) to influence the outcome of a research study (Sarmiento et al., 2015) and represent weaknesses of the study that negatively affect the reliability, credibility, and generalizability of a research finding (Marshall & Rossman, 2016). This study was limited to Texas and the surrounding states and participants from five independently owned auto maintenance businesses. A limitation was that participants may not have shared all pertinent information during the interview process, thereby limiting in-depth research information. The final limitation was that the COVID-19 pandemic outbreak limited the quick access and availability of the participants for a face-to-face interview, so interviews with participants were limited to teleconference.

### **Delimitations**

Delimitations, or the bounds of investigation in a case study, define the research study scope and boundary set by a researcher and help researchers clarify what a study does not cover (Marshall & Rossman, 2016). This study was delimited to small businesses with fewer than 100 employees that successfully used business risk management strategies to mitigate a natural disaster in Texas and the surrounding states. There was a fear that the interview questions would not produce sufficient data to support the objective of the study. Fusch and Ness (2015) noted that in the initial interview, participants often provide only surface-level information. Interviews were conducted to a

point of data saturation, which is a stage determined by the researcher to reflect the point when no new information or data was being added by participants, as noted by Fusch and Ness. The third delimitation was the potential for bias in the study participants' responses.

### **Significance of the Study**

The increasing number of natural and unnatural hazards is forcing organizations to build resilience against numerous types of disruptions that threaten the continuity of business processes (Sahebjamnia et al., 2018). Hurricane Harvey made landfall in Rockport, Texas, on August 25, 2017, as a Category 4 storm with sustained winds of 209–251 km/hour and a 2-meter storm surge that caused injuries to people and damage to coastal businesses (FEMA, 2017; National Oceanic and Atmospheric Administration, 2017). Having a well laid out and concise business continuity plan that clearly communicates how a business will respond during an event can help mitigate risk and is an effective investment (Blackhurst et al., 2018; Sullivan, 2017; Travelers Insurance, 2019b).

### **Contribution to Business**

Leaders of small businesses may use the findings from this study to improve business practices that relate to the strategies independently owned auto maintenance small business owners could use to mitigate the effects of natural disasters, terrorism, and other catastrophic events in Texas and the surrounding states. Business owners may use the findings to improve understanding of how to prepare for and recover from a natural disaster (Cole et al., 2017).

### **Implications for Social Change**

The identified strategies and processes in this study could be used by business owners to improve participation in business continuity programs and thereby enhance disaster resiliency. Independently owned small business owners could use strategies and processes identified from this study to ensure business continuity and to fulfill customers' needs. The uninterrupted auto maintenance service to the community could result in a positive social change because the community members' mobility needs will be met. Fiksel et al. (2015) suggested that risk management is a process some strategists use to implement business continuity plans and help businesses avoid closure following a disaster. Business continuity could mean continued profit generation for the auto maintenance businesses and could empower the owners to venture into more businesses, creating employment for people in communities. The improved small business survival rate could also ensure continuity in the repayment of any loans from institutions, investors, family, friends, or direct SBA loans granted to small business owners, which may have a direct positive effect on loan repayment default rates. Additionally, improved survival of small businesses may result in more job opportunities, a continuation of income for employees and their families, and a positive contribution to state and local economies.

### **A Review of the Professional and Academic Literature**

The goal of this qualitative multiple case study was to explore the business risk management strategies independently owned auto maintenance businesses use to mitigate

natural disasters in Texas and the surrounding states. The overarching research question was:

RQ: What strategies do independently owned auto maintenance small business owners use to mitigate natural disaster?

This literature review was in alignment with the study constructs and the research problem. The review strategy encompassed scholarly peer-reviewed journal articles, electronic media, and books within various disciplines. Researchers use literature reviews to build a logical framework and to support the research topic (Marshall & Rossman, 2016).

A literature review justifies the research aim through the identification of knowledge gaps (Saunders et al., 2015). A critical analysis and synthesis of the literature provides the context and theoretical framework for research relating to value-added strategies and their application by small businesses (Grant & Osanloo, 2014; Saunders et al., 2015). The literature review in this study served as the foundation for understanding the phenomena surrounding the business continuity strategies independently owned auto maintenance small business owners use to mitigate disaster. The literature review was broad, and the focus was on exploring the strategies independently-owned auto maintenance small business owners use to mitigate disasters in Texas and the surrounding states.

### **Organization of the Review**

The literature review in this study is a critical review of information drawn from scholarly books, peer-reviewed articles, authoritative books, and dissertations relating to

the topic of small businesses in the United States and other countries. Databases searched at the Walden University online library were (a) Emerald, (b) Business Source Complete, (c) SAGE Premier, (d) Social Science Research Network, (e) ProQuest, (f) ABI/INFORMS Global, (g) LexisNexis Academic, (h) Google Scholar, (i) Wiley, (j) Science Direct, (k) Elsevier, and (l) Walden University online library resources. The keywords used to locate literature for this review were as follows: *natural disasters*, *business continuity*, *organizational resilience theory*, *public–private partnership*, *small business preparedness*, *disaster response collaboration*, *recovery plans*, and *small businesses in Texas*. The aim of this literature review is to provide themes and related strategies used in preventing and mitigating business disruptions from a catastrophic occurrence.

The key literature review topics include a broad spectrum of the causes and effects of business continuity disruptions and the strategies applied to mitigate the effects of natural disasters. The key topics of the literature review encompass organizational resilience theory, the phenomenon of service disruptions, and relevant prevention and mitigation strategies. The prevention and mitigation strategies include (a) business continuity planning; (b) public–private partnership; (c) disaster management, prevention, and mitigation; (d) critical infrastructure; (e) communication; and (f) supply chain resilience. I based this review of the literature on natural disasters with a focus on business disruption preparedness within small businesses using three topics: (a) critical analysis and synthesis of the conceptual framework, (b) critical analysis and synthesis of literature and themes, and (c) analysis and synthesis of the literature of supplementary

themes. The literature review concludes with an analysis of the synthesis of themes related to how small business owners in Texas avoided business interruption following the occurrence of a catastrophic event or a disaster.

### **Strategy for Sourcing the Literature**

In a 24-month search process, I identified and evaluated more than 1,000 articles and included more than 250 relevant studies for the literature review. Many of the articles (86.4%) were peer reviewed and published between 2015 and 2020. Only 13.6% of the articles had publication dates of 2014 or earlier.

### **Critical Analysis and Synthesis of the Conceptual Framework**

The purpose of this qualitative multiple case study was to explore the strategies independently owned auto maintenance small businesses owners use to mitigate natural disaster in Texas and the surrounding states. The population for the study was five auto maintenance business owners located in Texas and surrounding states who have continuously operated their businesses for at least 5 years. The implications for positive social change for this study may include a better understanding of the impacts of natural disasters on business continuity and better methods to plan, prepare, and protect against natural disasters, terrorism, or other disruptions of business operations. Distinct groups that may benefit from this research include new business owners or those who have never implemented disaster or business continuity plans, small business owners who may need to update disaster plans, and the general disaster readiness and business community in Texas and surrounding states.

An analysis and synthesis of the literature review with a focus on organizational resilience theory and business continuity strategy served as the lens to understand how small business owners can plan to survive by mitigating disasters. Organizational resilience and business continuity strategies are presented using supporting and contrasting views and theories obtained from the literature. Analyzing and synthesizing other models that supported or contrasted with organizational resilience and business continuity strategies was also part of the literature review.

### **Critical Analysis and Synthesis of the Organizational Resilience Theory**

Researchers have frequently associated resilience with scientific terminology and often considered it a difficult concept to understand (Panpakdee & Limmirankul, 2018). Because resilience lacks a solid theoretical base (Manyena, 2006), it almost becomes a redundant term that offers very little to improve the effectiveness of existing disaster risk reduction interventions or policy formulation. Van Niekerk et al. (2016) noted that scholars and practitioners are often at a loss regarding how to operationalize, quantify, or determine which factors, variables, or indicators make a business or a community resilient.

Linnenluecke (2017) and Sutcliffe and Vogus (2003) indicated that resilience is an inherent characteristic because it is not possible to evaluate the resilience potential of an entrepreneurial firm until it displays a resilient response to a disruptive event. Van Niekerk et al. (2016) emphasized the need for scholars, when using the term *resilience* and its application, to focus on describing the origins and original use of the term to enhance clarity. Organizational resilience, also referred to as business resilience or

operational resilience, is a newer tradition in management theory that incorporates insights from both coping and contingency theories (Koronis & Ponis, 2018).

Sutcliffe and Vogus (2003) viewed resilience as the ability of an organization to absorb strain and preserve or improve functioning despite the presence of adversity. Sutcliffe and Vogus denoted the ability of an organization to recover or bounce back from unexpected events (Matin et al., 2018; Urciuoli, 2015). The British Standard 65000 on Organizational Resilience described resilience as the ability of an organization to anticipate, prepare for, respond to, adapt to, and survive sudden disruptions (Drachal, 2017). Small business managers applying such capabilities may prevent or mitigate disaster effects and may avoid business closure. Alabama Power was able to recover quickly and efficiently from the mass devastation created by Hurricane Katrina; it was able to restore power quickly (Skipper et al., 2010). Skipper et al. (2010) noted that this was due to continuous dedication to contingency planning efforts conducted through implementing a continuous process improvement philosophy within a company. Lengnick-Hall and Beck (2005) incorporated resiliency capacity to include a multidimensional construct based on three organizational components: cognitive (i.e., sense-making, ideological identity), behavioral (i.e., varied action inventory, functional habits), and contextual capabilities (i.e., social capital, network of external resources).

Defining specific organizational resilience attributes regarding how and whether organizations can demonstrate resilience in response to environmental shocks is an ongoing debate among scholars (Linnenluecke, 2017). Resilience has become established in the societal safety and security discourse since 1999, and it has been part of the

academic literature of several scientific disciplines for much longer (Bergström, 2018). Sir Francis Bacon introduced the Latin/Roman term *resilience* into the English language in the 17th century (Alexander, 2013).

Specifically, Holling (1973), a Canadian ecologist, first used the concept of organizational resilience to draw a comparison between efficiency and persistence in ecological systems. Holling defined resilience as the ability of a system to return to equilibrium after a disturbance (Martinelli et al., 2018; Urciuoli, 2015). Holling then used the term to describe resilience in the ability of entities such as businesses, municipalities, and the government to react and recover quickly from natural catastrophic disasters (Bastan et al., 2018). Major storms such as Harvey in Texas and the Gulf coast and Sandy on the East Coast battered cities and damaged businesses' and cities' critical infrastructures, such as power lines. However, within the concept of resilience, most affected businesses or cities have restored functionality.

Holling (1973) referred to resilience as the measure of the persistence of systems and of ability to absorb change and disturbance and still maintain the same relationships between populations or state variables. Panpakdee and Limnirankul (2018) observed that withstanding change and maintaining the original domain is difficult, and that technology and systems can help achieve resilience. Holling (2001) noted that the three critical characteristics needed by individuals or business owners to accomplish resilience are the capacities of learning and adaptation, a high degree of self-organization, and network connectedness.

Further documentation on the origins of resilience in the business and management literature includes seminal papers by Staw et al. (1981) and Meyer (1982). Holling (1996) and Walker and Salt (2006) focused on issues regarding the ability of thresholds to absorb shocks before the existing resilience capacity is breached. The basis of absorbing shocks before exceeding thresholds for businesses is the creation of an absorption capacity for the impacts that may cause setbacks based on costs to replenish or sustain the threshold points once breached. A good example of breaching the threshold point is the Earth's surface. A breach of safe operating space for humanity, based on intrinsic biophysical processes that regulate stability of the Earth system, could be costly. An example is global warming exceeding a certain degree, which may be irreversible (Steffen et al., 2015). A breach of these boundaries could quickly erode the resilience of the Earth's system with catastrophic consequences.

Manfield and Newey (2017) contended that there are limitations to lifting insights from ecology and applying them to the resilience of organizations because organizational resilience has a range of mechanisms different than those available to ecosystems in the handling of adversity. Kingswood (2015) observed that climate change could bring new challenges to information technology managers and business continuity and disaster planners in years to come due to an increase in severe weather phenomena. Additionally, Manfield and Newey noted that understanding how the ecosystem works should include strategies based on future research and planning, surveillance of climate change hotspots, crisis management, sensemaking, and conscious learning from experience.

Small business owners' awareness of climate change impacts is a strategic benefit. Strategies for dealing with climate change impacts generally can be divided into mitigation and adaptation (Stechemesser et al., 2015). In the United Kingdom, the threat of climate change has received confirmation from researchers at the Met Office and Newcastle University, and from E. Hanna, a professor of climate change at University of Sheffield (Kingswood, 2015). Green infrastructure and natural water retention measures are examples of ecosystem-based initiatives the European Commission has advanced to address a variety of policy goals (Faivre et al., 2017). The ecosystem-based context approach for disaster risk reduction aims at improving the condition and resilience of ecosystems in urban, rural, and wilderness areas, which contributes to the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 (Faivre et al., 2017) and other policy objectives ranging from biodiversity conservation to climate change adaptation.

Resilience in ecology relates to the concepts of absorption, survival, and stability that can foster change and functional diversity, all of which hold relevance for entrepreneurial firms (Koronis & Ponis, 2018; Manfield & Newey, 2017). The focus of ecological resilience is the power of the absorption of shocks before deploying remedial action or response. The social-ecological framing of the construct embraces an adaptive governance approach that suits both ecological and organizational systems in responding to change (Walker & Salt, 2012). This can determine whether a business organization survives an interruption.

Returning to the usual equilibrium and stability of a system within known parameters is the engineering emphasis for resilience, first established as a scientific concept through the development of material physics in the 19th century. The engineering emphasis on resilience referred to the capacity of a material (or its shape or construction, e.g., a spring) to absorb energy when elastically stressed and regain its original form with the stress is released, and the capacity was later known as the stress strain model (Bergström, 2018; Woods & Branlat, 2011). Focusing on how a material absorbs stress, the resilience concept is prevalent in engineering applications. The resilience concept represents how the capacity of infrastructure networks can maintain and regain functionality during and after an incident or disaster (Bergström, 2018).

Holling (1996) indicated that the assumption of gaining functionality does not always hold in dynamic ecological environments in which resilience can mean shifting to a different system state. In the psychological context, individuals grow from adversity to become transformed. In a business context, ideas about resilience in engineering correspond to circumstances of shock, which an existing organization can handle using the usual processes or by withstanding the effects of catastrophic events. Engineering resilience involves a return to homeostasis, and psychological resilience refers to how homeostasis changes to include growth through learning (Lengnick-Hall & Beck, 2005).

The concept of resilience emerged in the political debate on the role of critical infrastructure in maintaining societal functions, notably in the context of the oil crisis in the 1970s, when the U.S. government argued for the need for a decentralized energy supply (Bergström, 2018). In a business environment, unexpected events and abrupt

changes often surprise organizations. Natural disasters disrupt supply chains, terrorist attacks shock the public and paralyze financial markets, and industrial accidents have extensive ecological and economic consequences that ripple through supply chains, from raw materials to transportation (Jacka, 2017; Linnenluecke, 2017).

Resilience in the business and management sectors refers to the ability to bounce back from adverse events by adapting business models, strategies, work routines, or organizational structures to new environmental conditions (Linnenluecke, 2015; van der Vegt et al., 2015). The actions of entrepreneurs can result in more resilient organizations and economic systems that withstand disruptions and recover more quickly (McNaughton & Gray, 2017), and resilience can support entrepreneurs during uncertain times or environments. The definition of resilience also stresses the sustainability of function, structure, and identity in a way that highlights maintaining a way of life following an emergency (Adekola, 2018).

The term resilience encompasses individuals and businesses, but researchers have also traced its use to cities, as was the case when disasters struck New Zealand's second-largest city, Christchurch. The city experienced catastrophic earthquakes between 2010 and 2012 that caused several years of aftershocks (Tipler et al., 2017). Wildfires in California and Australia, the earthquake and tsunami that hit Japan, floods in the United Kingdom, and volcanic eruptions in Iceland are also examples of serious disruptions in advanced economies (McNaughton & Gray, 2017). Lean production, risk management, and business continuity are other strategies that supplement resiliency when applied within supply chain networks in small businesses.

Lean production may be conducive to environmental sustainability but a burden to business continuity. Birkie (2016) contended that companies do not need to abandon lean implementation to be resilient against unanticipated disruptive events, as small business owners can use most lean practices to leverage agility to mitigate disruptions. Birkie posited that relationships between operational resilience and lean in mitigating performance losses outweigh the trade-offs. Just-in-time/flow and total productive maintenance lean practices are reasons for the trade-off. Businesses have leveraged limited synergy on the anticipative capability of operational resilience (Birkie, 2016).

Toyota and Sony are examples of businesses whose leaders applied lean practices during a major disaster. During Japan's 8.9 magnitude earthquake and the ensuing tsunami of 2011, the economic sustainability pursued via lean practices disrupted the basic survival goal of business continuity (Eltantawy, 2016). Birkie (2016) noted that a company with a high deployment of resilience functions and a long history of lean implementation is more likely to have better performance following disruption. A prior alternative focus was on risk management, which is insufficient in addressing the increased vulnerabilities, uncertainties, and unforeseen disruptions faced by the global supply chain (Bevilacqua et al., 2018; Fiksel, 2015).

Building resilience is an essential strategic capability (Seville et al., 2015) and is achievable based on the applied method of reintegration following disorganization (Manfield & Newey, 2017). Achieving growth requires focus and investment in resilience across intervention points before, during, and after adversity. Such an approach to resilience when applied by independently owned auto maintenance small business

owners within their supply chain can help build resilience across the board (Koronis & Ponis, 2018).

### ***Supporting and Contrasting Views on Organization Resilience Theory***

Contrasting and supporting theories researchers explored in studies relating to the prevention and mitigation of the effects of disaster impact in the event of natural disasters, terrorism, and other catastrophic events include: (a) dynamic capability theory, (b) psychology resilience theory, (c) identity and organizational mindset theory, (d) equitable resilience theory, (e) collaborative planning theory, and (f) social capital theory.

### ***Critical Analysis and Synthesis of Dynamic Capability Theory***

Dynamic capability theory is a special type of capability that integrates, builds, and reconfigures internal and external resources to address rapidly changing environments (Teece et al., 1997). Linkages to resource-based views are significant, but the specific aim of the dynamic capability theory is moving the literature debate beyond the static nature of the resource-based approach to resilience theory (Martinelli et al., 2018). Martinelli et al. investigated the formative dimensions of organizational resilience through dynamic capabilities theory and social capital displayed by retail entrepreneurs facing natural disasters (e.g., the 2012 Emilia earthquake).

The findings showed that dynamic capability and social capital are instrumental in enhancing organizational resilience (Martinelli et al., 2018). Martinelli et al. (2018) noted the following categories and contributions of dynamic capability theory: reconfiguration, leveraging, sensing, interpreting, learning, and knowledge integration. Martinelli et al. further observed that the social capital of entrepreneurs' resilience changes according to

the temporal phase of the natural disaster under analysis. Small businesses rely on supply chains to deliver services to customers and a resilient supply chain is a competitive advantage (Siegel, 2018).

### ***Supporting and Contrasting Views on Theory of Dynamic Capability***

Eltantawy (2016) applied a dynamic capability conceptual framework to explore the nature of supply management resilience and its role in attaining ambidexterity by making effective trade-offs. Eltantawy adapted Walker et al.'s (2006) definition of ecological resilience to represent supply management ecological resilience. Eltantawy noted the definition connoted that a business owner may often transform their supply chain management practices into a fundamentally new system when the environmental condition changes and makes the existing system untenable. Low and Johnson (2010) observed that, in dynamic environments, the explorative efforts to proactively garner information and develop a quick response to environmental signals are crucial and represent a key capability for firms to compete successfully. The efficient management of information and response by a small business owner can make a difference following a disaster.

Brusset and Teller (2017) noted that small business managers can achieve resilience by mapping relationships between the practices, resources, and processes over which they have control based on dynamic capability theory. There is evidence of the relationship between dynamic capabilities, dimensions, social capital, and entrepreneurs' resilience to natural disasters (Lee et al., 2015). Lee et al. (2015) noted the existence of a more complex set of factors in creating organizational resilience. Such complex factors

may entail disruptive creation capabilities as a driver of change for resilient business owners (Lee et al., 2015).

On global warming and business adaptation to climate change, Stechemesser et al. (2015) analyzed how insurers adapt to climate change impacts and how adaptation relates to corporate financial performance. Using dynamic capabilities theory, Stechemesser et al. (2015) observed that a positive relationship exists between climate knowledge absorption and return on assets (ROA), between climate-related operational flexibility and ROA, and between the total number of adaptation measures and ROA. Small business owners may benefit from knowledge of how climate change affects natural disasters.

Dynamic capabilities theory provides a useful perspective for addressing the question of how organizations can cope with changing environments by adapting to change and creating competitive advantage through renewed resources (Barreto, 2010; Stechemesser et al., 2015; Teece et al., 1997). Stechemesser et al. (2015) demonstrated that dynamic capabilities enable companies to adapt to climate change and allow them to cope with extreme weather events, which is one of the most dominant environmental risks that affect small businesses.

### ***Critical Analysis and Synthesis of Psychological Resilience Theory***

The development of psychological resilience theory began in the 1950s (Luthar, 2015). The initial theoretical consideration was based on examining and understanding why some individuals can withstand or thrive on pressure or changed circumstances

(Fletcher & Sarkar, 2013). Accordingly, early resilience researchers explored why some individuals adapt to circumstances and others get overwhelmed.

Withstanding pressure or changed circumstances involves the ability to manage internal and external resources appropriately to counter adversity. When resilience is developed based on a trait, it often refers to the characteristics that enable individuals to adapt to unexpected events coming their way (Connor & Davidson, 2003). Small business owners with the capacity to manage internal and external resources can better build resilience than can those who lack such skills.

Manfield and Newey (2017) observed that protective factors are resources that predict positive outcomes in the event of adversity. Seligman (2011) noted that individuals with intrapersonal traits project optimism, mental toughness, and signature strengths. Individuals, such as business owners, with psychological capital intelligence portray self-efficacy in exerting control over external events (Bandura, 1997). Individuals or business owners with psychological capital intelligence may also possess a belief system that supports existence theory, life narrative, and environmental protective factors. The individual's protective factors may come from social supports and a sense of connectedness (Masten, 2014).

### ***Supporting and Contrasting Views on Psychological Resilience Theory***

Resilience is specific and not a generalized phenomenon, and scholars have preferred its specific usage and application to circumstance in specific fields (Luthar et al., 2000; Tusaie & Dyer, 2004; Vanderbilt-Adriance & Shaw, 2008). However, resilience is also viewed as a generalized capacity to learn and to act without knowing in

advance the situation or events that need to be acted upon (Linnenluecke, 2017). Business owners can build resilience at multiple points in time across a process of disruption and reintegration, such as disasters (Manfield & Newey, 2017). Small business owners can implement resilience by applying its fundamentals strategically. Manfield and Newey (2017) posited that disruption can lead to disorganization, which can be so severe as to render almost useless the currently available resources for resilience.

There are various approaches to psychology and resilience theory based on traits covering the following approaches: (a) positive and negative emotions, (b) the fixed mindset approach, (c) the growth mindset approach, and (d) the cognitive and behavioral entrepreneurial traits approach. On psychology and resilience theory, Genet and Siemer (2011) defined resilience as the ability to respond, adapt, and start again after adversity. Focusing on trait resilience, Genet and Siemer suggested that trait resilience is a stable personality characteristic that involves the self-reported ability to flexibly adapt to emotional events and situations. Researchers also included the following traits: robust, resourceful, persistent, and perseverant with high motivation and optimism (Fisher et al., 2016).

From a review of extant literature, it was found that a link may exist between people's behaviors and attitudes, which may create connection to resiliency capabilities. The link or connection may vary cognitively, emotionally, or culturally (Adame & Miller, 2016). Individuals and business owners apply the psychological mechanisms by regulating emotions (emotional resilience) and through the application of the flexibility of thought (cognitive resilience). D'Andria et al. (2018) noted a possible relationship

between emotional and cognitive resilience, which may take hold when an individual works around unexpected events or constraints, such as a disaster. Small business owners with emotional and cognitive resilience traits may be able to respond to or work around unexpected events.

Fredrickson et al. (2003) noted researchers view emotions as transitory, affecting the way individuals may react to situations such as disasters. For example, a negative emotion affects and damages the capacity to recover from adversity and generates specific action tendencies (e.g., survival during adverse situations). Positive emotions can undo the effects of negative emotions and allow the cognitive broadening of an individual. Genet and Siemer (2011) observed that people and business owners who exhibit a lack of or little resilience have difficulty overcoming adverse situations because they remain cognitively inflexible and develop depression and negative emotional states. These individuals will have difficulty making sense of failure (Byrne & Shepherd, 2015; d'Andria et al., 2018).

Within psychology and resilience theory, there is a linkage between resilience, identity, and organizational mindset (Ishak & Williams, 2018). In implicit psychology and resilience theory, Dweck (2016) contended that people view their abilities with either a fixed mindset or a growth mindset. Those with a fixed mindset view their personality, moral character, and intelligence as unchangeable. Dweck observed that those with growth mindsets believe that their qualities are simply a starting point for development and are aware that their abilities can improve through effort, strategies, and outside help.

Additionally, people with growth mindsets are resilient, more willing to try something new, and more likely to grow their abilities (Dweck, 2016).

On adaptation and changing environments, Dweck (2016) suggested that people are willing to embrace cognitive flexibility that allows them to distinguish essential information and to adapt to a changing environment. Byrne and Shepherd (2015) agreed that cognitive flexibility broadens the scope of attention and the action repertoire to analyze the situation and increases their learning. In addition, cognitive flexibility enhances the size and range of the consideration set for a choice and helps entrepreneurs select, reject, and put in perspective relevant information and materials before deciding (Genet & Siemer, 2011). Small business managers with such traits may respond and adapt to changing environments more readily than those with a fixed mindset.

### ***Critical Analysis and Synthesis of Equitable Resilience Theory***

Equitable resilience theory is a middle-range theory that researchers use to explore if and how resilience thinking in practice has addressed equity in the context of intersecting development, disaster risk management, and climate change adaptation (Matin et al., 2018). Equitable resilience is a form of resilience that is increasingly likely when researchers use resilience practice to consider issues of social vulnerability and differential access to power, knowledge, and environmental sustainability (Matin et al., 2018). The view of equity in the context of intersecting development, disaster risk management, and climate change adaptation may support the theory based on Olsson et al.'s (2015) view that systems ontology at the center of resilience serves as a barrier, rather than as a bridge, to social science. The significance and argument of equitable

resilience theory that the ontologies of social science's grand theories do not necessarily imply that integration and contextualization may unravel in application (Betz, 2016).

As there are theories that have greater explanatory potential at the grand level and theories that are relevant at the middle range, the defining point of middle-range theory is that it is empirically testable (Matin et al., 2018). Researchers work on theories that can help the development of disaster risk policy, stakeholders' management, and development. In doing so, researchers engage with the world through the lens of problems with specific contexts for better results (Matin et al., 2018). Scholars have pointed to the need for a middle-range resilience theory that may serve decision makers to engage with questions of equity (Chelleri et al., 2015; 2016).

### ***Supporting and Contrasting Views on Equitable Resilience Theory***

Researchers have linked resilience to development, adaptation, and disaster management, but also have received criticism for failing to address social vulnerabilities on issues dealing with equity and power (Matin et al., 2018). Elmqvist (2017) noted that resilience is not the appropriate goal for policy framing as sustainability, but instead a search for transformation, how governance operates to frame problems, and potential solutions. The contribution of equitable resilience could be viewed as a guide to engage with arising questions when business leaders invoke resilience in practice in support of the development of systems that are responsive to change and socially just (Chelleri et al., 2015). Operationalizing equitable resilience requires policy and practitioner stakeholders to engage with the politics of social, cultural, and political change (Matin et al., 2018). Although engaging with the politics of social, cultural, and political change is necessary,

it is a new challenge and is both pressing and necessary. Such equitable resilience adaptation is relevant to global sustainability challenges where risks, in the form of natural disasters, are becoming prevalent (Sullivan, 2017). Small business managers with better environmental knowledge of surroundings can possibly anticipate and implement disaster plans better than those without such knowledge.

### ***Critical Analysis and Synthesis of Collaborative Planning Theory***

Collaborative planning theory is a stakeholder concept, and in a business management context, multiple people have a stake with a community beyond its owners and managers. Small business owners in the private sector sharing planning insights and experiences following disaster can help improve small business resilience. (Fisher, 2017; Forester, 1989; Healey 1997; Hutter, 2016). The collaborative planning theory requires the involvement of all stakeholders in the planning processes on matters affecting them, such as those of disasters and any critical infrastructure protection and small business participation can help improve their resilience (Kumar & Paddison, 2000).

### ***Supporting and Contrasting Views on Collaborative Planning Theory***

Bridging the gap on policy implementation at national and local administrative levels can help improve the participation of small businesses in the implementation of business continuity programs and thereby help improve resilience levels (Hatton et al., 2016). Resilience is appropriate for small businesses and the field of entrepreneurship research. Scholars use resilience synonymously with preparedness, hardiness, persistence, or self-efficacy to explain why some entrepreneur's businesses perform better than

comparative nonresilient peers (Korber & McNaughton, 2017), and this could also help answer how and why some small business owners survive disasters and others do not.

Another dimension of collaborative planning theory is that its application can help foster the operationalization of equitable resilience theory when people apply it to issues affecting them (Matin et al., 2018). Trust is vital for collaboration, as it enhances effective bonding and interaction about collaboration among stakeholders. Collaboration fosters interactions and improves trust among participants (Kumar & Paddison, 2000) and could increase small businesses to participate in FEMA's disaster preparation programs.

### ***Critical Analysis and Synthesis of Social Capital Theory***

Social capital theory is an integrated concept of actual or potential resources gained by an individual or group from a social system or network (Bourdieu, 1986). Koronis and Ponis (2018) have argued that resilience is the accumulated cultural capacity of an organization to make sense of risks and negative events to absorb the pressure and protect the organization's social capital and reputation. Organizations need social capital to improve competitive advantage (Lee et al., 2015; Nahapiet & Ghoshal, 1998).

Researchers have studied social capital and its effects at the organizational level (Chow & Chan, 2008). Social capital extends to team social capital that exists in relationships between team members in organizations and the formal and informal structures within the team (Lee et al., 2015). By applying the social capital concept diligently, small business managers who build teams within their organizations can help improve resiliency toward disasters.

### *Supporting and Contrasting Views on the Theory of Social Capital*

Contributing toward organizational resilience as a formative construct, Dubini and Aldrich's (1991) social capital theory is a good reference point, and its application may help individuals embrace contextual capabilities. Lee et al. (2015) have found that social capital has a positive connection to resilience and can help in trust building, information sharing, and increasing competitive power among businesses. Collaboration and trust are much-needed ingredients of information sharing on the subject of critical infrastructure protection for the benefit of the public and private sectors, municipalities, and federal government agencies on the issue of disaster management (Nguyen et al., 2017; U.S. Department of Homeland Security, 2012a). Small business participation on disaster preparedness through government agencies and relevant industry is a source of resiliency. Lee et al. (2015) observed that social capital theory may serve as a valuable framework and provide greater insight into explaining knowledge-sharing behavior and effective collaboration between businesses. Such shared benefits may be instrumental in disaster preparedness and business continuity implementation for small business.

Lengnick-Hall and Beck (2005) agreed that, while social capital has its origin in entrepreneurs' existing networks, disruptive creation resides in forward-oriented capabilities, potentially enabling a firm to capitalize on environmental changes in ways that create new options and capabilities. Adding to the social capital view, Koronis and Ponis (2018) suggested three fundamental and important aspects that influence organizational resilience and relate to social capital. Kronis and Ponis observed that resilience drivers cannot exist outside a set of social conditions related to the human and

social capital of an organization. The authors' view was that the driver is strongly influenced by the existence of the appropriate human and social capital including trust, error-free cultures, and sharing.

Through collaboration and sharing, small business owners and managers can perfect communication through social media use to help reduce the impact of a disaster. Möller et al. (2018) have recommended using social media to communicate before and after a disaster. Tropical Cyclone Winston hit Fiji in 2016, with winds exceeding 160 miles per hour, causing serious damage to businesses. Businesses leaders and members of the Fiji community did not use social media effectively for communication, resulting in more damage to property and deaths. The ability to access information using social media before, during, and after the disaster was lacking in Fiji and could have made a difference (Möller et al., 2018).

### **Critical Analysis and Synthesis of Literature and Themes**

The purpose of this section was to present relevant articles on lessons learned from leaders who have experienced natural disasters. The articles included studies with a focus on small businesses and solutions developed pre- and post disaster on preparedness and recovery. Proactive leaders establish and maintain appropriate plans and procedures for disaster response (Das, 2018). The important themes are how small businesses in Texas, the Gulf Coast area, and other parts of the world have planned for and responded to disasters. I also reviewed small businesses' emergency management responses to natural disasters, small business closures following a disaster, and small business leadership and how small businesses may overcome natural disasters and found that

organizations with disaster mitigation plans stand a better chance of survival post disaster than those without.

### ***Small Business and Forms of Natural Disasters***

Martinelli et al. (2018) have stated that natural disasters pose unpredictable and significant threats to the continued profitable operations and continuity of small and large businesses, which has the potential of directly affecting the ability to offer products and services to customers. Some forms of natural disasters are hurricanes, floods, extreme heat, earthquakes, drought, severe weather, snowstorms and extreme cold, space weather, thunderstorms and lightening, tornados, tsunamis, volcanoes, and wildfires.

Other ways unexpected events can affect business operations may include disasters such as terrorism or the normal disruption of business continuity resulting from inefficiencies (Ready.gov, 2012). Inadequate responses to natural disasters by federal, local, and state authorities can erode the public's and business community's trust and confidence in public private partnerships (Miller, 2016). The leadership responses at federal, local, and state levels were generally viewed as inadequate when Hurricane Katrina hit the U.S. Gulf region in 2005 (Miller, 2016). Another disaster took place in Japan following the Fukushima Daiichi nuclear reactor meltdown in 2011. Small businesses and the communities affected felt that those in leadership did not respond in a timely manner to mitigate the losses in Japan. Many small businesses are unfamiliar with the minor costs of available preparedness in the form of business continuity planning actions for catastrophic events (Ready.gov, 2012).

### ***Small Business and the Impact of Natural Disasters***

Christchurch, the largest city in the South Island of New Zealand, experienced a 15-month period of powerful seismic activity in 2010–2011. Hatton et al. (2012) discussed the experiences of several Canterbury organizations that had established business continuity plans prior to the Canterbury earthquakes. Hatton et al. explored how effective their plans were and what did or did not work well and noted that planning was required for effective disaster mitigating strategies.

Hatton et al.'s (2016) objective was to explore whether any link existed between effectiveness and processes in preparing the continuity plan and lessons learned. Hatton et al. observed that the effective and required parts of a business continuity plan for both small and large businesses based on the study were identifying critical functions, developing a communication plan, creating information backups, training, and testing. Not all plans work as designed in a precrisis situation. In a crisis and emergency context, communication efforts must sometimes deviate from the planned strategies to suit circumstances (David & Carignan, 2017).

A failure to follow a communication strategy to suit circumstances took place in a rail explosion and fire that destroyed downtown Lac-Mégantic in July 2013 (David & Carignan, 2017). Quebec's public authority had to terminate its precrisis digital plan and adapt an old-fashioned door-to-door and face-to-face communication style to save lives (David & Carignan, 2017). When disaster strikes, effective communication channels are key to managing the disaster effectively (Cole et al., 2017; David & Carignan, 2017).

The case in Christchurch was no different. Respondents in Hatton et al.'s (2016) study pointed to the lack of provision for the impacts of societal and personal disruptions to workers as an example, as the plan dealt with physical resources but not human resources. The Christchurch earthquake inflicted physical damage to business assets other than structures. Hatton et al. suggested that after the Christchurch disaster, planners in organizations and businesses assumed society would continue as normal. In addition, a lack of provision for alternate locations for operation, and employees' inability to locate the disaster recovery information was evident.

Following the 2010–2011 Canterbury earthquake sequence and disaster, Brown et al. (2015) carried out a study of 541 small business owners and explored the impact of inventory loss on small business recovery. Human/organizational impacts such as customer issues, supplier issues, and availability of staff were the most disruptive. External and environmental impacts such as damage to a neighborhood, difficulty gaining access, and damage to ground surface were the next most disruptive (Brown et al., 2015).

Brown et al. (2015) noted that physical impacts were the least disruptive (e.g., structural damage to building, damage to inventory, or damage to office equipment). In a study of 269 businesses impacted by the Canterbury earthquake sequence, 40% of respondents stated that a business continuity plan helped with disaster mitigation (Hatton et al., 2016). Most businesses submitted that structural damage to buildings and local neighborhood damage were more disruptive than damage to the building's contents. However, in the case of Hurricane Katrina, Sydnor et al. (2017) noted that, as the level of

damage increased, the degree of recovery decreased. Brown et al. (2015) suggested that organizations that rented recovered slightly faster than those that owned the properties.

In a study of over 1,000 small and medium enterprises (SMEs) carried out by the New Zealand Inland Revenue Department in 2012 following the Canterbury earthquakes, participants responded using open text answers to the question of what helped businesses respond and recover (Hatton et al., 2016). The importance of preplanning for small businesses was not included. It was therefore not possible to assess the importance of disaster preplanning for small businesses in that study. Hatton et al. (2016) noted that the 2012 New Zealand Inland Revenue Department study findings differed from a study held in the Tohoku region in Japan, where researchers interviewed individuals in 286 companies following an earthquake. Over 70% of interviewees found a business continuity plan to be very or partly effective, which helps in understanding the value of a business continuity plan in the context of a major urban disaster (Hatton et al., 2016).

### ***Small Businesses and Post disaster Recovery Lessons***

Most available literature on small businesses affected by disaster included a focus on businesses that survived (Marshall et al., 2015). Understanding the lessons learned from small businesses that closed and those that remained open following a disaster can help strengthen strategies for increasing business sustainability and continuity. Successful business owners learn from disaster history and patterns to be better prepared for the next one (Samuel et al., 2015).

Sydnor et al. (2017) carried out a study on of 371 opened and 126 closed business following Hurricane Katrina. Sydnor et al. explored the impact of post disaster

damage, loss of lifelines, types of delays in reopening, and cascading damages on business continuity. Sydnor indicated the severity or impact of the damage to physical structures and property may predict business closure or survival (Sydnor et al., 2017).

Flood damage to business assets such as inventory and equipment can be disruptive and cause extensive loss and damage, including disruption to business continuity (VanDevanter et al., 2017). Routine training and exercises are a necessary part of disaster preparedness and business continuity (VanDevanter et al., 2017). Talent disruptions can also occur following a disaster. As an example, Corey and Deitch (2011) suggested that locating qualified employees and experiencing related staffing issues was a major roadblock to small business recovery post-Katrina. Locating qualified employees was the second strongest predictor of business recovery after loss of customers (Sydnor et al., 2017). Such disruption could have long-lasting implications on unfulfilled order deliveries and has the potential to affect customer relations, including market share in the future (Sydnor et al., 2017). Every business faces several risks, including cyber-attacks and disruptions caused by natural disasters (Haji, 2016). The impact on small business is evident, and the magnitude, vulnerability, and need for small business participation in business continuity programs is critical. Other parts of the world also experience disasters. Auzzir et al. (2018) have noted that, in 2014, Asia experienced 46% of global disasters caused by natural hazards.

The disasters in Asia affected individuals and businesses, from large multinationals to medium, small, and micro enterprises. The magnitude of the 2011 monsoon rainfall mixed with four tropical storms over a period of 158 days precipitated

heavy damages in Thailand (Gale & Saunders, 2013; Yeo & Comfort, 2017); the flood ranked fifth among the 10 most damaging floods in Thailand since 1999, and the affected area ranked eighth in size among that set of floods (Brakenridge, 2019; Gale & Saunders, 2013).

Auzzir et al. (2018) observed that in the 2011 Thailand floods, 557,637 businesses in the flooded areas were affected and 90% were SMEs. In the World Bank report of 2012, analysts estimated that 2.3 million workers lost their jobs because of this disaster. Small businesses are the economic backbone of Thailand's economy, accounting for 98% of total businesses in the country since 2012 (Auzzir et al., 2018). The economic losses incurred were approximately USD 45.7 billion (World Bank, 2012), and small businesses comprised the largest portion.

Typhoon Washi, locally known as Sendong, impacted the Philippines on December 15, 2011, heavily affecting the southern Philippine island of Mindanao, specifically the city of Cagayan De Oro, and caused a serious river overflow (Santiago et al., & Tong, 2018). Effective response to such risks requires the implementation of an effective risk management system that embraces business continuity (Brown et al., & Johnston, 2018).

### ***Small Businesses' Prior Exposure to and Experience with Disaster.***

Experience with and prior exposure to disaster makes a difference, and in a post-Hurricane Katrina study, Marshall et al. (2015) noted that businesses with prior disaster experience and prior cash flow problems were less likely to fail. Marshall et al. noted that the vulnerable groups of small business owners affected were women, minorities, and

veterans, and their businesses were more likely to close after the disaster. The findings also indicated that location mattered, as home-based businesses were also less likely to close, whereas businesses located in coastal counties were more likely to close (Marshall et al., 2015). Small business owners with more industry experience and older businesses were less likely to close, as were larger businesses (based on the number of employees) and service-based businesses.

Marshall et al. (2015) indicated that prior experiences with some type of adversity may provide knowledge and insight that can aid small business owners' subsequent experiences during disaster preparation, response, and recovery periods. Prior experience helps small business owners rebuild and better prepare for the next disaster. Koronis and Ponis (2018) observed that preparedness, responsiveness, adaptability, and learning abilities are organizational drivers of resilience and provide a new direction in crisis management and help in disaster management. However, Abunyawah et al. (2018) posited that awareness creation and education on disaster hazards do not necessarily translate into preparatory thoughts and behaviors toward disaster hazards.

### ***Small Business Disaster Financial Support***

Davlasheridze and Geylani (2017) empirically studied the effects of weather shocks and SBA disaster loans on small business survival. Davlasheridze and Geylani investigated the impact of subsidized SBA disaster loans as a post recovery tool available for small businesses in the United States. Davlasheridze and Geylani explored the effects of floods and the extent to which businesses use these infrequent events as a learning process to update disaster risk plans.

Small businesses benefit from SBA low interest loans for replacing damaged capital and inventory and can rebound quickly (Davlasheridze & Geylani, 2017). In addition, small business loans help households, and there could be an additional stimulus through private household rebuilding, which is good for small businesses (Davlasheridze & Geylani, 2017). In a separate study of small businesses in Bangladesh by Khan and Sayem (2013), findings showed that loans provided before a natural disaster increased resilience and survival after the disaster. In contrast, Davlasheridze and Geylani (2017) observed that SBA loans may create additional problems, such as increasing debt and exacerbating business vulnerabilities. Given the increase of disaster frequencies over the years, small business owners need to engage in disaster preparedness and learning engagements on how they can receive help from the SBA following a disaster.

#### ***Earthquakes' and Tsunamis' Effect on Small Business***

In Japan, following the 2011 9.0-magnitude earthquake and tsunami, Tokyo Electric Power Company experienced nuclear complications at the Fukushima Daiichi power plant. A nuclear accident occurred, causing meltdowns in three reactors due to failed cooling systems in four reactors (Funabashi & Kitazawa, 2012). After the Unit 2 led to a dramatic rise in diffusion of radioactive materials at the nuclear plant, the Japanese government issued a state of emergency, and 3,000 residents living within a 2- to 2.6-mile radius of the reactors were evacuated for fear of a possible explosion and radioactive contamination (Funabashi & Kitazawa, 2012). Any business within that range could also not operate without having a business continuity plan.

Following the disaster, radiation exposure and the continual fear of exposure to other mega-hazards brought outrage and mistrust between the public, businesses, and the government (Miller, 2016). The disaster affected 740,000 small businesses, and many people died. Conservative estimates have indicated that the disaster displaced more than 300,000 employees across 715 industries, which cost USD 209 billion in lost sales (Sullivan, 2017). Because of widespread devastation and a lack of planning by businesses, the Organization for Small and Medium Enterprises and Regional Innovation in Japan arranged for temporary offices for SMEs to lease via municipal government bodies (Sullivan, 2017).

### ***Small Business and Terrorism Threat and Impact***

Business owners invest a tremendous amount of time, money, and other resources to make ventures successful, so it seems natural for owners to take steps to protect those investments. Linnenluecke and McKnight (2017) have noted that larger firms typically have more formalized business continuity planning in place, which can involve both pre- and post-disaster aspects, depending on whether a firm places a greater emphasis on prevention or recovery. Small businesses owners turn to insurance coverage. However, when terrorists strike, as was the case after the events of 9/11, insurance coverage may be insufficient, and businesses may close (Sullivan, 2017).

Twenty-five percent of businesses do not reopen following a major disaster, according to the Institute for Business and Home Safety (Ready.gov, 2012). The effects of disasters like the terrorist attacks of 9/11 or the earthquake and tsunami in Japan may result in disruptions to the supply chain of a businesses, causing loss of customers and a

long way to recovery. In addition to other structural, inventory or other losses, employee talent loss is a possibility when disasters impact them. Private sector preparedness is a cost of doing business in the post-9/11 world that is ignored at a tremendous potential cost in lives, money, and national security (U.S. Department of Homeland Security, 2012 b). The economic consequences of terrorism disasters are real and have led to harm in the United States and foreign countries (Sandler & Enders, 2008). In the United States, terrorism hazards are classified as crimes (18 U.S.C. 113B, §2331; FEMA, 2014b; Setty, 2011); however, there is no international agreement on the definition of terrorism (Purpura, 2019). Terrorism can be international or domestic, and in the United States, both are classified under 18 U.S.C. Federal Bureau of Investigation, and State Department definitions vary from 18 U.S.C. The domestic terrorism definition covers activities that involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any state and that appear to be intended to intimidate or coerce a civilian population or to affect the conduct of a government by mass destruction, assassination, or kidnapping, and occur primarily within the territorial jurisdiction of the United States (18 U.S.C. 113B, §2331).

Terrorism directly impacts a country's ability to attract and maintain business development and investments, which can also have a direct impact on small businesses (Kahan, 2015). Among the sectors impacted in the United States following the events of 9/11 were the aviation industry and the stock exchange, as well as the overall economy (Kahan, 2015; Sullivan, 2017). Terrorism can inflict massive costs on various targets within a country with devastating economic consequences (Sandler & Enders, 2008).

A country may be harmed because business leaders, political leaders, and other global communities divert foreign direct investment from a country targeted by terrorism (Sandler & Enders, 2008). Small businesses rely on well maintained and critical infrastructures that work to full capacity, and when federal, state, or local leaders reduce funding for infrastructure development, small businesses suffer during disaster response. Lack of adequate funding or collaboration between the public and private sectors may also weaken the critical infrastructure small businesses need to respond to or prepare for disasters such as terrorism. Terrorism may destroy infrastructure, causing redirection of public investment funds to security, or limiting trade if a developing country loses enough foreign direct investment, which is an important source of savings (Sandler & Enders, 2008). Small business owners' awareness of available public and private sector terrorism preventive action guidance offered by federal, state, and local leadership is a good step toward small business resilience (Siegel, 2018).

There appears to be much less of a focus on a preventive approach to business continuity targeting terrorism (McIntyre & Hancock, 2013). The preservation of enterprise value includes a focus on catastrophic events that occur more frequently than terrorism, such as hurricane destruction. The 9/11 terrorist events changed how governments and businesses viewed terrorism and the need to plan and prepare sufficiently. Therefore, leaders in the business community need to develop continuity plans as a strategy. Hatton et al. (2016) and Sullivan (2017) suggested that core people are important in a business organization and need protection within an organization. The

supply chain is also important. Being able to fulfill customers' needs is important, but employee safety should be the primary area of focus (Sullivan, 2017).

Since 9/11, governments and businesses have spent much more money, manpower, and time to counter and assuage terrorist challenges on items such as closed caption televisions, concrete barriers, and metal detectors (McIntyre & Hancock, 2013). However, fortifying businesses could have negative results and reduce the number of customers due to fear of being viewed as terrorist targets. Regulations set out by the government, not the business leaders, guide the focus on business continuity following terrorism. Small business owners can focus on innovative technology and a skilled workforce that can leverage government terrorism prevention guidelines to build resilience.

The threat of terrorism is a global phenomenon, and businesses must adjust or conform to the relevant regulations, which may add to the operational costs resulting from risk assessment and prevention implementation (Siegel, 2018). Terrorism has a significant negative impact on businesses (Tingbani et al., 2018). Since the 9/11 terrorist incidence in the United States, pressure to implement business continuity programs has also been growing on SMEs elsewhere.

### ***Small Business and Disaster Planning***

Businesses, irrespective of size, geography, or industry, are likely to be affected by an incident or a disaster at some point (Haji, 2016). Business continuity implementation is instrumental for small businesses to safeguard from disaster, help retain jobs for employees, and reducing socioeconomic impact (Kato & Charoenrat,

2018). The increasing number of natural hazards forces organizations to build resilience against numerous types of disruptions that threaten the continuity of business processes (Sahebjamnia et al., 2018). Businesses can improve resilience through network collaboration within respective industries.

### ***Small Business Leadership***

In addition to effectively managing risk, it is just as important that organizations have effective and empowered leaders at all levels who are trusted and respected and who can make decisions (Business Continuity Institute, 2018a; Hatton et al., 2016). The number of business continuity and business continuity management studies has increased since 1999, particularly since the emergence of e-business (Business Continuity Institute, 2018a). Sandler and Enders (2008) noted that an added cost of doing business is incorporating economic consequences into small businesses' daily operations and ensuring that risk reduction is part of the equation for business preparedness.

There are steps to follow in managing risk, and Brown et al. (2018) indicated that, as a first step, small business owner should carry out a risk assessment to explore threats and vulnerabilities prior to the implementation of a business continuity program. A reasonable number of extant studies have considered business continuity and business continuity management as part of organizational management/organizational strategy (Kato & Charoenrat, 2018). Disasters often occur without warning, and companies whose leaders have prepared have a greater likelihood of surviving (Cook, 2015). Additionally, business continuity management is an organizational activity that, if organized and managed properly, can lead to better organizational performances (Kato & Charoenrat,

2018). In terms of resilience, corporations whose leaders fail to prepare for the inevitable by constructing a comprehensive BC/DRP do a disservice to stakeholders (Cook, 2015).

***Small Business and Public–Private Partnership Participation.***

Despite being concerned about safeguarding their properties, small business owners tend to lack the resources needed to take protective steps to operate effective business continuity (Kahan, 2015; Sullivan, 2017). Leaders in governments and the relevant federal, state, and local agencies should tailor local policies to be conducive for small businesses to engage in disaster preparedness programs. Alexander (2015) found the size of a disaster does not matter, as emergencies are essentially local problems and must be managed on the ground at the local level. Awareness creation and participation by small business owners in business continuity planning, to lessen disaster impacts when they happen, would be a step in the right direction.

Other government intervention methods could help small business owners reduce the impact of disasters on assets when they happen. Kato and Charoenrat (2018) suggested establishing affordable catastrophe insurance policies for small businesses by targeting leading types of disasters, namely earthquake, floods, and terrorism, and extending the policies to loss of business interruption as the first step. Currently, most insurance policies in third world countries and the developing world only cover direct loss of property damage (Kato & Charoenrat, 2018). Thailand established a similar policy for SMEs following the 2011 floods. The provision of discounted premium rates to SMEs with a written business continuity plan may be an effective way of promoting the practice of business continuity management among SMEs and the enhancement of business

continuity management effectiveness (Kato & Charoenrat, 2018). Certification and standardization of the process for SMEs administered by the government agencies in collaboration with the private sector stakeholders could provide managers a way to provide continuity management of small businesses.

### ***Small Business Disaster Preparedness Actions***

There are four steps to developing an effective business continuity plan and achieving the key factors: (a) identify threats; (b) conduct a business impact analysis; (c) adopt controls for prevention and mitigation; and (d) test, exercise, and improve the plan routinely (Sullivan, 2017; Travelers Insurance, 2019b; Weichselgartner & Kelman, 2015). Specifically, preparedness requires organization and knowledge of risk reduction preparation and processes. The steps would include assigning a budget for disaster, maintaining up-to-date information on hazards and vulnerabilities, investing, and maintaining critical business infrastructure that reduces risk like drainage and adaptation to climate change (Weichselgartner, & Kelman, 2015). Ready.gov (2012), suggested that the plan should also include a comprehensive and collaborative approach that protects the business from threats (including natural and terrorist threats and vulnerabilities), and it should be a robust plan that covers different aspects of the organization. The plan should be considered as the foundation small business resilience and should provide a proactive approach from leadership to protect the organization's assets and assist leadership to build resilience (Siegel, 2018).

Brown et al. (2018) reported that planning requires risk identification and management systems implementation based on the risk assessment outcome to help

manage processes in an organization. Linnenluecke (2017) noted that identifying, analyzing, evaluating, and responding to risks and applying analytic techniques to enhance and facilitate the risk assessment and management precipitates an enhanced risk assessment framework within the context of business continuity management. Such preventive measures can help improve business continuity and disaster recovery planning to support efficient and effective resumption and recovery of critical operations after disruptions (Sahebjamnia et al., 2015).

Internal and external disruptions and vulnerabilities influence business continuity (Sydnor et al., 2017), and the business continuity model is one of the disciplines and corporate processes used in managing organizational crises and corporate processes (Koronis & Ponis, 2018). The others are risk management, crisis management, crisis communications, emergency planning, and disaster recovery. Koronis and Ponis (2018) contended that the business continuity models embedded in manuals, processes, and handling strategies often fail to support the survival of organizations following a disaster. Small businesses should exercise drills and practice disaster prevention methods; however, not many small businesses put this into practice (Sullivan, 2017).

***Small Business Leadership and Disaster Risk Awareness.***

Small business leaders benefit from understanding disaster risk awareness (Kandel, 2015). One risk is the chance of a loss of wealth; for example, when disaster strikes a small business, business assets may be damaged resulting in a reduction of wealth for the small business owner (Josephson et al., 2017). The risk awareness process entails the identification and a preliminary classification and prioritization process of an

organization's assets (Siegel, 2018). The risk identification may extend to cover threat identification based on identified assets and risk vulnerabilities (Whitman et al., 2014).

Business leaders rely on the risk identification process to understand how big and how much of a loss they can mitigate or reduce by taking some action (Siegel, 2018). Business impact analysis enables the identification of business sectors that may be impacted and to what magnitude. The impact analysis may require the small business owner to evaluate business operations, including applications and services, employees, servers, and the technology systems within its complex (Lozupone, 2017; Whitman et al., 2014).

Risk recognition and the provision of timely and up-to-date information from reliable sources are the most effective solutions to risk assessment and awareness. Abunyawah et al. (2018) noted that communication variables such as communication source, channel, and message content dictate the effectiveness of conveying risk messages to at-risk individuals and societies. In addition, the source of communication can encompass all people, entities, and institutions, such as public authorities, flood managers, media personalities, friends, family members, and neighbors, who initiate a communication to the public.

It may be of value for small business leaders to understand the disaster risk exposure they face. Risk is not a possibility of something going wrong; it is the probability of a specific adverse event happening, and risk is connected to the value and worth of an item and how it changes over time (Josephson et al., 2017; Whitman et al., 2014). Small business leaders have options to avoid risk where possible and can choose

to act or take a chance and do nothing. Kahan (2015) posited that small business owners lack resources to respond to disasters even if they want to, but risk awareness can be the starting point.

Abunyawah et al. (2018) noted prevention and mitigation plans should address, among other things, emergency response, public relations, resource management, employee communications, and all interested parties. Conducting business impact analysis is necessary to help identify the risk and the possible impact segments within a business and may include the people, locations, suppliers, other providers, processes, functions, and programs critical to the survival of the business (Whitman et al., 2014).

The initial function in developing a business continuity plan is conducting the business impact analysis (Lozupone, 2017; Whitman et al., 2014). The analysis involves investigating, analyzing, and assessing the impact various natural disasters can have on an organization (Cervone, 2017; Lozupone, 2017). Identifying what functions and resources, if interrupted or lost, could impact the ability of small business to provide goods and services or meet regulatory requirements is important (Brown et al., 2018; Cervone, 2017).

Internal training of employees and disaster prevention program development before an event occurs is important and could be the first step in enabling employees to understand the importance and magnitude of disaster preparation (Halkos et al., & Evangelinos, 2018). After an incident, prioritizing the restoration of key personnel and functions is necessary to restore critical operations (Cervone, 2017). Small business owners should allocate and use limited resources wisely as the most appropriate

approach to restoring critical operations. Avoiding complementary functions that can be restored later would be ideal (Cervone, 2017; Travelers Insurance, 2019b).

### ***Small Business Test, Exercise, and Routine Plan Improvement***

Testing and training are crucial to a successful BC/DRP for small business. A BC/DRP becomes obsolete if not tested periodically (Kandel, 2015). Changes in employee job function, suppliers, site layout, technology, and staff might alter a plan's various policies and procedures. A business continuity plan is an evolving strategy that should adapt to a company's changing needs and requires at least yearly updates (Cook, 2015; Travelers Insurance, 2019b).

Employee training and exercises that may include discussions or hypothetical walk-throughs of scenarios or live drills or simulations are the key to ensuring a plan will work as intended (Travelers Insurance, 2019b). Continuous review and evaluation through periodic, realistic testing are necessary to ensure a plan remains effective and valid (Cook, 2015). Small business owners who embrace some form of business continuity strategy stand a chance of preserving their businesses after a disaster.

### ***Small Business Emergency Response, Mitigation, and Recovery***

Small business leaders should assess business risk rather than guessing how to develop a better understanding of how to mitigate risk (Josephson et al., 2017; Whitman et al., 2014). Business continuity plans indicate how to reduce risk before an event, how to respond during an event, and what needs to happen after an event, and the focus of a disaster recovery plan is recovery (Cervone, 2017). These all align with the stages involved in a disaster management program, namely actions before, during, and after

disasters (Randolph, 2015). Safety, restoration of critical personnel, locations, and operational procedures after a disaster are all part of business continuity planning (Cervone, 2017).

The focus of a disaster recovery plan is information technology systems and applications recovery, and the primary driver is a technical perspective. Researchers have acknowledged the role disaster risk reduction plays in mitigating the negative environmental, social, and economic impacts of natural disasters (Shreve & Kelman, 2014). Lozupone (2017) noted that business impact analysis, which is the initial integral part of a business continuity plan, enables a committee to identify critical systems, processes, and functions and investigate the economic impact of a disaster.

FEMA leaders launched a campaign in 2011 called Plan, Prepare and Mitigate that aligned with appropriate actions to apply before, during, and after a disaster (Randolph, 2015). In contrast, the focus of a business continuity plan is the recovery and resumption of business activities across an entire organization (Cervone, 2017), aligning with FEMA's call-to-action campaign, which could benefit small business. Prevention, mitigation planning, and activities can help prevent an event and can help reduce the impact or severity of an event, for example by relocating critical equipment to a higher elevation in flood-susceptible areas (Cervone, 2017; Travelers Insurance, 2019b).

### ***Small Business Insurance and Building Codes***

Another way owners that small businesses can seek mitigation on losses caused by a disaster is through insurance specific to the peril, as preventive actions are better than last-minute reactive (Tribunella & Tribunella, 2018). Location and elevation in flood

zone areas could be beneficial to a small business and it is recommended that high elevated areas in flood zones are better than lower zones for business operations in case of flood disaster. Klotzbach et al. (2018) noted that structures that conform to updated building codes or proper elevations in areas identified in the most current FEMA flood zones often reported minimal damage.

Complying with building codes is essential. Applying and enforcing realistic, risk compliant building regulations and land use planning for businesses and communities can help improve business resiliency (Weichselgartner & Kelman, 2015). Small business owners could use the updated FEMA flood zones map and reports for locations and as a guide for eliminating risk. For example, Klotzbach et al. (2018) noted that the worst flood damage from Harvey in Texas occurred to older structures constructed at ground level, while in Florida, structures built prior to current stringent codes developed after Hurricane Andrew in 1992 performed much worse in areas where Irma's radius of maximum winds occurred.

### ***Small Business and Supply Chain Disruptions***

The supply chain is the lifeline of small business; however, the complexity of supply chains is increasing, and they are becoming much more vulnerable to disruptions (Haraguchi & Lall, 2015). The diversification and existence of global market supply chains in multiple geographic regions exposes companies to disruptions of service delivery (Tse et al., 2016). Furthermore, the number of disruptive events in the global supply chain is increasing and making businesses extremely vulnerable (Chang et al., 2015; Chowdhury & Quaddus, 2016). Authors of a research survey explained that 56%

out of 589 respondents from 76 countries suffered a supply chain disruption in 2018 (Business Continuity Institute, 2018c).

The top causes of the disruptions listed in the report were information technology outages, adverse weather, cyber-attacks, loss of talent and skills, and transport network disruption (Business Continuity Institute, 2018c). Managing supply often chain risk is complicated because of risks that go beyond expected events like weather or terrorism, such as reputational risk exposure arising out of a business supply chain infiltration by faulty or counterfeit parts or business suppliers who make a business go bankrupt. The possibilities are not endless, but they can be extensive (Business Continuity Institute, 2013; Travelers Insurance, 2019a). Because of the frequency of supply chain disruptions that could affect service delivery, small businesses need to apply strategies to mitigate such effects.

Research on supply chain disruptions has increased over the years, and researchers and practitioners have recognized supply chain disruptions' effects on business continuity and competitiveness (Ali et al., 2017; Haraguchi & Lall, 2015; Sheffi, 2015). An alternative focus was on risk management that is insufficient in addressing the increased vulnerabilities, uncertainties, and unforeseen disruptions faced by the global supply chain (Fiksel, 2015); in addition, building resilience is an essential strategic capability (Seville et al., 2015). The rise of terrorism-related risk has motivated companies to develop short- and long-term strategies for their supply chain sustainability and risk management (Khan et al., 2018).

The way businesses set up and plan supply chains prior to a disaster can make a difference in resilience; specifically, predisaster policies such as having alternative transport arrangements and a diversified supplier network positively affect post-disaster sales through service delivery (Cole et al., 2017). Small businesses should use resilient supply chains to reduce the risk of business continuity breakdown following natural and unnatural disasters. Resilience to natural hazards is a function of two interrelated aspects (information and response mechanisms), but what is important is the capacity to exhibit both a planned and adaptive capacity in managing risk and adversity (Siegel, 2018).

Business continuity in the auto service industry cannot be successful without a resilient supply chain (Chang et al., 2015; Chowdhury & Quaddus, 2016). Strong partnerships within the supply chain network are also important, including winning top management support to help improve trust, cooperation, and commitment among supply chain partners. Such arrangements lead to sharing risk or a reduction of risk arising from supply chain vulnerabilities (Chowdhury & Quaddus, 2016).

Business continuity disruption was demonstrated in the auto maintenance industry in March 2011 when a powerful earthquake hit Tohoku in Japan and impacting the auto maintenance industry (Chang et al., 2015). Lee and Pearson (2011) noted that the Japanese domestic auto makers were impacted and shut down for over one month, but also shortage of quake-related sensors affected Hitachi's automotive system factory in Tohoku. The auto parts shortage impact spread to include Germany, France, Spain, and the United States automotive industry were impacted resulting in cessation or curtailment of production of specific types of autos (Lee & Pierson, 2011).

Small business owners, managers and their supply chains need a risk management culture to support the resilience goal because supply chain risk management culture positively influences supply chain resilience (Chowdhury & Quaddus, 2016). Specialized organizational processes and resources are necessary to guarantee resilience at the organizational level (Kamalahmadi & Parast, 2016). Even with specialized processes in place, supply chain risk management is a topical domain that continues to present problems for supply chain managers (Chang et al, 2015),

### **Transition**

Section 1 covered several aspects of this study: (a) the foundation of the study, (b) the background of the problem, (c) a general and specific statement of the problem, (d) the purpose statement, (e) the contextual nature of the study, (f) the research question, and (g) the open-ended interview questions. The purpose of this qualitative multiple case study was to explore the business risk management strategies independently owned auto maintenance businesses use, to mitigate natural disaster. The target population was independently owned auto maintenance business owners located in Texas and surrounding states who have continued to do business following a natural disaster. As a researcher, I was the primary instrument of data collection, data management, data analysis, and I observed strict adherence to ethical guidelines. Recommendations, findings, and strategies derived from the analysis of this study were presented.

Section 2 includes details about the research project, purpose of the study, role of the researcher, participants, the rationale for research method and design, population and sampling, and measure to ensure ethical research. In Section 2, specifics related to data

collection, including data collection instruments, data collection techniques, data organization techniques, and data analysis were presented. Also discussed is the reliability, and validity, described my plan to ensure the study would meet quality standards, and presented a transition and summary for Section 2.

Section 3 of the research includes an overview of the study. The discussions in Section 3 includes a presentation of the findings, applications to professional practice, and implications for social change. Recommendations for further study, reflections learned during the doctoral study journey, and the conclusion also were presented.

## Section 2: The Project

The purpose of this qualitative multiple case study was to explore the business risk management strategies independently owned auto maintenance businesses use to mitigate natural disaster. The participants of this study were five independently owned auto maintenance business owners located in Texas and surrounding states who have continuously operated their businesses for at least 5 years. The participants had to have successfully implemented business risk management strategies for disaster management in their business. The findings of this study may lead to positive social change by providing small business owners with useful information from data analyzed or, more importantly, from the outcome and accrual of knowledge. Such knowledge may include how to plan and apply a disaster management plan to mitigate disaster. Independently owned auto maintenance small business owners may learn how to apply business continuity strategies to mitigate disaster impact and to help them recover and continue operation and retain profitability and competitive edge. Independently owned auto maintenance small business owners may learn how to develop resiliency in overcoming disasters, which may result in continued positive participation in state and local economies. The findings, new knowledge, and insights from this study may help small businesses develop better business practices and processes regarding business continuity and may help reduce the failure rates resulting from inadequate preparation in the event of natural disaster. New knowledge on how to plan and implement business continuity plans may benefit the business community in Texas.

### **Role of the Researcher**

A researcher's role in a qualitative study is to act as the primary instrument for data collection, which involves gathering, organizing, and presenting study findings (Merriam & Tisdell, 2015; Runfola et al., 2017). I conducted a qualitative multiple case study using an interview protocol (see Appendix A) as the primary research instrument in this study and gathered evidence from multiple sources, as indicated by Yin (2014). Having chosen the appropriate research design, I recruited study participants, conducted interviews, managed the interview process to gain participants' trust, and then analyzed data. This process also included performing document analysis, coding data, identifying patterns and themes, and drawing conclusions.

There are four types of triangulation: (a) theory triangulation, (b) investigator triangulation, (c) data triangulation, and (d) methodological triangulation (Haydn, 2019; Yin, 2014). Researchers conduct data triangulation by using semistructured interviews and document analysis, a practice that enhances the study's reliability and validity (Krichanchai & MacCarthy, 2017). To conduct this research, I used semistructured interviews, member checking, a research log, and document analysis including a review of company documents such as strategic plans and other human resources from the company under study to fulfill methodological triangulation.

Research bias that develops from preconceptions or personal bias can impact a research outcome (Yin, 2014) and is an uncontrolled research limitation (Sarmiento et al., 2015). Researchers may influence the data collection process during interviews by rejecting or adding information (Yin, 2014). I avoided bias by being objective and neutral

in the data collection process. Qualitative researchers apply the bracketing method to separate personal beliefs, individual experiences, and perceptions from the research data (Sorsa et al., 2015).

In qualitative research, researchers must clarify their role by disclosing or explaining relationship, values, biases, and any assumptions with the research topic or participants (Marshall & Rossman, 2016; McInnis-Bowers et al., 2017). *The Belmont Report* (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) is the main source of the standards and guidelines for protecting research participants and ethics. I abided by the ethical considerations and methods as per the compliance report and based on the university's guidelines and the ethical principles outlined in *The Belmont Report*.

I have the experience and knowledge of disaster operations, having worked with organizations and people who have experienced natural disaster and applied business continuity strategies to mitigate disaster impact. For over 10 years, a personal area of focus was disaster prevention and management, and in this study, I had no relationship prior to undertaking this study with any of the participants. As a chief executive officer and founder of a nongovernmental organization dealing with saving lives, I have participated in disaster rescue operations emanating from road accidents, building collapses, floods, and terrorist threats. A part of my effort has involved participating on the road safety committees of major cities and at the United Nations Environment Programme in Gigiri, Kenya. The Road Safety Network Organization's main objective is to create awareness on accident prevention and mitigation strategies for schools,

organizations, and the public to help save lives on the roads. Modern society has become increasingly dependent on the resilience of critical infrastructures, and resilient health systems can help save lives in the case of a disaster (Seppänen et al., 2018).

On August 7, 1998, a truck bomb exploded at the back-entry gate of the U.S. Embassy in the Central Business District in Nairobi, Kenya, killing 213 people and causing injuries to 5,000 (Odhiambo et al., 2002). The number of casualties was higher than the services for which Nairobi hospitals could provide (Odhiambo et al., 2002). I participated in the rescue and evacuation of the injured and the dead in this act of terrorism. Through my organization, many lives were saved, and I received commendation from the World Bank, U.S. Agency for International Development, the U.S. Embassy, and other governments and institutions whose nationals were involved in this disaster.

The knowledge from such experiences, which includes strategies in rapid response for emergencies, communication, coordination, prevention, mitigation, and business continuity planning, were valuable lessons learned. The desire to help save lives through prevention and recovery strategies is a calling, and this study would serve as an opportunity to achieve that goal. The findings, new knowledge, and insights attained may help small businesses develop better business practices and processes regarding business continuity and may help reduce the failure rates resulting from inadequate preparation in the face of catastrophic events.

Qualitative researchers use interview protocols to manage or mitigate inconsistencies during the interview process (Morton et al., 2013) by letting participants

know what the interview process involves (Ariza et al., 2014) on a step-by-step basis (Yin, 2014). I followed the interview protocol (see Appendix A), which aligned with the interview questions (see Appendix B) and obtained Institutional Review Board (IRB) approval and local permission to commence data collection for the research study. The open-ended questions formed part of the interview protocol and helped to ensure consistency across participants and to understand the participants' points on the phenomenon under study (Doody & Doody, 2015).

### **Participants**

The participant selection criteria for research called for effective and fair sampling that matched given factors in a qualitative study. Choosing the right individuals to provide case study data to a researcher holds the key to research success (Yin, 2018). Determining sample size is contextual and partially dependent upon the approach under which an investigation is taking place (Boddy, 2016) and is not about the number of participants but the expressed opinions on a topic (O'Reilly & Parker, 2013). A qualitative study oriented toward positivism requires larger samples than in-depth qualitative research to gain a representative picture of an entire population under review (Boddy, 2016). I chose a qualitative multiple case study to acquire an in-depth understanding and explore how independently owned auto maintenance businesses use strategies to mitigate the impact of natural disaster in Texas and the surrounding states.

Researchers use a purposive sampling approach to recruit participants with the right knowledge, experience, and insight to answer the research question (Lewis, 2017; Palinkas et al., 2015). Purposive sampling should be based on the participants' ability to

provide relevant, accurate, and detailed information on the phenomenon or subject of the study (Hennink et al., 2015; Stein et al., 2016). I used purposeful sampling to select five auto business owners for this study. Purposive sampling can help save time and costs on resources, access to information, and expertise and is useful in the process of conducting a synthesis of qualitative evidence (Benoot et al., 2016).

The participant eligibility criteria entailed selecting five independently owned auto maintenance small business owners not employing more than 100 employees who were located in Texas and surrounding states and who had continuously operated their businesses for at least 5 years. Participants were required to have successfully implemented business disaster mitigation strategies in the auto maintenance service industry and survived a natural disaster. In consideration of the foregoing, eligibility was ensured and implemented in participant selection using appropriate screening criteria. The targeted participants were those who had established and maintained business continuity after a disaster and had the knowledge and capacity related to disaster preparation, survival, stabilization, and recovery in the independently owned auto maintenance service industry.

Researchers can gain access to participants through networking or contacts. Establishing a good working relationship with the participants is key to a successful research undertaking (Yin, 2014). I used phone communication to access the five participants. Following their verbal acceptance over the phone or via email confirmation, I emailed an official invitation welcoming them to participate in the study. I gave a consent form containing the voluntary nature of the study, the confidential protection of

the participants, and the extent of risks and benefits of the study to the consenting participant. Researchers share their expertise and knowledge on the topic of research but also bond through improved relationship with the participants (Holloway & Wheeler, 2013). Researchers can validate a study's eligibility criteria through periodic contacts between the researchers and the participants (McCrae et al., 2015). In this study, regular contact with the participants over the phone and zoom for member checking to help validate the study was part of the process to undertake this study.

## **Research Method and Design**

### **Research Method**

Quantitative, qualitative, and mixed methods are the three main types of research methods available for conducting research (Makrakis & Kostoulas-Makrakis, 2016; Maxwell, 2016), and the appropriate research method for this study was qualitative. Qualitative research involves gaining a comprehensive understanding of the key concepts, perceptions, and experiences related to a phenomenon studied subjectively (Inman et al., 2018). Researchers of qualitative research studies focus on events in natural settings to gain an in-depth understanding of and access to contextual meanings (Fletcher, 2017; Saunders et al., 2015), observe behavior and attitudes, and collect data close to the phenomenon (Marshall & Rossman, 2016). Researchers apply qualitative inquiry to study a population and to explore, identify, and explain variables that are difficult to describe (Bevan, 2014; Singh, 2014). Using qualitative research in this study was appropriate to explore and gain an in-depth understanding of what business risk management strategies

independently owned auto maintenance businesses use to mitigate the impact of natural disaster.

Quantitative research involves examining a business problem using numerical data, often by comparing groups or examining relationships between variables (Green & Salkind, 2017). Researchers use the quantitative research method to acquire generalized knowledge and make statistical inferences to a broad population (McCusker & Gunaydin, 2015; Saunders et al., 2015). The quantitative method was not appropriate for this study because the study did not include numerical data, comparing groups, or examining relationships between variables. Rather, I explored what business continuity strategies the independently owned auto maintenance businesses owners used to mitigate the impact of natural disaster.

A mixed methods study includes a combination of qualitative and quantitative research methods (Thurman, 2018) that researchers use to develop a deeper theoretical understanding (Saunders et al., 2015). This type of study is a combination of statistical data and thematic data extracted from participants' interviews (Hewlett & Brown, 2018) but in most cases can be time consuming (Hayes et al., 2013). A mixed methods approach was not suitable for this study, because this study did not include a combination of qualitative and quantitative data. The purpose of this study was to explore what business risk management strategies independently owned auto maintenance businesses use, to mitigate the impact of natural disaster, and the qualitative method was the most appropriate research method for this study.

## **Research Design**

I reviewed and considered four qualitative designs for the study, namely phenomenological, narrative, ethnography, and case study. A case study design was the choice as it is the most appropriate to investigate the phenomenon in depth and within its real-world context using multiple data sources such as observations, documents, artifacts, and interviews (Yin, 2018). Case study research often involves an attempt to expound how, why, and who made and implemented decisions and with what results (Schramm, 1971).

Researchers use ethnography to gain insight into understanding their research participants by sharing their beliefs or life experiences with them (Bamkin et al., 2016; Saunders et al., 2015; Wijngaarden, 2017; Yin, 2018), which requires lengthy field observations, time, and money, resulting in a large investment (Yin, 2018). Ethnography was neither suitable nor relevant for this study because conducting a protracted field work on this study is not the objective of this research. Researchers use narrative design in a case study to explore the personal accounts of individual participants to interpret an event or sequence of events and how these may connect to a phenomenon (Barbour et al., 2016; Saunders et al., 2015; Singh et al., 2015), which was not the intent for this study.

A phenomenological design is a positive way to explore the lived experiences of individual small business owners to understand a problem (Maxfield & Russell, 2017), and researchers use the design to explore and describe a phenomenon within a contemporary context (Marshall & Rossman, 2016). Achieving data triangulation based on small business owner explanations of their lived experiences was useful for enhancing

the reliability and quality of this research study. The phenomenological design data collected is primarily focused and reliant of first-person perspective, which precludes use of other data sources for methodological triangulation (Van de Pol & Derksen, 2018), and was therefore not suitable for this study.

I chose a qualitative multiple case study for this study to elucidate successful business continuity strategies and insights independently owned auto maintenance small business owners use to mitigate natural disaster impact. The knowledge from this study additionally may help contribute to raising awareness for small business owners to participate in business continuity programs through public–private partnership and collaboration within their communities. Such awareness may improve the rate of small business owners’ participation in general disaster preparedness strategies.

In qualitative research, validity is the interactive process between a researcher, participants, and the collected data that aims to achieve a higher level of accuracy and consensus through a common set of techniques such as triangulation (Tuval-Mashiach, 2017). Data saturation in the data collection process supports validity and refers to the point at which the data collected no longer generates any new themes or new information (Fusch & Ness, 2015). As data saturation is an integral part of ensuring rigor in a qualitative study (Gaya & Smith, 2016), all study interviews were conducted to a point where no new information appeared to emerge.

### **Population and Sampling**

Purposive sampling is a researcher’s choice based on researcher’s situated knowledge of the field and rapport with targeted participants (Barratt et al., 2015) and

enables researchers to create rich descriptions of a phenomenon, is less costly, and saves time (Palinkas et al., 2015; Siew Khoon Khoo & Saleh, 2017). Researchers use purposive sampling to identify the right candidates who have experienced a phenomenon or have successfully implemented strategies relevant to a phenomenon (Etikan et al., 2016; Lewis, 2017). I chose purposive sampling as the approach for selecting candidates who could provide answers to the research question regarding preventing and mitigating the effects of business disruptions in the automobile service industry. The sample for this study was five auto maintenance business owners in the auto maintenance industry in Texas and surrounding states.

Sample size determination in qualitative research is contextual and partly dependent on the phenomenon under study (Boddy, 2016; van Rijnsoever, 2017). There is no conventional guidance to determine the enough sample size for interviews to be conducted (Hesso et al., 2019), the number of participants for a qualitative case study can be as few as a one (Boddy, 2016). Methodical triangulation is a technique researcher use to achieve data saturation and enhancing the ability to replicate the case study with the standards remaining the same regardless of the number of participants (Fusch & Ness, 2015). Five independently owned auto maintenance service business owners located in Texas and the surrounding states, who have continuously operated businesses for at least 5 years were interviewed. The participants were required to have successfully implemented strategies for mitigating the effects of business disruptions in the automobile industry. While there are no rules for sample size in qualitative inquiry

(Patton, 1990; van Rijnsoever, 2017), it is important that data saturation is ensured and achieved in a qualitative study.

Data saturation is a significant issue in qualitative case study design and is unique in that the population and the sample are the same as the researcher gathers data on everyone in the sample (Fusch & Ness, 2015). In qualitative research, a good sample may help the researcher achieve data saturation when no new information is produced (Tran et al., 2016). Saturation is a strategy researcher use to ensure the trustworthiness of qualitative findings (Gaya & Smith, 2016; Hadi & José Closs, 2016; Morse, 2015). Participants were interviewed to a point where there were no new data, no new themes, and no added information presented, and served to signify the achievement of data saturation.

Researchers require specific eligibility criteria for individuals to meet to participate in a study (Long et al., 2018). The purposeful sampling approach is not meant to be comprehensive in terms of screening all potentially relevant participants, because the interest of qualitative researchers is not in seeking a single correct answer, but in examining the complexity of a different conceptualization (Benoot et al., 2016). Researchers use purposeful sampling to help identify rich, in-depth information regarding a research inquiry (Young & Blitvitch, 2018). Researchers using purposeful sampling select participants who possess the requisite knowledge and expertise to answer the research question based on the study requirements (Lewis, 2017; Stein et al., 2016; van Rijnsoever, 2017). Independently owned auto maintenance business owners who meet the eligibility requirement for study participants criteria were selected. The eligibility criteria

for participation in the study was (a) independently owned auto maintenance small business owners not employing more than 100 employees, (b) located in Texas and surrounding states, (c) have continuously operated their businesses for at least 5 years, (d) successfully implemented strategies for mitigating the effects of business disruptions in the automobile maintenance industry, and (e) survived a natural or unnatural disaster.

Fusch and Ness (2015) noted that selecting a quiet interview site free from distractions is desirable in a qualitative study. Access, convenience, and comfort level may influence interviewee responses during the interview process (Marshall & Rossman, 2016). A favorable site for carrying out a face-to-face interview in a comfortable location was selected. The interviews were carried out in a quiet location to aid in a successful execution of the recording process. During the interview through teleconferencing, cell phones were on silent mode to avoid disruptions during the interview process.

### **Ethical Research**

Researchers must show how they are complying with a given set of research protocols and articulate the ethical issues involved in their research (Sobottka, 2016). Respecting human subjects' rights and protection is the essential principle of research ethics (Nebeker et al., 2015) and involves mitigating various potential harms, generalizing benefits, and negotiating to determine what counts as efficacious and fair research (Bromley et al., 2015; Nebeker et al., 2015; Sobottka, 2016). Potential participants were provided with the relevant information pertaining their role and succinct research details prior to selection.

Authors of *The Belmont Report* defined respect for persons as enacted in the open communication of information relevant to study participation, including risks and benefits and ensuring voluntary enrollment in the research (Bromley et al., 2015; Zhang et al., 2019). Researchers must protect participants from harm, undue influence, and coercion (Alahmad et al., 2015; Nebeker et al., 2015; Zhang et al., 2019). Satisfying these ethical requirements was achieved by incorporating the principles and measures to ensure informed consent, participant anonymity, confidentiality rights, and options to withdraw from the study in the following subsections.

### **Informed Consent**

Obtaining signed voluntary informed consent forms in research can help develop positive relationships with participants enabling better in-depth response and cooperation during research interview (Alahmad et al., 2015; Kumar & Mahapatro, 2018). Telephone contact was made with the target participants and asked for verbal and email acceptance if willing to participate in the study. The informed consent forms were then sent to each potential participant via email as an attachment. Prior to commencing the interview with a participant, affirmation of acceptance, willingness, and consent of the participant to freely participate in this study was conveyed to the participant. The importance of right to ask questions by the participant was emphasized, the length of the interview process, and the importance of the participants role in this study. Walden University's IRB approval number is 04-27-20-0629840.

### ***Pseudonyms***

Researchers ensure participant confidentiality using pseudonyms for the respondents and their institutions (Derahman, 2017; Duarte, 2017; Gaus, 2017; Me, 2017). Pseudonyms of Participants P1 to P5 were used for the individual allocation of data collected, which include audio recordings, the informed consent forms, transcribed interviews, and data analysis results. After reviewing the contents of the informed consent form, the prospective potential participants had the opportunity to voluntarily agree to participate in this study or decline. Signed consent forms have been kept in secure custody and a participant was provided a copy when requested.

### ***Confidentiality***

Participants are concerned with confidentiality and privacy in research studies (Howarth et al., 2017). The safety of research data from participants is paramount in a research process, and data safety calls for a secure storage process and location (Mathu, 2017; Me, 2017; Zhang et al., 2019). To ensure confidentiality, data obtained should be secured using a private password-protected laptop and in encrypted cloud storage facilities offered by third parties (see Gaus, 2017). Amazon offers cloud storage facilities that have certain advantages over traditional ones from its competitors such as IBM and Oracle. The Amazon services advantage includes availability, scalability, off-site storage, on demand, and multiple tenancy through its S3 services (Han, 2015). Dropbox is a company that uses Amazon's S3 services, which claims that it aims for 99.99999999% durability and 99.99% availability in a year (Han, 2015). Dropbox is being used for the digital preservation of data to secure the data files in an online data storage system by

creating password and user identification. A third party was engaged to transcribe the information without identifying the voices on the audio recordings. The themes extracted from each participant were then coded. The data will remain in personal possession for safe custody and have been uploaded into Dropbox for a period of 5 years to safeguard the confidentiality, privacy, and rights of the participants.

### ***Option to Withdraw***

Ethical principles based on compliance requirements for research and the consent form clearly stipulated that participation is voluntary. The participants were free to withdraw any or all their contribution at any point during the research process, up until the time I analyzed the data to extract themes (see Madikizela-Madiya, 2017; Me, 2017; Nguyen, 2015). Communicating the participants right to invoke their right to withdraw from the participation at any time without fear or negative consequences is important (Muleya, Fourie, & Schlebusch, 2017). Data obtained from participants who withdrew from the study were to be destroyed and not included in the data analysis. No participants however withdrew from this study.

### ***Study Incentives***

Participation incentives may serve as undue inducements as may entrap people to participate in studies unwillingly (Hoffart & Scheibehenne, 2019). Sikweyiya and Jewkes (2013) noted that incentives can influence the research outcome. However, because of COVID-19, and the difficulty of getting accessing participants, this study participants were offered \$ 20 gift cards to participants after the interviews.

## Data Collection Instruments

Triangulation is the basis of data collection in qualitative research, where researchers often combine interviews, document review, and observations (Krichanchai & MacCarthy, 2017; Ridder, 2017; Yin, 2014) also provide a conclusion and interpretation of the research outcome (Varpio et al., 2017). In qualitative research, interviews are the most widely used data collection method (Hughes & McDonagh, 2017). The researchers collect data through an interview process that involves interacting with individual participants who respond to semistructured open-ended questions (Myers, 2015).

Hatton et al. (2016) used semistructured interviews with senior representatives of five organizations severely impacted by the 2010–2011 Canterbury earthquakes disaster to determine the effectiveness of business continuity plans. Likewise, Ali et al. (2018) found that semistructured interviews were the most appropriate approach to understand how divergent risks and resources connect to build resilience. Lama and Becker (2019) also noted using semistructured interviews enables participants to provide rich and extensive answers to the research question. As a principal data collection instrument in this qualitative study, I used semistructured interviews with open-ended questions to obtain in-depth answers to understand the business risk management strategies independently owned auto maintenance businesses use to mitigate natural disaster.

Researchers are the primary instruments for data collection in qualitative research and must avoid bias when collecting data (Marshall & Rossman, 2016). I was the principal data collection instrument in this study, and the primary data source were five

independently owned auto maintenance small business owners. Case study research calls for multiple data collection methods, and this requires multiple data collection sources (Yin, 2014), which can be synergistic, help improve data accuracy, and limit the researcher's biases (Miles & Huberman, 1994). I audio recorded participants' responses to the semistructured open-ended questions, and company documents were another source of data. Marshall and Rossman (2016) posited researchers should allocate time to review documents relevant to a research study. Yin (2018) emphasized the importance of company archival data or any available documentary information pertaining to each case study.

Supplementary data for the study primary data, the review also included documents on company operation policy and procedures for managing and mitigating disruptions, communication plans, business continuity plans, implementation schedules, tests, and risk management plans. An interview protocol is a process guide that contains a list of questions a researcher explores during the interview. A protocol consists of an overview of the research study, data collection procedures, and interview questions (Yin, 2014). The interview protocol helped to ensure consistency throughout the interview process that helped capture the business owners' responses elucidating the disaster survival experience and factors (see Appendix B).

I adhered to the interview protocol to conduct the interview using the semistructured questions, which served to collect rich qualitative data from participants. During this process, I listened carefully and looked out for any verbal cues and probed participants further to elicit a detailed and in-depth understanding of participants'

responses. Yin (2014) recommended observing body language to help understand attitudes, insights, or meanings.

Qualitative researchers often use member checking to ascertain the accuracy of the data collected (Marshall & Rossman, 2016; Reilly, 2013; Yin, 2014). Researchers conduct member checking after an interview. After recording participants' responses or answers, researchers share the data with the participants to verify the accuracy and to confirm that captured themes portray the participants' intended description of events (Marshall & Rossman, 2016; Patton, 2015; Strauss & Corbin, 2015). The member-checking process enhances the reliability and validity of the data collection instrument. I evaluated the results of the interview and added any feedback from participants after member checking to ensure validity and credibility.

### **Data Collection Technique**

Researchers may use purposive sampling to identify the ideal candidates who have experienced a phenomenon (Etikan et al., 2016; Lewis, 2017). I used purposive sampling to select participants who had experienced disasters and successfully implemented business continuity strategies to mitigate natural disaster impact in the independently owned auto maintenance industry. The sampled individuals provided answers to the research question based on the semistructured interviews. The individuals interviewed on this study were five independently owned auto maintenance business owners located in Texas and surrounding states. The research question for this study was: What strategies do independently owned auto maintenance small businesses owners use to mitigate natural disaster?

Researchers use several types of data collection methods in qualitative research (Abdalla et al., 2018; Yin, 2014). Researchers also frequently use a semistructured interview method to explore the perceptions and experiences of, and to help understand and establish the meaning of, a phenomenon (Brooks & Normore, 2015; Fusch & Ness, 2015). Semistructured interviews and document analysis to collect data by conducting face-to-face interviews and abiding with the interview protocol (see Appendix B). Semistructured interview process weaknesses may include researcher interpretation bias, bias due to wrongly presented questions, and interviewee memory lapse (De Massis & Kotlar, 2014). At the start of the semistructured interview process and to conform to the ethics protocol in place for this study, participants were informed that they were not needed to answer any question they were uncomfortable with as suggested by Samkin et al. (2014). Additionally, I had the opportunity to rephrase the questions where needed so participants could better understand these and respond appropriately. Yin (2014) posited that, in semistructured interviews, researchers provide direction and structure for the dialogue to precipitate a vibrant discourse. In addition, to limit bias, researchers should avoid asking leading questions during the interview (Yin, 2014). I avoided using leading question during the interview process.

Researchers begin the interview process by asking for participants' consent and willingness to proceed with the interview (Alahmad et al., 2015; Kumar & Mahapatro, 2018) to ensure they understand the research perspective as laid out in the research protocol. Additionally, researchers prepare for the possibility of participants feeling distressed; one way of handling emotional participants is to make them feel safe, to be

aware of participants' emotions (Rodriguez, 2018), and to have a box of tissues available. There was no need of having a box of tissue available as I conducted teleconference interviews and not face-to-face interview. The use of audio recording in the interview to capture responses was communicated to the participants and consented in advance by way of email before starting the interview process. The six open-ended semistructured questions as laid out in the interview protocol (see Appendix B), were the foundation of the interviews. The open-ended interview questions format allowed flexibility in asking follow-up and probing questions to reach an in-depth understanding and to explore specific strategies that could help auto maintenance small business owners mitigate disasters. The interview process should continue to the point of data saturation, when no more new themes or information emerge (Doody & Doody, 2015; Fusch & Ness, 2015; Hagarman & Wutich, 2017), which serves as evidence that qualitative researchers have enough data to address the research question in adequate depth (Constantinou et al., 2017).

Qualitative research is an interpretative method in which researchers aim to explore, understand, and explain people's experiences using nonnumerical data extracted during the interview process (Denzin & Lincoln, 2011). The advantage is that it leads to the extraction of rich, thick, or deep information that readers can understand (Patton, 2015). The disadvantage is that data produced following an interview are usually in the form of text that reports what the interviewees said or did, which the person who interviewed or observed the participants then analyzes, therefore leading to a likelihood of subjectivity and bias (Hadi & José Closs, 2016; Marshall & Rossman, 2016).

### **Audio-Recording Device**

Audio recording is an effective way of preserving an interactive experience through an interview process and enhancing the quality of a study (Walker & Halvey, 2017). Audio recording the interview enables capture of the necessary data. Participants' data safety is important (Motaung et al., 2017). In this study, participants were informed of the audio recording during the interview and told that their data will be secured and kept safe by creating a backup copy. Participants were emailed a consent or acceptance to be interviewed prior to commencing the interview and consent to record the interview was received before the recording commenced. At the end of the interview, the participant was notified when the recording device was stopped.

Researchers transcribe data from interviews to enhance the confidentiality and anonymity of the participants (Nath, 2000). At the end of recording, audio-recorded data from the device was downloaded and saved securely on my laptop and the third-party cloud vendor using a password. A third party was used to transcribe data and the qualitative data analytical software NVivo 12 used for data analysis. Within 48 hours of submitting the recordings, I transcribed the recorded interviews, printed the documents after close verification prior to the member-checking process. Capturing, ensuring the safety of, and backing up participants' explanations and interview responses is an effective way of preserving data, and transcribing interviews verbatim reduces the possibility of missing some important points of participants' responses (Motaung et al., 2017). A drawback of audio recording interviews includes possible loss of signal if a cell phone is being used for recording; therefore, researchers should consider conducting

interviews in an office-type environment with a strong signal (Seitz, 2015). I verified with participants that interview locations had strong signals and connectivity for their phones.

### **Document Analysis**

Researchers apply document analysis to understand and review the historical meaning and perspective of a phenomenon (Yin, 2012). I reviewed and analyzed predisaster plans and the existing plans and guidelines to evaluate the state of preparedness. Researchers can use multiple sources of information from different angles to confirm, develop, or illuminate a research problem (Abdalla et al., 2018). Researchers apply data triangulation to enhance the quality and rigor of a study through the application of multiple data sources (Abdalla et al., 2018; Denzin & Lincoln, 2011; Marshall & Rossman, 2016). Documents related to disaster mitigation strategies such as insurance binders or vendor management guidelines help researchers to understand business risk strategies approach (Travelers Insurance, 2020). Business owners who choose strategic vendors are more likely to withstand a disaster, as was the case when the Walgreens business continuity team responded efficiently working with partners and vendors to ensure business continuity plans were activated in the 2017 hurricane season (Business Continuity Institute, 2018c). Business impact analysis reports, disaster response guidelines, and the crisis management planning documents are sources of information to understand how a business identifies significant threats to normal operations (Business Continuity Institute, 2018c; Travelers Insurance, 2020). Using more than one source as a strategy limits personal and methodological biases and increases the

possibility of reproducing the findings (Abdalla et al., 2018). Triangulation means being able to look at the same phenomenon or research topic through more than one source of data. During the interview, I asked the participants to share the planning, designing and the implementation process for disaster mitigation strategies and reviewed with the secondary data from the public domain such as the Business Continuity Institute website. The documents were vital for the data analysis and helped raise follow-up questions that shed more insight into and a better understanding of the phenomenon of risk.

After obtaining Walden University IRB approval, an introductory letter to possible qualified participants outlining the study objective and intent, benefits of the study, selection criteria, and a copy of the consent form, was sent out. The next step was to schedule a Zoom or phone conference meeting with the participants for the interview. An audio-recorder was used to record the interviews, and a personal Android phone served as a backup strategy and helped with note taking. The interview session lasted between 30 to 45 minutes. In qualitative studies, researchers must pledge to keep their data well organized and safe and must develop a plan indicating how they foresee doing this and ensuring they adhere to their plan (Farooq & de Villiers, 2017; Motaung et al., 2017). Researchers organize data collected in a study by maintaining accurate records of the findings based on the steps of the procedure undertaken (Farooq & de Villiers, 2017; Yin, 2014). Taking notes augments the audio recording and, after completing an interview, researchers should reread their interview notes, reflect on the interview to evaluate both the questions asked and the quality of the conversation, and allocate

sufficient time for transcription and analysis (Farooq & de Villiers, 2017). I took notes and reviewed them after the teleconference interview ended.

### **Member Checking**

Ensuring integrity, quality, and reliability is important when collecting data through qualitative research methods, as reliability is synonymous with consistency (Gaya & Smith, 2016). Yin (2014) noted that researchers need to establish reliability and validity by preparing for their study with the skills and values of investigators, training for the specific case study, developing the protocol for the study, screening candidates, and conducting a pilot case study that will help increase the reliability of the study (Yin, 2014). I followed the interview protocol guidelines and practiced reciting the interview questions to familiarize myself with the questions. Jordan (2018) noted reliability and validity are critical elements of a decent quality research study, and researchers must strive to ensure research studies are valid and reliable.

Member checking, also known as participant or respondent validation, is a technique for exploring the credibility of research results. In this process, participants were offered the opportunity to offer clarification on the verbatim capture of their expressions and a review of the accuracy of data interpretation for accuracy and resonance with their experiences. The process may include validating the emerging themes to represent the participants' narration of events (Choi & Roulston, 2015; Hadi & José Closs, 2016), to represent participants' voices and feedback (Choi & Roulston, 2015). All participants had the opportunity to member check after the interviews. Ensuring rigor in qualitative research involves affirming the trustworthiness, credibility,

and plausibility of research, as viewed from the use of theory, research design, data generation, and data analysis (Anderson, 2017). In qualitative research, rigor is not necessarily good unless the researcher includes additional criteria relating to professional ethical practice as the basis for the value of the research (Walby & Luscombe, 2016). Researchers create credibility by uncovering rich, in-depth, and thick descriptions during the interview and share the approach used to gain participants' insights (Harvey, 2015).

### **Data Organization Technique**

Some qualitative researchers use traditional file folders and digital databases as strategies to document, organize, and store data in case studies (Marshall & Rossman, 2016; Yin, 2014). The data for this study were transcriptions of the interviews with the five auto maintenance owners, observations have been stored as transcribed notes, documents, note cards, a reflections diary, and electronic recordings stored in small, marked containers. Research logs are vital for noting and tracking evidence to support data analysis, and researchers write down any issues or problems encountered during the data analysis process (Williams, 2015). A research log helped keep track of the data analysis process. Researchers use technology for the convenient organization, storage, security of data, and access (Garcia & Gluesing, 2013; Moylan et al., 2015)

Methodological data triangulation involves using data collected from multiple sources to improve the quality of the study (Miles et al., 2014). Researchers use methodological data triangulation to reinforce the rigor and quality of a study when applying multiple data sources (Denzin & Lincoln, 2011; Marshall & Rossman, 2016).

Each participant was given a unique file identifier designated by an alphanumeric code, such as P1, P2, et cetera, for grouping data chronologically for ease of reference. An audio recorder was used to capture data while an Android phone served as backup for recording. Data captured were then transferred and saved securely. Documents and notes having been scanned into digital formats, NVivo, a computer-assisted qualitative data analysis software was used to analyze the data. I used a scanner to save electronic copies of documents and handwritten interview response notes. After transcribing the interview recordings into Microsoft Word documents, the features of NVivo were found useful to review, organize, and analyze data. The electronic data files were then saved on a password-protected computer and kept back-up copies locked in safe and dropbox. As required by Walden IRB, all data (both electronic and paper formats) will be kept locked securely for 5 years.

### **Data Analysis**

Data analysis in a qualitative study involves collecting and systematically reviewing data to extract meaningful information from the participants relating to the study topic (Carter et al., 2014). Researchers analyze textual data for patterns, themes, and meanings of the phenomenon under study (Bryman, 2015) by categorizing, sorting, and extracting themes (Chowdhury, 2015; Yin, 2018). Among the existing types of data analysis strategies, scholars prefer triangulation for case study research (Cronin, 2014; Yin, 2018). Researchers use multiple sources of data such as interviews, observations, questionnaires, and documents to analyze a phenomenon under study (Yin, 2014). In addition, researchers use triangulation strategies to enhance data collection methods such

as interviews, questionnaires, observations to explore a deep understanding of the research topic (Carter et al., 2014; Nassauer & Legewie, 2019).

The four types of triangulation available for a researcher in a case study are investigator triangulation, data triangulation, theory triangulation, and methodical triangulation (Patton, 2015; Yin, 2014). Data from participants were collected using interviews and company documents and reviewed with a focus on data triangulation. Investigator triangulation refers to investigators who work together to perform analysis (Archibald, 2016), and theory triangulation is the analysis of a single set of data by applying different theories and perspectives (Patton, 2015). Neither investigator triangulation nor theory triangulation were appropriate for this study. Patton (2015) noted methodical triangulation is the process of analyzing data extracted using different methods to improve the consistency of research findings. Using methodical triangulation aided in achieving holistic analysis and Holling's (1973) organizational resilience theory served as a suitable lens to underpin the study. I collected and analyzed data from participants using semistructured interviews and company documents to explore the strategies independently owned auto maintenance businesses use, to mitigate natural disaster.

The data analysis process begins the moment the recording of the participants starts and then proceeds to be transcribed, evaluated, categorized, and then coded as themes based on research questions (Chowdhury, 2015; Yin, 2018). Using semistructured interview questions, I obtained the relevant data for this study from the participants and then used Yin's five-step qualitative data analysis plan that consists of (a) compiling data,

(b) disassembling the collected data, (c) reassembling the collected data, (d) interpreting data, and (e) analyzing conclusion. The organization resilience theory was used to understand, interpret, and explore patterns the business risk management strategies independently owned auto maintenance businesses use to mitigate natural disaster.

Data compilation is the process of bringing data together and arranging it into an easily accessible database. Significant concepts or themes were captured and then saved in a single file, and transcriptions of the recorded interviews were then placed in a Microsoft Word document. Bryman (2015) and O'Connell (2013) suggested that files be imported into NVivo 12<sup>th</sup> software version for data classification, management, and back up. Specifically, I used the coded identification of participants (Participant 1, Participant 2) for the anonymous representation of the participants without any personal information to avoid exposure of personal information in the final report. Apart from using NVivo 12 software version to code the transcribed data, I sorted the transcription manually to help gain a deeper understanding of the material and a closer familiarity with the transcribed data. Marshall and Rossman (2016) suggested manual transcription provide researchers the opportunity to reflect on, explore, and reexplore the data to attain a better understanding with richer contextual information.

Disassembling data collected takes place when coding and deconstructing data begins (Yin, 2014) in a process of categorizing data related to each other into groups (Zamawe, 2015). Marshall and Rossman (2016) suggested using codes to identify themes or concepts within the collected data. Shaw and Satalkar (2018) suggested data analysis is the transcribing and coding of data using software to arrange themes by using deductive

analysis. After data collection was complete, coding took place as the key data analysis process to help identify key themes and patterns to answer the research question. In addition, keywords embedded in the interview transcripts were searched and extracted using Microsoft Word. The search process helped with the identification of codes and concepts relevant to the formation of themes and were compared with those generated by NVivo. Zamawe (2015) noted that the human query element in the analysis is also important and should be compared with the NVivo findings. I continued to analyze the available data to extract similar and differing concepts discovered during the disassembly phase.

Reassembly, as defined by Yin (2014), is the follow-up process that includes the critical reflection and application of member checking to authenticate interpretations of data, yielding major themes. I used the NVivo 12 version to analyze the data, which involved a process of logging, grouping, and filtering data, made possible for the themes to emerge. Tracing themes involves evaluating previous themes and patterns to form themes that could help answer the research questions (Yazan, 2015). During this stage, researchers take the opportunity to reflect on the extracted themes from the data and make changes (Baškarada, 2014). Comparing the emerging themes from the interview to the document review and handwritten observation notes helped determine the point of data saturation (Fusch & Ness, 2015).

The interpretation phase involved explaining the findings extracted by compiling, disassembling, and reassembling the data sources used (Yin, 2014). Concepts that represented relevant themes emanating from the analysis to help answer the research

question were grouped together. The nuance of methodical triangulation (Natow, 2019; Patton, 2015; Yin, 2014) helped to corroborate the findings and revalidate the themes extracted from the document and interview reviews.

The final phase of this study led to the conclusion of the analysis. In qualitative research, researchers can deliver a clear demonstration of their findings in many ways (Yin, 2014). The basis of inquiry in this study was to discover what business risk management strategies independently owned auto maintenance businesses use to mitigate natural disaster. After the identification of themes, I correlated them with the literature review findings and conceptual framework and then used organizational resilience theory to guide in the interpretation and conclusion of this study. This study included rich and thick descriptions of participants' experiences with natural disasters and the strategies used to ensure the survival of their business.

### **Reliability and Validity**

The objective of using qualitative research as a methodical approach is to (a) obtain the highest quality results, (b) attain rigor, (c) apply a systematic process, (d) yield high-quality results, (e) provide replicable and generalizable work, and (f) generate evidence (Denzin 2017). Qualitative researchers must demonstrate rigor through the affirmation of credibility, trustworthiness, and plausibility of their research based on the conceptual framework, research design, data generation, and data analysis (Anderson, 2017). Researchers use methodological data triangulation to reinforce the rigor and quality of their study by applying multiple data sources (Denzin & Lincoln, 2011; Marshall & Rossman, 2016) and ensure quality by establishing the credibility of their

research findings. Reliability, validity, and transferability determine the quality of research and are the standard that scholars use to judge study results (Gaya & Smith, 2016; Noble & Smith, 2015; Yin, 2018).

### **Reliability**

Integrity, quality, and reliability are important when researchers collect data in a qualitative research study (Gaya & Smith, 2016), and reliability is synonymous with consistency and the dependability of the results (Gaya & Smith, 2016; Noble & Smith, 2015; Yin, 2018). Stable research results mean that another researcher can replicate the study and depicts reliability (Hatamleh et al., 2018). Ensuring reliability enables future researchers to replicate a design to address the same phenomenon and reach their conclusions by using the same procedures and research protocol with each participant. Reliability calls for complete, inclusive, accurate, and verifiable data in form and context (Noble & Smith, 2015), and by minimizing biases and errors, researchers use more than one source of data triangulation for accurate analysis and reliability (Da Silva et al., 2016; Singh, 2014; Yin, 2018). This study included a review of archival documents and other company documents, for example appraisal reports, strategic plans, disaster prevention guidelines, and other human resource documents from the companies under study to fulfill methodological triangulation. Reliability applies to the researcher as well as the study. A researcher can illustrate reliability by showing the replicability and objectivity of the data obtained including consistent results (Ma et al., 2015). Yin (2018) noted researchers use interview protocols, member checking, transcript review, and audit trails to increase reliability. To increase reliability in this study, I accurately reviewed and then

interpreted answers from participants for each question. Paraphrasing participants' responses to each question ensured that the intended response was accurate, increasing reliability. Finally, the interview protocol used helped with the research audit from beginning to end to ensure that all necessary steps were covered and to enhance reliability.

Dependability includes verification of the findings to establish the reliability of a research study using member checking to reaffirm transcript review and the data analysis outcome (Lub, 2015; Park & Park, 2016; Yin, 2014). Member checking requires repeated conversation or communication between a researcher and a participant to extract any information missed during the initial interview process (Harvey, 2015). The member checking process has the potential to (a) facilitate participants to add additional comments to the study findings, (b) help researchers and participants reverify the accuracy of findings, and (c) clarify and extract more information (Harvey, 2015). Using member checking to validate the research findings is one way of ensuring reliability and dependability (Noble & Smith, 2015). After conducting the interview and document review process in this study, which served to enhance reliability, Study participants were thus offered the opportunity to offer clarification on the verbatim transcriptions of thoughts and expressions in the interviews and given the opportunity to review the accuracy of the data collected and a voice in the interpretation of the data.

In qualitative studies, dependability aligns with the quantitative norms of reliability, and researchers address dependability to ensure the research findings are consistent and dependable (Yin, 2014). Creating an audit trail of the data collection

process, analysis, and decision process enhanced the dependability of the research study (Crowe, Inder & Porter, 2015). Joubert and Loggenberg (2017) suggested that data saturation enhances dependability, and that researchers should obtain a saturation point when there is no new information coming out of the answers received from participants. Data collection using semistructured interviews of the independently owned auto maintenance owners continued until there was no new information. Fusch and Ness (2015) noted that reaching data saturation enhances the dependability of a research study. In this study, semistructured interviews, archival documents, strategic plans, and other human resource documents were used to triangulate data and ensure reliability. Hammarberg et al. (2016) noted a need for a diligent research process that is easy for reviewers to understand and that clarifies how the researcher obtained results based on logic and methodology.

Facilitating and keeping a document audit trail or sequence enhances the reliability of a qualitative study (Crowe et al., 2015; Lub, 2015; Yin 2018). Keeping detailed, clear descriptions, making direct observations, and maintaining an audit trail ensures the reliability of a study (Smith & McElwee, 2015). Applying member checking, data triangulation, and maintaining an audit trail sequence enhanced reliability of the study. The documentation included the sequence of events during the data collection and analysis process up to the conclusion and personal reflections comments of this study. Such notes and comments included what went right and what could have been handled better.

**Validity**

Lincoln and Guba (1985) provided the following components of trustworthiness in a qualitative study: credibility, dependability, confirmability, and transferability. Scholars have continued to emphasize the importance of research reliability and validity, and internal and external validity is the foundation for confirming the integrity of research results (Yates & Leggett, 2016; Yin, 2018). Case study researchers can identify three types of validity: (a) construct validity, (b) internal validity, and (c) external validity (Yin, 2018). Ensuring validity in data collection affirms that the result of a research study represents the phenomenon that a researcher is claiming to measure. Yates and Leggett (2016) suggested validity is the confidence level by which the research findings accurately portray the results. Validity also refers to the suitability of the research tools deployed in the form of methods, design, data, and the complete process (Leung, 2015). Yin (2018) suggested a researcher explores validity of qualitative data by checking and rechecking the accuracy of the results. A researcher does this by looking at possible valid interpretation but also addresses alternative explanations. Validation of this research study by exploring possible valid interpretations and addressing alternative explanations and views was the key objective. Researchers acknowledge that validity is central to ensuring the authenticity and credibility of a study (Connelly, 2016; Fusch & Ness, 2015). After conducting initial interview, interpreting the participants' views based on sharing a word-for-word transcript with the participants to maximize reliability and validity, as suggested by Fusch and Ness (2015), was applied.

As a form of quality assurance, credibility is an essential ingredient of a research study that helps define a research process from design through data collection, final analysis, and the presentation of findings. Triangulation is one of the techniques used to confirm credibility in qualitative research. Abdalla et al. (2018) noted that triangulation is the observation of the same phenomenon or research topic through more than one source of data. Using multiple methods also helps researchers discover misleading dimensions in a phenomenon (Abdalla et al., 2018). Other techniques researchers use to confirm credibility and validity are member checking, reflective journaling, and prolonged engagement (Hammarberg et al., 2016; Smith & McGannon, 2017). Rich contextual descriptions serve as a truthful holistic presentation of the study (Hammarberg et al., 2016; Smith & McGannon, 2017). Contextually rich contextual data was collected using the following strategies: member checking, reflective journaling, triangulation, and prolonged engagement with the study participants. A part of this process was in presenting to participants, the analysis and interpretation of responses in the interviews. Scholars have noted that using data triangulation enhances data saturation (Fusch & Ness, 2015; Yates & Leggett, 2016). Data saturation was achieved using interviews and reviewing corporate documents and archival information included conducting an extensive data review. Fusch and Ness (2015) defined data saturation as a point when a researcher interviewing participants finds no new data, no new themes, no new information, and the possibility to replicate the study is thereby enhanced. Prolonged engagement with participants and an extensive review of all materials help to ensure data

saturation and credibility (Korstjens & Moser 2018). In this study, regular contact with the participants was maintained.

The transferability of qualitative research depends on reliability and consistency, which means that another researcher can replicate findings or results based on the same context and with the same data (Anney, 2014). Although a researcher can decide the transferability of study results to his or her situation (Bengtsson, 2016), case studies lack generalization of study results (Tsang, 2014). The application of generalization in quantitative research may not be possible with qualitative research because of the naturalistic and contextual nature of qualitative research (Hays et al., 2016; Lub, 2015). The following data collection methods from multiple sources of evidence to conduct methodological triangulation were used: interviews, company databases, journaling, reports, and analysis of physical artifacts such as SBA reports and government databases. Fusch and Ness (2015) suggested that performing triangulation from multiple sources can ensure the richness of data. In addition, and as suggested by Anney (2014), transferability in this study is hoped for and anticipated through purposeful sampling and applying thick contextual descriptions. Researchers may achieve transferability by providing detailed description of the research process and participants to help readers decide potential application and relevance to personal settings (Korstjens & Moser, 2018). Triangulation and transferability have the potential to illuminate research findings, allow the readers to understand the contextual nature of the study, and help them draw informed conclusions.

Confirmability is another component of validity and refers to the presentation of participants' views accurately without the influence of researcher bias (Hays et al., 2016).

Tavakol and Sandars (2014) suggested that the analysis of research findings should be representative of the respondents' viewpoints without any injection of researcher biases. Avoiding bias in data by researchers affirms research confirmability (Lyons et al., 2018). Methodological triangulation was followed to enhance confirmability by using multiple data sources such as interviews, company databases, journaling, and reports. In addition, member checking helped in confirming the accuracy of data interpretations. Researchers also apply reflexivity and bracketing for bias mitigation (Cypress, 2017). Recording daily activities from the start of data collection to completion was captured in a reflective journal to mitigate bias. Park and Park (2016) noted that qualitative research is unstructured and value laden but could be biased following the researcher's interaction with the participants. Kratz and Strasser (2015) suggested peer-reviewing data audits is an acceptable way to illustrate the type of confirmability that can eradicate doubts, enhance trust, and increase the value of qualitative research studies. The data analysis process of this study was member checked by participants to enhance confirmability.

Apart from peer review, researchers have identified methods that support confirmability, and member checking is one such method. Member checking calls for a researcher to have a continued dialogue with participants on establishing the accuracy of the interpretation of the interview data (Hays et al., 2016; Patton, 2015). Member checking with the participants was applied to ensure the accuracy of the documented meaning and interpretation of the interview data. The other methods of maintaining an audit trail to support confirmability are keeping research notes and keeping reflective journals. In addition to keeping research notes and reflective journals, the supported

rationale in the study design and methodology is explained in this study. The measures in this study also entailed addressing any biases or assumptions, and the research process also included providing a detailed audit trail supporting any decision made in relation to data collection and analysis.

### **Transition and Summary**

In Section 2, the purpose of the study was restated, and the discussion presented included a description of the personal role as the researcher, details on the study participants, the rationale for the choice of research methodology, and the data collection and analysis processes. I also reviewed the ethical dimensions of the study and the plans to ensure the validity and reliability of the research. In Section 3, the details presented include the findings of the study and the significance of the study, including possible implications for social change, recommendations for further study, and conclusions.

### Section 3: Application to Professional Practice and Implications for Change

#### **Introduction**

The purpose of this qualitative multicase study was to explore the business risk management strategies independently owned auto maintenance businesses use to mitigate natural disaster. In this section, I have presented four main themes that emerged from interviewing and examining of company documents of the five independently owned auto maintenance business owners who participated in this study. I noted that the business owners valued their employees and business financial strength and offered a greater emphasis on protecting employees, and they implemented prudent financial strategies as a cornerstone for mitigating a natural disaster. The findings from the in-depth interviews conducted, the review and analysis of the secondary data from the public domain credible website sources revealed the following four themes: (a) employee relations and financial strengths, (b) disaster planning and response guidelines, (c) communication, and (d) collaboration and partnership. Each theme aligned with the Holling (1973) organizational resilience theoretical framework that refers to the ability of a business or organization to put in place a strategic initiative that enables performance in any environment to withstand and recover from tragic events or difficult experiences.

#### **Presentation of the Findings**

The central research question in this study was:

RQ: What strategies do independently owned auto maintenance small business owners use to mitigate the impact of natural disaster?

To undertake this study, I conducted semistructured interviews with five independently owned small business owners in Texas, Arkansas, and Louisiana and used semistructured interviews and asked open ended questions that enabled the participants to clearly share experiences and expertise on the strategies used to mitigate natural disasters. Because of the COVID- 19 pandemic, it was not possible to conduct face-to-face interviews. The Centers for Disease Control and Prevention (2020) have offered guidelines on the Coronavirus pandemic, and social distancing was the key preventive guideline. Before commencing the interviews, each participant was given the opportunity to confirm that they had received the consent form via email and had agreed to be interviewed by responding to a study participation request. The teleconferencing interviews for this study lasted between 30 to 45 minutes. Participants also shared any available information regarding their organizational documents such as manuals and procedures on training, testing, exercising, financials, supply chain, and vendor management design and contents structure as explanation. Other documents discussed and explained over the teleconference included forms and wall charts, instruction diagrams designed for business disaster planning, business continuity plans, and incident action plan designs. Within 7 to 15 days of each interview, after summarizing the interview responses, I conducted member checking to enhance validity and the accuracy of the results. All the five participants confirmed the summaries to be a true representation of their responses and answers to the interview. I subsequently used NVivo 12 software to arrange, code, and analyze the data. The coding of participants data based on themes generated and captured by topics are shown in Table 1.

**Table 1***Themes Generated from Participant Interviews*

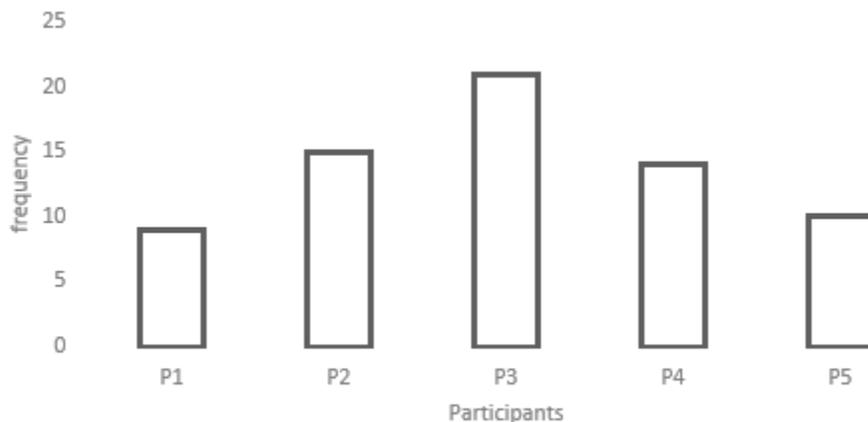
Themes	Frequency	% of frequency of
Employee relations and financial strength	69	32
Disaster planning & response guideline	56	27
Communication	50	24
Collaboration & partnership	36	17

*Note. n = frequency*

**Theme 1: Employees Relations and Financial Strength**

Employee relations and financial strength is a critical strategy used by the independently owned auto maintenance businesses to mitigate natural disasters and was among the first themes that emerged from the data collected. P1 noted that part of their strategy is acknowledging the importance of employees and the need of applying a humanity-based approach when dealing with employees before and after a disaster. P1 added that the best way to protect a business from disasters is to take care of employees, reaching out to them and even buying groceries and delivering them to their homes as was the case when the business was closed because of COVID-19 guidelines from the CDC. P2 also noted:

We always ensure that we take care of our employees and in the case of COVID-19, we had to ensure that our employees were safe, including their families. We ensured that we let them go home and stay safe including supporting them financially during the time the business was closed based on CDC guidelines.

**Figure 1.***Employee Relations and Financial Strength Themes Generated From Participants**Interviews*

P2 further noted that employees are important, and a business should always plan to save money for disaster use. Employees got paid even when not working 40 hours just to keep them motivated and to ensure that the business did not lose them after the pandemic, which can happen during disasters. P3 noted that keeping employees safe during disaster is particularly important. They observed the CDC guidelines by decorating their workspace with clear guideline requirements on safety not only limited to COVID-19 but also relating to other types of disasters such as hurricanes and tornadoes. P4 noted:

We enhance employee relation through effective communication via email, phones, and verbally with our employees to foster better relation by updating and informing them of any situation that can impact them such as this COVID-19

disaster and encourage them to stay safe by providing the necessary support and clear guidance.

P4 also stated:

Ensuring good relations with the lenders or bankers is preparing for a disaster because when we need funds to pay employees, you have to have a good banking relation with banks to help you much faster so you can help employees financially with their pay.

P5 added that financial strength is a good way of facing a disaster and that saving money for the rainy days does help as is the case of COVID-19, using his savings to keep the business running because did not get any financial support from the disaster management team.

All five participants emphasized the importance of being able to support employees financially and emotionally during disasters, and that requires business financial stability. In addition, all five also agreed that ensuring employee safety, job security, and retention during disasters is one way of enhancing employee relations and retention that can ensure a business has employees postdisaster to continue delivery of its services and improve business continuity and organizational resiliency. On the importance of employee security, P2 noted:

Employee security and safety has never been more important in a disaster situation such as this COVID-19 situation that we are not used with. It is not a tornado or hurricane or ice storm which we have experienced in the past that you can plan for—this is different. We therefore articulate government and other

agency emergency requirement like enforcing the use of mask, cleanliness, wipes and keeping the six feet distance between our employees and customers within our workspace.

P2 added, “When customers come into our working space without masks, we politely urge them to wear masks so that they are safe, and our employees are safe.”

All participants stated that without effective employee relations and financial strength, the employee retention rate postdisaster is affected with consequences on the business’s competitive advantage, even resulting in some businesses closing. The documents shared by participants such as emails, planning charts, execution, and communication strategies with employees during disasters showed the importance of employee relations and financial strength to the participants’ strategies.

The existing research in locating qualified employees supports and corresponds with findings in Theme 1 on the importance of employee relations and financial strength. Corey and Deitch (2011) suggested that locating qualified employees and experiencing related staffing issues was a major roadblock to small business recovery post-Katrina. Sydnor et al. (2017) further noted that locating employees and getting them back to work post-Katrina was the second strongest predictor of business recovery after loss of customers. Not only is the employee financial strength important for employee’s wellness and work productivity but is a way businesses or employers express care and concern for their employees (Despard et al., 2020; Frank-Miller et al., 2017).

For example, P1 explained why employee relations and financial strength is important as it enabled his business to keep employees on reduced hour wages for 6

months when a tornado hit their business in May 2011. P1 added that it would not have been possible if not for savings and financial strength to operate fully and recover after the 6 months of partial operation. P1 further explained that he applied the same strategy to get through February to May of 2020, during a COVID-19 peak, and he is on gradual successful recovery to full business operation.

Theme 1 included employee relations and financial strength and correlated with Holling's (1973) theory on organizational resiliency. Resilience in businesses is a strategic initiative that enables performance in any environment and refers to the ability to withstand and recover from tragic events or difficult experiences (Hatton et al., 2016), including how small business managers or owners react and bounce back after disasters (Bastan et al., 2018). Employees matter, and Hatton et al. (2016) suggested the importance of planning for possible societal and personal disruptions to workers following a disaster and its importance to resiliency and business continuity. Most businesses' disaster management plans focus on physical resources but not human resources, and such was the case with the Christchurch earthquake during a 15-month period of powerful seismic activity in 2010–2011 (Hatton et al., 2016). Holling's (1973) theory of organizational resiliency corresponds with Theme 1, where employee relations and financial strength is a critical strategy auto maintenance small business owner use to mitigate natural disaster by enhancing employee retention during and after disasters for business continuity.

## Theme 2: Disaster Planning and Response Guidelines

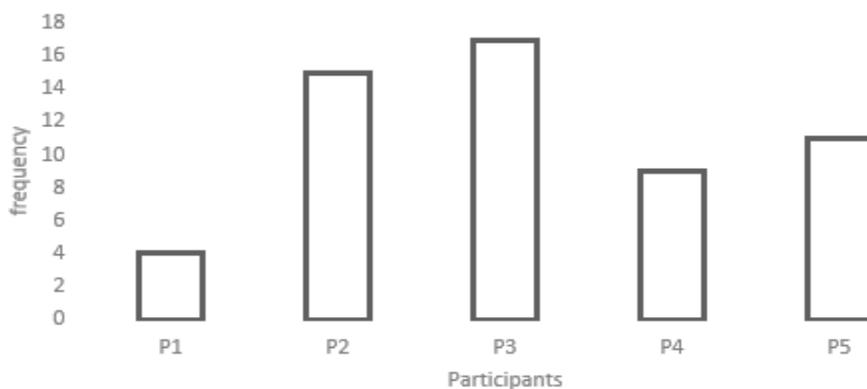
Disaster planning and response guidelines were the second themes that emerged from the data collected on the strategies auto maintenance small business owners use to mitigate natural disasters.

Disaster planning and response requires a cyclical Business continuity planning. Rigorous plan administration and maintenance, as well as any events experienced, will necessitate revision and/or plan additions (Business Continuity Institute, 2018b). Natural disasters pose unpredictable and significant threats to the continued profitable operations and continuity of small and large businesses, which have the potential of directly affecting the ability to offer products and services to customers (Martinelli et al. 2018). P1, P2, P3, P4, and P5 noted that small business owners must take disaster prevention planning seriously and follow the necessary guidelines issued by the disaster management authorities at national and local levels.

### Figure 2

*Disaster Planning and Response Guidelines Themes Generated from Participant*

*Interviews*



P1 stated that disaster prevention planning should be an ongoing process because disasters can happen any time but pointed out that small businesses lack the capacity and knowledge to implement successful business continuity plans. P1 explained that prior to the May 2011 tornado in Irving, Texas that affected his business, he put into action his disaster plan by ensuring that his business property, employees, and customers were communicated to and that there was enough insurance coverage for possible disaster damage. P1 further added that, after the 2011 tornado, as part of his business continuity plan, he fully cooperated with the local authorities to rebuild his business structures better to withstand the next storm of similar strength and force.

P2 stated that simply abiding by the guidelines issued by the emergency management teams at local and national levels made a big difference for his business in handling COVID-19 and being able to continue running his business. P2 also noted the importance of incorporating supply chain and vendor management selection into the overall disaster prevention process, and P3 agreed and said:

Right now, I have been able to restock because my vendors were pretty stocked up, but in some areas, it has been two to four weeks to get some products, but I have enough stocks to last me through this summer...vendors were also very understanding as they extended credits from 30 days to 40 days and this creates some cash flow to handle other priority areas during this COVID-19 disaster.

P4 stated in their planning they consider carefully how they select their vendors and, during disaster such as this, they request more credit period to accumulate enough time to recover and build cash reserve or revenue to be able to pay. P5 agreed that supply chain

and vendor management is integral part of an effective disaster planning and response guideline that can be activated when disaster strikes. P5 explained:

Planning should not only be focused on disaster event, but it should focus on those things that strengthen the overall sustainability of a business should a disaster strike. P5 added; and when disaster strikes, following the guidelines provided by the local, state, and national disaster agencies can make a huge positive survival difference.

On reviewing the documents explanations provided by the five participants in the form of planning charts, internal guidelines, and the local, state, and federal guidelines that participants of five small businesses use, disaster planning and response guidelines is a good risk mitigation strategy auto maintenance small business owner used to mitigate natural disaster.

The data collected from P1, P2, P3, P4, and P5 on disaster planning and response guideline were similar to the industry risk mitigation practice strategies for natural disaster prevention and recovery that begins with planning. Brown et al. (2018) reported that planning requires risk identification and management systems implementation based on the risk assessment outcome to help manage disaster. Researchers with the Business Continuity Institute (2018c) also noted that, in the case of Walgreens and the Hurricane Maria in Puerto Rico in 2017, the risk management team acted quickly and efficiently, activating their disaster, business continuity plans and their emergency operations center. Walgreens leaders were able to contain financial losses after disruption, and because of speedy recovery following their guidelines, Walgreens leaders built new business and

recover more quickly than competitors. Koonin (2020) argued that planning is not sufficient. Leaders should regularly test and update disaster plans to reduce harmful impacts to the business. Koonin (2020) further suggested that leaders' carrying out of regular tests and updates can protect employees' and customers' health and safety, limiting the negative impact of the disaster on the community and economy. Achieving growth requires focus and investment in resilience across intervention points before, during, and after adversity and all participants emphasized the importance of employee and customer safety during COVID-19 pandemic.

Business continuity management (BCM) is a way to provide organizations a systematic approach to augment the continuity of operations in the event of a crisis or disaster and aligns with Holling's (1973) organizational resilience theory (Disaster Recovery Institute, 2017). Suresh et al. (2020) concurred that business continuity management is part of organizational risk management and fits within organizational resiliency. It is a holistic management process that identifies potential threats to an organization and the possible impacts of these threats to business operations, thereby providing a framework for building organizational resilience, safeguarding the interests of its key stakeholders (Disaster Recovery Institute, 2017). Holling used the term to describe resilience in entities such as businesses, municipalities, and the government's ability to react and recover quickly from natural catastrophic disasters (Bastan et al., 2018).

In line with Holling's (1973) organizational resiliency theory, disaster planning and response guidelines are associated with the business continuity planning as an

extension of disaster planning. Disaster planning and response guidelines are critical for business operations in the event of a disruption and fit within the planned resilience component as a long-established mechanism intended to enable organizational leaders to manage the impacts of a disaster (Harrison & Williams, 2016; Hatton et al., 2016).

Business continuity plans include recommendations for how to reduce risk before an event, how to respond during an event, and what needs to happen after an event, and the focus of a disaster recovery plan is recovery (Cervone, 2017).

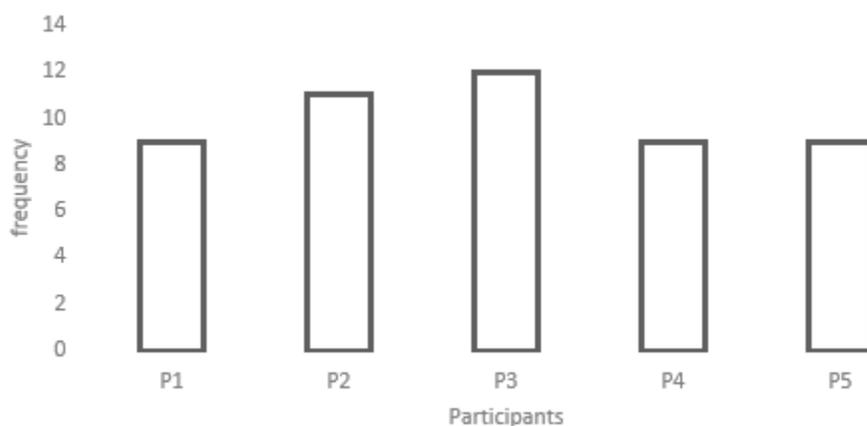
Reducing risk before an event and the planned response when a disaster occurs align with the stages involved in a disaster management program, namely actions before, during, and after disasters (Randolph, 2015). All five participants recognized the need of disaster planning and response guidelines and the need to incorporate supply chain and vendor management as integral part of business continuity strategy. Small businesses rely on their supply chains to deliver services to their customers and a resilient supply chain is a competitive advantage (Siegel, 2018). Linnenluecke (2017) noted that the disaster planning process may involve identifying, analyzing, evaluating, and responding to risks. Applying analytic techniques enhance and facilitate the risk assessment and management precipitates an enhanced risk assessment framework within the context of business continuity management (Linnenluecke (2017). P4 highlighted the importance of vendor relations within the disaster planning stage and that good relationships and collaboration with vendors enables better understanding and service when disaster strikes and, therefore, cultivating good understanding with a vendor is a good strategy.

### Theme 3: Communication

Communication was the third theme that emerged from the data collected from the participants. All five participants stated that communication is a strategy auto maintenance small business owner use to mitigate natural disasters.

**Figure 3**

*Communication Themes Generated from Participant Interviews*



Hatton et al. (2016) suggested identifying critical functions, developing a communication plan, creating information backups, training, and testing as some of the first steps in developing a successful business continuity plan. Winter (2020) agreed that training and communication through briefing of employees, cleaning staff or contractors on signs and symptoms of COVID-19, a strategy of Public Health England for dealing with an infectious disease threat can help. P1 stated:

We are always monitoring disaster situations and communicating to our employees verbally, email and through social media and this has been a success

since the COVID-19 this year and in May 2011 when tornado struck our business structures.

However, not all plans work as designed in a precrisis situation. In a crisis and emergency context, communication efforts must sometimes deviate from the planned strategies to suit circumstances (David & Carignan, 2017). Such was the case with P2, who stated:

When the ice storms and tornado hit us here in 1997 in Arkansas, all the power grid went down and that lasted for 3 days and so, without a generator, there was nothing much one could do even reaching the employees or my customers through social media.

P2 suggested that the use of a backup generator is a good strategic idea, which the business adopted from that experience. P2 further explained that in the current case of COVID-19, the business has been able to communicate effectively with the employees and ensuring that CDC guidelines are implemented to the later. P2 said:

We have requested our employees right from the beginning of this COVID-19 pandemic that they follow CDC guidelines including our internal guidelines that require them to let customers know that they have to wear face masks, wash their hands, social distance before they can come into our workspace...we recognize that some customers don't take such requests positively, but the safety of my employees is very important to allow customers who do not want to follow the CDC guidelines be in our premises for service.

P2 suggested that effective communication with the customers and employees has probably prevented the employees from being infected and will continue to monitor, observe, and implement the CDC guidelines. P3 explained that disaster prevention is all about following proven scientific guidelines and that they communicate the same to employees for their protection and said:

We wear face masks, wipe everything down and use hand sanitizer on our doors.

On the contrary, for our customers, we ask them to wear face masks but if they don't, we don't run them off because we do not know if they have a condition and do not want to ask them about that.

P3 stated that effective communication to employees regarding reduced hours was instrumental in getting the employees to accept to work for less hours. In communicating with the employees regarding some strategic actions on COVID-19, P3 explained:

I pretty much told everybody that in the next three months, the company has to reduce employee hours to 30 because of the COVID-19 and I assure you all that we are going nowhere this is just a temporary measure.

P4 stated that communicating to their employees and vendors was instrumental in getting them where they are now. Effective communication during the COVID-19 peak in the months of February to May 2020 enabled them to reduce employee hours and extend credit periods with their vendors including getting a slight bank assistance of \$10,000 that was used for employees. P4 was not able to get EDL loans that were being provided by the federal government for businesses.

P5 explained that he relied on the media and other social networks to learn about the COVID-19 pandemic and communication is important and blamed the government for not communicating effectively about the disaster. P5 suggested that the government and the state and local agencies should have communicated better because that affected how business owners relayed the seriousness of the pandemic to their employees and families. All five companies had some form of company communication policy and the use of email and social media, employee phones, and immediate emergency contact phone numbers were visible in the documents. Möller et al. (2018) recommended using social media to communicate before and after a disaster.

Communication strategies can be used to enhance or build specific resilience. Brown et al. (2019) suggested effective communication can be used to train staff or employees on disaster risk mitigation strategies. Barrios (2016) noted that organizations can be well prepared to adapt to uncertainty with good training and communication. The use of social media and traditional media can be used to increase communication and collaboration during a crisis (Sakurai et al., 2014). All participants agreed on the importance of disaster communication as a preventive tool. How disaster prevention planning or implementation is communicated to parties that matter including employees is important. Risk recognition and the provision of timely and up-to-date information from reliable sources based on preparedness plans, as in the case of COVID-19 pandemic are the most effective solution to risk assessment and awareness (WHO, 2020).

When disaster strikes, effective communication channels are key to managing the disaster effectively (Cole et al., 2017; David & Carignan, 2017). Abunyewah et al. (2018)

noted that communication variables such as communication source, channel, and message content dictate the effectiveness of conveying risk messages to at-risk individuals and societies. In addition, the source of communication can encompass all people, entities, and institutions, such as public authorities, flood managers, media personalities, friends, family members, and neighbors, who initiate a communication to the public.

The importance of disaster communication is supported in the literature and aligns with the Holling (1973) organizational resiliency theory. Holling (2001) noted that the three critical characteristics required by individuals or business owners to accomplish resilience are the capacities of learning and adaptation, a high degree of self-organization, and network connectedness. Communication is a key vessel that can be used effectively to improve learning and adaptation, a high degree of self-organization and network in the 21<sup>st</sup> century. Having a well laid out and concise business continuity plan that clearly communicates how a business will respond during an event can help mitigate risk and is an effective investment (Blackhurst et al., 2018; Sullivan, 2017; Travelers Insurance, 2019b). Abunyewah et al. (2018) noted prevention and mitigation plans should address, among other things, emergency response, public relations, resource management, employee communications, and all interested parties.

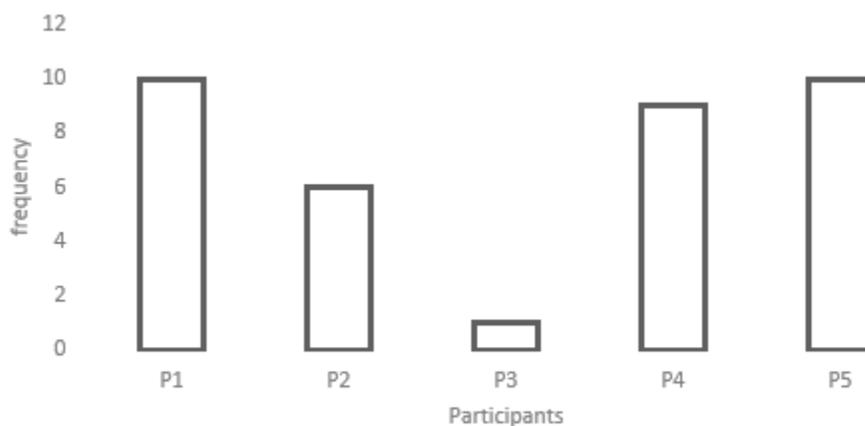
#### **Theme 4: Partnership and Collaboration**

Small businesses need each other within the supply chain network as a disaster preventive measure. Trust, cooperation, and commitment among supply chain partners can lead to arrangements where all share risk or reduce risk arising from supply chain vulnerabilities (Chowdhury & Quaddus, 2016). Likewise, in the disaster prevention and

management field, internal training of employees and disaster prevention program development through business collaboration before an event occurs is important, and could be the first step of enabling employees, understand the importance and magnitude of disaster preparation (Halkos et al., 2018). Small business participation in Public and Private Partnership within the disaster prevention agencies at local, state, and federal level can help businesses prevent and mitigate natural disaster impacts.

**Figure 4**

*Partnership and Collaboration Themes Generated from Participant Interviews*



However, inadequate responses to natural disasters by federal, local, and state authorities can erode the public's and business community's trust and confidence in public private partnerships (Miller, 2016). The Katrina storms and now the COVID-2019 pandemic have amplified the need for enhanced small business involvement in the public private partnership through collaboration. All the study participants noted the importance of partnership and collaboration as a strategy used by small business owners to mitigate natural disaster. P1 noted:

In post disaster after a tornado in Irving Texas in 2011, I cooperated with the city and disaster management team including the assigned city contractors to get new building permits after conforming with the building codes requirements and that partnership was helpful to build back better and stronger.

Applying and enforcing realistic, risk compliant building regulations and land use planning for businesses and communities can help improve business resiliency (Weichselgartner & Kelman, 2015).

P2 stated that collaborating with disaster agencies such as FEMA and the SBA helped during the current COVID-19 pandemic, helping businesses get financial support under the PPP program to cover employee salaries and keep the businesses open after the pandemic crest. P2 added that paying taxes on time made his application process easy as compared to small businesses that had not done their previous year's taxes on time.

P3 noted that collaboration with the SBA through the PPP bank facility helped take them through the pandemic. P3 stated:

Collaboration is important and my bank was incredibly supportive. We had to get PPP to keep employees paid as the sales were extremely low. So, PPP, payroll protection program really helped us to protect our employees.... We were one of the first ones to apply for help at my bank. My bank did well for getting us the money and it really helped.

P4 emphasized on the importance of partnership and collaboration and suggested that it made them survive the peak of COVID-19 pandemic in the months of February to May.

P5 did not apply for nor receive any financial support from the SBA nor the PPP

program. P5 stated that they are a small business and never got help but used their savings to get through the pandemic. P5 added that collaboration with other business within the community was helpful as they could assist each other with tools of work by sharing with each other during the pandemic because of supplies shortage. P5 insisted that his background as coming from a business family and strong cultural ties have made him succeed in his business for over 15 years. Monllor et al. (2020) supported a link between people's behaviors and attitudes that may create connection to resiliency capabilities. The link or connection between people's behaviors, attitudes, and tendency for resiliency may vary cognitively, emotionally, or culturally (Adame & Miller, 2016). All five participants had positive assessments of collaboration and partnership whether within community or with the local, state, or federal resources available for coordination and collaboration.

The information provided by the participants may contribute to existing literature on the importance of collaboration and partnership to mitigate natural disaster. Leaders in governments and the relevant federal, state, and local agencies should tailor local policies to be conducive for small businesses to engage in disaster preparedness programs. The COVID-19 pandemic has demonstrated that federal, local, and state agencies can help small businesses mitigate natural disaster impact. Bridging the gap on policy implementation at national and local administrative levels can help improve the participation of small businesses in the implementation of business continuity programs and thereby help improve resilience levels (Alcántara-Ayala, 2019; Hatton et al., 2016).

Drennan and Morrissey (2019) noted the importance of managing disaster at local level to help build community resilience. P1, P2, P3, P4, and P5 all agreed and aligned with the importance of disaster management collaboration at local level with disaster agencies and community disaster support groups. Alexander (2015) also noted the importance of decentralizing disaster management at local level. Awareness creation and participation by small business owners in business continuity planning, to lessen disaster impacts when they happen, would be a step in the right direction. Collaboration and partnership within an organization supports the enhancement of resiliency by enabling a business to recover and get back to work quickly. Adekola (2018) noted resiliency is based on sustainability of function, structure, and identity in a way that highlights maintaining way of life following an emergency and is in line with Holling's (1973) theory of organizational resilience.

### **Applications to Professional Practice**

Belhadi et al. (2020) noted that localized supply sources and industry, technologies, real time information sharing, and business continuity were identified as the significant strategies used by businesses during the COVID-19 pandemic disaster. The selection of the supply chain vendors suitable to individual business operation is critical for business continuity and survival. During the COVID-19 pandemic, goods and services distribution was impacted. Organizations typically consider their employees as their most important asset and should be part of their business continuity strategy, and this is normally tested when disaster strikes (Serrano & Kazda, 2020). Hatton et al. (2016) noted that business continuity management is relevant to the long-term

competitiveness of an organization and employees are mostly impacted by being displaced when disaster such as pandemic, tornado, storms, flood, or Hurricane strikes and their safety, income, wellbeing, and job security should always be part of a well-designed business continuity planning. Finding the business risk management strategies that independently owned auto maintenance businesses use to mitigate natural disaster can improve business performance and ensure business continuity.

I conducted a qualitative multiple case study with independently owned auto maintenance business owners in Texas, Arkansas, and Louisiana. The following four principle themes emerged: (a) employee relations and financial strength, (b) disaster planning and response guideline, (c) communication, and (d) collaboration and partnership. The findings of this study could contribute towards improving business practice by providing relevant information on how to mitigate disaster impact through business continuity strategies. Specifically, the themes and the shared responses from the participants could be used by independently owned auto maintenance businesses owners to prevent and mitigate natural disaster when it happens, thereby minimizing the chances of going out of business or having to deal with reduced profitability.

Based on the responses of the independently owned auto maintenance businesses owners, employee relations and financial strength were significant in enabling a better environment for businesses to mitigate natural disaster when it happens. Employees are key assets Employee talent disruption takes place after a disaster when employees get displaced. Sydnor et al. (2017) noted that in the post-Katrina period, this was the second strongest predictor of business recovery after loss of customers. Employee financial

inclusion is required at times of disaster for improving their living conditions and availability post-disaster (Sarma & Pais 2011), and financial support for small businesses and individual from the government and banks is important in the COVID-19 pandemic times as was expressed by all five participants.

Disaster planning and response guidelines were another important theme that emerged. The participants discussed in the interviews, the importance of disaster planning and response guideline. All five participants noted the importance of accessing and making available disaster prevention guidelines from the federal, state, and local agencies. Disaster planning is critical for business operations in the event of a disruption and fits within the planned resilience component as a long-established mechanism intended to enable organizational leaders to manage the impacts of a disaster (Harrison & Williams, 2016; Hatton et al., 2016). Independently owned auto maintenance businesses owners could use strategies observed in this study to mitigate natural disaster.

Communication was another important theme that emerged. The participants explained the importance of communication in disaster situations to keep employees safe and to protect company assets. Communication is not only restricted to employees but extends to customers and vendors including collaboration facilitation with the supply chain partners. It was noted that alternative means of communication in disaster situation must always be put ready. In a crisis and emergency context, communication efforts must sometimes deviate from the planned strategies to suit circumstances (David & Carignan, 2017). The communication concepts and methods identified by participants in this study

can be used by independently owned auto maintenance business owners to mitigate natural disaster.

Collaboration and partnership were important for all five participants. All five participants highlighted the importance of collaboration and partnership in their organizations. Companies that collaborate by sharing information in their industry are less likely to be extensively impacted by a disruption when a disaster occurs (Revilla & Saenz, 2017). Sahebjamnia et al. (2018) noted that the increasing number of natural hazards is forcing organizations to build resilience against numerous types of disruptions that threaten the continuity of their business processes. Colicchia et al. (2019) agreed collaboration through information sharing can be leveraged to mitigate disasters and help improve business resiliency. Businesses can improve resilience through network collaboration within their respective industry. After conducting this study, the findings presented herein, reflects the strategies independently owned business owners in the auto maintenance businesses industry can implement to mitigate natural disaster. The implementation of the strategies from the findings of this study by businesses could contribute to and herald positive social change, by potentially improving the lives of small business owners and others in the community, consequent to safeguarding, insuring, and displaying risk mitigation prudence.

### **Implications for Social Change**

Several positive social change implications may be associated with findings of this study. The identified strategies and processes in this study could be used by business owners to improve participation in business continuity programs and thereby enhance

disaster resiliency. The first major implication is that disaster mitigation leads to business continuity and hence profitability and retention of employees. Business owners who do not plan and prepare for disasters to avoid harmful disruptions may face closure when disaster strikes (Hatton et al., 2016). Another implication for disaster mitigation strategy implementation is that the business community feels safe on credit line extension should a disaster happen. Leaders of corporations who fail to prepare for the inevitable by failing to construct a comprehensive BC/DRP do their stakeholders a disservice (Cook, 2015). Additionally, implementation of disaster mitigation strategies allows the business owner to be in business. Small business owners may be at greater risk of losing market share in the event of a disaster than the leaders of large corporations are, especially those without effective disaster strategies (FEMA, 2015b; Sahebjamnia et al., 2015). Additionally, improved survival of small businesses may result in more job opportunities, a continuation of income for employees and their families, and a positive contribution to state and local economies. Sharing successful strategies of the owners of businesses that have survived disasters may help other business owners avoid the failure or demise of their business resulting from disasters.

To increase awareness of the importance of natural disaster mitigation strategies in the business arena, I will disseminate the findings of this study at seminars, training events, and small business clubs and organizations. The study will also be shared within the digital platforms and business associations of the independently owned auto maintenance industry within my community. Finally, ProQuest/UMI, the dissertation database used by scholars, will publish this research study.

### **Recommendations for Action**

The information presented in this study can be used by independently owned auto maintenance businesses to mitigate natural disaster. Employees are important in an organization's business continuity and resiliency structure and so are other structural assets (Hatton et al. 2016; Sullivan 2017). While the supply chain structure ensures the fulfillment of customer's needs, employees' safety should be the primary focus in a business continuity and resiliency strategy (Sullivan 2017). Independently owned auto maintenance businesses owners should consider this study's findings because if they understand and successfully execute these natural disaster mitigation strategies, the business continuity and resiliency capability of their organizations will likely improve.

The independently owned auto maintenance business owners may adopt some or all the strategies the participants in this study shared to effectively mitigate natural disaster. I recommend that the independently owned auto maintenance owners who are actively trying to engage in business continuity and resiliency practices adopt the four strategies: (a) employee relations and financial strength, (b) disaster planning and response guidelines, (c) communication, and (d) collaboration and partnership. The COVID-19 pandemic disaster forced companies to incorporate business continuity strategies such as work from home (WFH) by employees to render their business services and goods. Businesses must prepare operational plans for returning to work within structural offices. As of June 2020, some 55.7% had trained staff in new policies on health protocols, visitors, illness reporting, and working from home (Business Continuity Institute, 2020). In addition, staff are more receptive to training since the pandemic

started due to an increased visibility of business continuity/resilience and the procedures attached to it (Business Continuity Institute, 2020).

To increase awareness of the importance of natural disaster mitigation strategies in the business arena or the independently owned auto maintenance industry, I will make available digital copies of this research via digital platforms, the auto maintenance industry and the auto industry. I will also circulate the findings of this study within auto maintenance organizations and participate in seminars that require information on strategies pertaining to strategies independently owned auto maintenance owners use to mitigate disaster. Finally, I will publish this this research study on ProQuest/UMI, the dissertation database and repository which houses scholarly research.

### **Recommendations for Further Research**

The purpose of this qualitative multi-case study was to explore the strategies independently owned auto maintenance small businesses owners use to mitigate natural disaster in Texas and the surrounding states. The target population was five independently owned auto maintenance business owners located in Texas and the surrounding states. I recommend that quantitative methodology be used in future research to compare the effectiveness and relationship of the different strategies used to mitigate natural disaster in the independently owned auto maintenance small businesses. Future researchers may also conduct further studies in different geographic location with larger sample size.

Recommendations for further research additionally may include obtaining data from other auto industry segment or industries. I conducted a qualitative multi-case

research study focusing on five business owners in the independent auto maintenance industry. Future researchers may also contribute to the understanding of natural disaster mitigation strategies by conducting a single case study. Conducting a single case study would facilitate a researcher to focus on one entity for future comparison and insight. In addition, further research can provide the required feedback to auto maintenance owners to help them implement successful natural disaster mitigation strategies to help them improve their chances of withstanding disasters and continue to be in business.

### **Reflections**

This has been one tough experience for me, and the ups and downs have been remarkable if not refreshing. I wanted a higher institution that would offer me a very engaging online learning space with good instructors and so, I took the first step of praying for God to give me the right institution. Not only was I blessed to be at Walden, but I was also assigned the best chair and committee members to help me navigate my doctoral journey. Walden University was recommended to me by my former Walden DBA student and my Instructor at Keller Graduate School of Management. In 2016, after graduating from Keller, I applied at Walden for my DBA and was accepted, commencing my journey in 2017. The challenges manifested immediately, I had to find a way of balancing work, family, and school. That has not been easy. I had to resign twice from work because of conflicting schedules with my doctorate program.

I do not have any business experience in the auto maintenance business, nor did I have any prior contact with the participants for this study. As a researcher, I am cognizant of the existence of personal bias experienced in a particular field related to the topic. I

used the interview protocol (see Appendix A) prior to collecting data. I concluded by conducting member checking with the participants to ensure that the captured information they gave during the interview was correct.

A personal view of the natural disaster mitigation strategies has been impacted greatly. With the COVID-19 emergence and the findings in this study, the employee is central in disaster mitigation strategies. Thinking prior to this study was that structural assets have been the focus of natural disaster mitigation strategies studies. However, as we move into the future, the focus will continue to tilt toward the employee as types of disasters such as the COVID-19 continue to emerge. Business owners need to focus and implement natural disaster mitigation strategies that embrace the human element into their Business continuity programs for their organizational resiliency improvement. The findings shown in this study included successful and valid strategies that can be used in organizations to increase natural disaster mitigation strategies for the respective organizations.

### **Conclusion**

The purpose of this qualitative multi-case study was to explore strategies independently owned auto maintenance business owners use to mitigate natural disaster. Organizations that apply business continuity strategies to mitigate natural disaster with employee as a focus are more likely to survive. Data were collected from company documents, website and participants interviews to explore strategies that independently owned auto maintenance business owners use to mitigate natural disaster. In this study, Holling's (1973) organizational resiliency theory served as the framework and

underpinning. Four themes emerged from the data collected: (a) employee relations and financial strength, (b) disaster planning and response guidelines, (c) communication, and (d) collaboration and partnership. The findings revealed that business owners must adopt natural disaster mitigation strategies that embrace employees as a focus to survive.

## References

- Abe, M., & Ye, L. (2013). Building resilient supply chains against natural disasters: The cases of Japan and Thailand. *Global Business Review, 14*(4), 567–586.  
<https://doi.org/10.1177/0972150913501606>
- Abdalla, M. M., Oliveira, L. G. L., Azevedo, C. E. F., & Gonzalez, R. K. (2018). Quality in qualitative organizational research: Types of triangulation as a methodological alternative. *Administração: Ensino e Pesquisa; Rio De Janeiro, 9*(1), 66–98.  
<https://doi.org/10.13058/raep.2018.v19n1.578>
- Abunywah, M., Gajendran, T., & Maund, K. (2018). Conceptual framework for motivating action towards disaster preparedness through risk communication. *Procedia Engineering, 212*, 246–253.  
<https://doi.org/10.1016/j.proeng.2018.01.032>
- Adame, B., & Miller, C. H. (2016). Vested interest: Developing scales for assessing flooding preparedness. *Disaster Prevention and Management: An International Journal, 25*(3), 282-297. <https://doi.org/10.1108/dpm-08-2015-0196>
- Adekola, J. (2018). Resilience from a lived-experience perspective in the regional context of Dumfries and Galloway, Scotland. *International Journal of Disaster Risk Reduction, 31*, 441–448. <https://doi.org/10.1016/j.ijdrr.2018.06.006>
- Alahmad, G., Al Jumah, M., & Dierickx, K. (2015). Confidentiality, informed consent, and children’s participation in research involving stored tissue samples: Interviews with medical professionals from the Middle East. *Narrative Inquiry in Bioethics; Baltimore, 5*(1), 53–66. <https://doi.org/10.1353/nib.2015.0013>

- Alcántara-Ayala, I. (2019). Time in a bottle: Challenges to disaster studies in Latin America and the Caribbean. *Disasters*, 43(51), S18–S27.  
<https://doi.org/10.1111/disa.12325>
- Alexander, D. E. (2013). Resilience and disaster risk reduction: An etymological journey. *Natural Hazards and Earth System Sciences*, 13(11): 2707–2716.  
<https://doi.org/10.1177/0972150913501606>
- Alexander, D. E. (2015). Evaluation of civil protection programs, with a case study from Mexico. *Disaster Prevention and Management: An International Journal*, 24(2), 263–283. <https://doi.org/10.1108/DPM-12-2014-0268>
- Ali, I., Nagalingam, S., & Gurd, B. (2018). A resilience model for cold chain logistics of perishable products. *International Journal of Logistics Management*, 29(3), 922–941. <https://doi.org/10.1108/IJLM-06-2017-0147>
- Ali, A., Mahfouz, A., & Arisha, A. (2017). Analyzing supply chain resilience: integrating the constructs in a concept mapping framework via a systematic literature review. *Supply Chain Management: An International Journal*, 22(1), 16–39.  
<https://doi.org/10.1108/SCM-06-2016-0197>
- Anderson, V. (2017). Criteria for evaluating qualitative research. *Human Resource Development Quarterly*, 28(2), 125–133. <https://doi.org/10.1002/hrdq.21282>
- Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research. *Journal of Emerging Trends in Educational Research and Policy Studies*, 5(2), 272–281.  
<http://196.44.162.10:8080/xmlui/bitstream/handle/123456789/256/Ensuring%20t>

[he%20Quality%20of%20the%20Findings%20of%20Qualitative%20Research%20ONEW.pdf?sequence=1&isAllowed=y](#)

- Archibald, M. M. (2016). Investigator triangulation: A collaborative strategy with potential for mixed methods research. *Journal of Mixed Methods Research, 10*(3), 228–250. <https://doi.org/10.1177/1558689815570092>
- Ariza, E., Lindeman, K. C., Mozumder, P., & Suman, D. O. (2014). Beach management in Florida: Assessing stakeholder perceptions on governance. *Ocean and Coastal Management, 96*, 82–93. <https://doi.org/10.1016/j.ocecoaman.2014.04.033>
- Auzzir, Z., Haigh, R., & Amaratunga, D. (2018). Impacts of disaster to SMEs in Malaysia. *Procedia Engineering, 212*, 1131–1138. <https://doi.org/10.1016/j.proeng.2018.01.146>
- Bamkin, M., Maynard, S., & Goulding, A. (2016). Grounded theory and ethnography combined. *Journal of Documentation, 72*(2), 214–231. <https://doi.org/10.1108/JD-01-2015-0007>
- Bandura, A. (1997). The science of health promotion. *American Journal of Health Promotion, 12*(1), 8–10. <https://doi.org/10.1177/1090198104263660>
- Barratt, M. J., Ferris, J. A., & Lenton, S. (2015). Hidden populations, online purposive sampling, and external validity: Taking off the blindfold. *Field Methods, 27*(1), 3–21. <https://doi.org/10.1177/1525822X14526838>
- Barbour, J. B., Doshi, M. J., & Hernández, L. H. (2016). Telling global public health stories. *Communication Research, 43*(6), 810–843. <https://doi.org/10.1177/0093650215579224>

- Barreto, I. (2010). Dynamic capabilities: A Review of past research and an agenda for the future. *Journal of Management*, 36(1), 256–280.  
<https://doi.org/10.1177/0149206309350776>
- Barrios, R. E. (2016). Resilience: A commentary from the vantage point of anthropology. *Annals of Anthropological Practice*, 40(1), 28–38.  
<https://doi.org/10.1111/napa.12085>
- Başkarada, S. (2014). Qualitative case study guidelines. *Qualitative Report*, 19(1), 1-18.  
<http://tqr.nova.edu>
- Bastan, O., Benesl, T., & Fiedler, P. (2018). Resiliency, the path to safety II. *IFAC-Papers On Line*, 51, 468–472. <https://doi.org/10.1016/j.ifacol.2018.07.105>
- Belhadi, A., Kamble, S., Jabbour, C. J. C., Gunasekaran, A., Ndubisi, N. O., & Venkatesh, M. (2020). Manufacturing and service supply chain resilience to the COVID 19 outbreak: Lessons learned from the automobile and airline industries. *Technological Forecasting & Social Change*, 163, 120447.  
<https://doi.org/10.1016/j.techfore.2020.120447>
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2, 8-14. <https://doi.org/10.1016/j.npls.2016.01.001>
- Benoot, C., Hannes, K., & Bilsen, J. (2016). The use of purposeful sampling in a qualitative evidence synthesis: A worked example on sexual adjustment to a cancer trajectory. *BMC Medical Research Methodology*, 16(21), 1–12.  
<https://doi.org/10.1186/s12874-016-0114-6>

- Bergström, J. (2018). An archaeology of societal resilience. *Safety Science*, 110(Part C), 31–38. <https://doi.org/10.1016/j.ssci.2017.09.013>
- Betz, F. (2016). Contextual methodology in the social sciences: Historiography, middle-range-theory, & models. *Advances in Social Sciences Research Journal*, 3(7). <https://doi.org/10.14738/assrj.37.2108>
- Bevan, M. (2014). A method of phenomenological interviewing. *Qualitative Health Research*, 24(1), 136-144. <https://doi.org/10.1177/1049732313519710>
- Bevilacqua, M., Ciarapica, F. E., & Marcucci, G. (2018). A modular analysis for the supply chain resilience triangle. *IFAC-PapersOnLine*, 51(11), 1528–1535. <https://doi.org/10.1016/j.ifacol.2018.08.280>
- Birkie, S. E. (2016). Operational resilience and lean: In search of synergies and trade-offs. *Journal of Manufacturing Technology Management*, 27(2), 185–207. <https://doi.org/10.1108/JMTM-07-2015-0054>
- Blackhurst, J., Rungtusanatham, M. J., Scheibe, K., & Ambulkar, S. (2018). Supply chain vulnerability assessment: A network-based visualization and clustering analysis approach. *Journal of Purchasing and Supply Management*, 24(1), 21–30. <https://doi.org/10.1016/j.pursup.2017.10.004>
- Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research: An International Journal*, 19(4), 426-432. <https://doi.org/10.1108/QMR-06-2016-0053>
- Bourdieu, P. (1986). The forms of capital. In J. Richardson, (Ed.), *Handbook of theory and research for the sociology of education*. Greenwood.

Brakenridge, G. R. (2019). *Global active archive of large flood events*. Dartmouth Flood Observatory, University of Colorado.

<https://floodobservatory.colorado.edu/Archives/index.html>

Brooks, J. S., & Normore, A. H. (2015). Qualitative research and educational leadership: Essential dynamics to consider when designing and conducting studies.

*International Journal of Educational Management*, 29, 798-806.

<https://do.org/10.1108/IJEM-06-2015-0083>

Bromley, E., Mikesell, L., Jones, F., & Khodyakov, D. (2015). From subject to participant: Ethics and the evolving role of community in health research.

*American Journal of Public Health; Washington*, 105(5), 900–908.

<https://ajph.aphapublications.org/>

Brown, C., Stevenson, J., Giovinazzi, S., Seville, E., & Vargo, J. (2015). Factors influencing impacts on and recovery trends of organizations: Evidence from the 2010/2011 Canterbury earthquakes. *International Journal of Disaster Risk*

*Reduction*, 14, 56–72. <https://doi.org/10.1016/j.ijdrr.2014.11.009>

Brown, N. A., Rovins, J. E., Feldmann-Jensen, S., Orchiston, C., & Johnston, D. (2018).

Measuring disaster resilience within the hotel sector: An exploratory survey of Wellington and Hawke's Bay, New Zealand hotel staff and managers.

*International Journal of Disaster Risk Reduction*.

<https://doi.org/10.1016/j.ijdrr.2018.09.014>

- Brusset, X., & Teller, C. (2017). Supply chain capabilities, risks, and resilience. *International Journal of Production Economics*, 184, 59–68.  
<https://doi.org/10.1016/j.ijpe.2016.09.008>
- Business Continuity Institute. (2013). Annual supply chain resilience report.  
<http://www.thebci.org>
- Business Continuity Institute. (2018a, November). Business continuity management good practice guidelines: A management guide to implementing global good practice in business continuity management. Retrieved from <http://www.thebci.org>
- Business Continuity Institute. (2018b). Business continuity management good practice guidelines: A management guide to implementing global good practice in business continuity management. <http://www.thebci.org>.
- Business Continuity Institute. (2018c). 2018-global-bci-continuity-resilience-effective-recovery-winner-walgreens. <https://www.thebci.org>
- Business Continuity Institute. (2020). BCI's 6th Coronavirus Organizational Preparedness Survey. <https://www.thebci.org>
- Bryman, A. (2015). *Social research methods* (5th ed.). Oxford University Press.
- Byrne, O., & Shepherd, D. A. (2015). Different strokes for different folks: entrepreneurial narratives of emotion, cognition, and making sense of business failure. *Entrepreneurship, Theory and Practice*, 39(2), 375-405.  
<https://doi.org/10.1111/etap.12046>
- Cagnin, F., Oliveira, M. C., Simon, A. T., Helleno, A. L., & Vendramini, M. P. (2016). Proposal of a method for selecting suppliers considering risk management.

*International Journal of Quality & Reliability Management*, 33(4), 488-498.

<https://doi.org/10.1108/IJQRM-11-2014-0172>

Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5), 545-547.

<https://doi.org/10.1188/14.ONF.545-547>

Centers for Disease Control and Prevention. (2020). Coronavirus Disease 2019 (COVID-19). <https://www.cdc.gov/coronavirus/2019-ncov/communication/guidance.html>

Cervone, H. F. (2017). Disaster recovery planning and business continuity for informaticians. *Digital Library Perspectives*, 33(2), 78–81.

<https://doi.org/10.1108/DLP-02-2017-0007>

Chang, W., Ellinger, A. E., & Blackhurst, J. (2015). A contextual approach to supply chain risk mitigation. *International Journal of Logistics Management*, 26(3), 642–

656. <https://doi.org/10.1108/IJLM-02-2014-0026>

Chelleri, L., Minucci, G., & Skrimizea, E. (2016). Does community resilience decrease social–ecological vulnerability? Adaptation pathways trade-off in the Bolivian Altiplano. *Regional Environmental Change*, 16(8), 2229–2241.

[https://doi.org/10.1007/822\\_s10113-016-1046-8](https://doi.org/10.1007/822_s10113-016-1046-8). 823

Chelleri, L., Waters, J. J., Olazabal, M., & Minucci, G. (2015). Resilience trade-offs: 824 addressing multiple scales and temporal aspects of urban resilience. 825

*Environment and Urbanization*, 27, 181–198. <https://doi.org/10.1177/826>

[0956247814550780](https://doi.org/10.1177/8260956247814550780)

- Choi, M., & Roulston, K. (2015). Learning transfer in practice: A qualitative study of medical professionals' perspectives. *Human Resource Development Quarterly*, 26, 249 – 273. <https://doi.org/10.1002/hrdq.21209>
- Chow, and Chan, L.S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management*, 45(7), 458-465. <https://doi.org/10.1016/j.im.2008.06.007>
- Chowdhury, M. F. (2015). Coding, sorting and sifting of qualitative data analysis: Debates and discussion. *Quality & Quantity*, 49, 1135-1143. <https://doi.org/10.1007/s11135-014-0039-2>
- Chowdhury, M. M. H., & Quaddus, M. (2016). Supply chain readiness, response and recovery for resilience. *Supply Chain Management: An International Journal*, 21(6), 709–731. <https://doi.org/10.1108/SCM-12-2015-0463>
- Cole, M. A., Elliott, R. J. R., Okubo, T., & Strobl, E. (2017). Predisaster planning and post-disaster aid: Examining the impact of the great East Japan Earthquake. *International Journal of Disaster Risk Reduction*, 21, 291–302. <https://doi.org/10.1016/j.ijdr.2016.12.015>
- Colicchia, C., Creazza, A., Noè, C., & Strozzi, F. (2019). Information sharing in supply chains: a review of risks and opportunities using the systematic literature network analysis (SLNA). *Supply Chain Management*, 24, 5–21. <https://doi.org/10.1108/SCM-01-2018-0003>

Cook, J. (2015). A six-stage business continuity and disaster recovery planning cycle.

*SAM Advanced Management Journal* (07497075), 80(3), 23–68.

<https://samnational.org>

Connelly, L. M. (2016). Trustworthiness in qualitative research. *MedSurg Nursing*, 25,

435-437. <https://www.amsn.org/>

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The

Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, 18, 76–

82. <https://doi.org/10.1002/da.10113>

Constantinou, C. S., Georgiou, M., & Perdikogianni, M. (2017). A comparative method

for themes saturation (CoMeTS) in qualitative interviews. *Qualitative Research*,

17(5), 571–588. <https://doi.org/10.1177/1468794116686650>

Corey, C. M., Deitch EA (2011) Factors affecting business recovery immediately after

Hurricane Katrina. *Journal of Contingencies Crisis Management* 19,169–181

<https://doi.org/10.1111/j.1468-5973.2011.00642.x>

Crimes and Criminal Procedure, 18 U.S.C. Chapter 113B: Terrorism, §2331.

<http://uscode.house.gov/view.xhtml?path=/prelim@title18/part1/chapter>

[113B&edition=prelim](http://uscode.house.gov/view.xhtml?path=/prelim@title18/part1/chapter)

Crowe, M., Inder, M., & Porter, R. (2015). Conducting qualitative research in mental

health: Thematic and content analysis. *Australian & New Zealand Journal of*

*Psychiatry*, 49, 616-623. <https://doi.org/10.1177/0004867415582053>

Cronin, C. (2014). Using case study research as a rigorous form of inquiry. *Nurse*

*Researcher*, 21(5), 19–27. <https://doi.org/10.7748/nr.21.5.19.e1240>

- Cypress, B. S. (2017). Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimensions of Critical Care Nursing*, 36, 253-263.  
<https://doi.org/10.1097/DCC.0000000000000253>
- d'Andria, A., Gabarret, I., & Vedel, B. (2018). Resilience and effectuation for a successful business takeover. *International Journal of Entrepreneurial Behavior & Research*, 24(7), 1200–1221. <https://doi.org/10.1108/IJEBR-11-2016-0367>
- Da Silva, T. M., De Resende Melo, P. L., Esteves, K., & Gomes, G. (2016). Franchisee association and its mediation of relationship. *Revista De Administração Mackenzie*, 17, 138-165. <https://doi.org/10.1590/1678-69712016/administracao.v17n5p138-165>
- Das, R. (2018). Disaster preparedness for better response: Logistics perspectives. *International Journal of Disaster Risk Reduction*, 31, 153–159.  
<https://doi.org/10.1016/j.ijdr.2018.05.005>
- David, M. D., & Carignan, M.-E. (2017). Crisis communication adaptation strategies in the MM&A train explosion in Lac-Mégantic downtown: Going back to field communication. *Corporate Communications: An International Journal*, 22(3), 369–382. <https://doi.org/10.1108/CCIJ-02-2016-0022>
- Derahman, R. (2017). A Preliminary study on consumption experience of social support towards life satisfaction. *Global Business and Management Research; Boca Raton*, 9(1s), 555–571. <http://www.gbmr.ioksp.com>

Despard, M. R., Frank-Miller, E., Fox-Dichter, S., Germain, G., & Conan, M. (2020).

Employee financial wellness programs: Opportunities to promote financial inclusion? *Journal of Community Practice*, 28(3), 219–233.

<https://doi.org/10.1080/10705422.2020.1796878>

Dhs.gov. (2012, July 17). National terrorism advisory system.

<https://www.dhs.gov/national-terrorism-advisory-system>

Dikova, D., & Schoenung, B. (2016). Reflections on organizational team diversity

research: In search of a logical support to an assumption. *Equality, Diversity and Inclusion: An International Journal*, 35(3), 221–231. [https://doi.org/10.1108/EDI-](https://doi.org/10.1108/EDI-11-2015-0095)

[11-2015-0095](https://doi.org/10.1108/EDI-11-2015-0095)

Davlasheridze, M., & Geylani, P. (2017). Small business vulnerability to floods and the effects of disaster loans. *Small Business Economics*, 49(4), 865–888.

<https://doi.org/10.1007/s11187-017-9859-5>

Denzin, N. K. (2017). Critical qualitative inquiry. *Qualitative Inquiry*, 23, 8–16.

<http://doi.org/10.1177/1077800416681864>

Denzin, N. K., & Lincoln, Y. S. (2011). *The Sage handbook of qualitative research* (4th ed.). Sage.

Doody, O., & Doody, C. M. (2015). Conducting a pilot study: Case study of a novice researcher. *British Journal of Nursing*, 24(21), 1074–1078.

<https://doi.org/10.12968/bjon.2015.24.21.1074>

- Drachal, M. (2017). Coordinating management disciplines to build operational resilience in response to a major crisis situation. *Journal of Business Continuity & Emergency Planning*, 11(2), 174–183. <http://www.businesscontinuityjournal.com/>
- Drennan, L., & Morrissey, L. (2019). Resilience policy in practice—Surveying the role of community based organisations in local disaster management. *Local Government Studies*, 45(3), 328–349. <https://doi.org/10.1080/03003930.2018.1541795>
- DRI International. (2020). Business continuity management. <https://drii.org/>
- Duarte, F. de P. (2017). Sustainability learning challenges in a Brazilian government organization. *International Journal of Organizational Analysis; Bingley*, 25(4), 562–576. <https://doi.org/10.1108/IJOA-02-2015-0842>
- Dweck, C. S. (2016), *Mindset: The New Psychology of Success* (2nd ed.). Ballantine
- Elmqvist, T. (2017). Development: Sustainability and resilience differ. *Nature*, 546(7658), 352. <https://doi.org/10.1038/546352d>
- Emanuel, K. E., 2017: Assessing the present and future probability of Hurricane Harvey’s rainfall. *Proceedings of the National Academy of Sciences of the United States of America*, 114(12), 12681–12684. <https://doi.org/10.1073/pnas.1716222114>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Eltantawy, R. A. (2016). The role of supply management resilience in attaining ambidexterity: a dynamic capabilities approach. *Journal of Business & Industry Marketing*, 31(1), 123-134. <https://doi.org/10.1108/jbim-05-2014-0091>

- Faivre, N., Sgobbi, A., Happaerts, S., Raynal, J., & Schmidt, L. (2017). Translating the Sendai Framework into action: The EU approach to ecosystem-based disaster risk reduction. *International Journal of Disaster Risk Reduction*, 32, 4–10.  
<https://doi.org/10.1016/j.ijdr.2017.12.015>
- Farooq, M. B., & de Villiers, C. (2017). Telephonic qualitative research interviews: when to consider them and how to do them. *Meditari Accountancy Research; Pretoria*, 25(2), 291–316.  
<https://doi.org/10.1108/medar-10-2016-0083>
- Federal Emergency Management Agency. (2015). *Business infographics*.  
<https://www.fema.gov/media-library/assets/documents/108451>
- Federal Emergency Management Agency. (2011, Winter). Business continuity and disaster preparedness planning. Patterns and findings from current research. *Citizen Preparedness Review* (7). [https://s3-us-gov-west-1.amazonaws.com/dam.production/uploads/20130726-1910-25045-7758/citizen\\_prep\\_review\\_issue\\_7.pdf](https://s3-us-gov-west-1.amazonaws.com/dam.production/uploads/20130726-1910-25045-7758/citizen_prep_review_issue_7.pdf)
- Federal Emergency Management Agency. (2015a). *Effective coordination of recovery resources for state, tribal, territorial and local incidents*.  
<http://www.fema.gov/media-library-data/14236047282331d76a43cabf1209678054c0828bbe8b8/EffectiveCoordinationofRecoveryResourcesGuide020515vFNL.pdf>
- Federal Emergency Management Agency (2015b). *Protecting your businesses*.  
<http://www.fema.gov/protecting-your-businesses>

- Federal Emergency Management Agency. (2017), *Historic disaster response to Hurricane Harvey in Texas*. <http://www.fema.gov/protecting-your-business>
- Fisher, R., Maritz, A. and Lobo, A. (2016). Does individual resilience influence entrepreneurial success? *Academy of Entrepreneurship Journal*, 22(2), 39-53. <https://www.abacademies.org/journals/academy-of-entrepreneurship-journal-home.html>
- Fisher, R., Norman, M., & Klett, M. (2017). Enhancing infrastructure resilience through business continuity planning. *Journal of Business Continuity & Emergency Planning*, 11(2), 163–173. <https://http://www.businesscontinuityjournal.com/>
- Fiksel, J., Polyviou, M., Croxton, K. L., & Pettit, T. J. (2015). From risk to resilience: Learning to deal with disruption. *MIT Sloan Management Review; Cambridge*, 56(2), 79–86. <https://sloanreview.mit.edu>
- Fletcher, L. (2017). The everyday experiences of personal role engagement: What matters most? *Human Resource Development Quarterly*, 28, 451–479. <https://doi.org/10.1002/hrdq.21288>
- Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist*, 18(1), 12–23. <https://doi.org/10.1027/1016-9040/a000124>
- Frank-Miller, E., Covington, M., Despard, M., Hannon, G., & Grinstein-Weiss, M. (2017). *Employee financial wellness programs project: Comprehensive report of findings* (Center for Social Development Research Report No. 71-31). <https://doi.org/10.7936/K7S46RFZ>

Fredrickson, B. L., Tugade, M. M., Waugh, C. E. & Larkin, G. (2003). What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, 84(2), 365-376.

<https://doi.org/10.1037//1089-2680.2.3.300>

Forester, J. (1989). *Planning in the face of power*. California University Press.

Funabashi, Y., & Kitazawa, K. (2012). Fukushima in review: A complex disaster, a disastrous response. *Bulletin of the Atomic Scientists*, 68(2), 9–21.

<https://doi.org/10.1177/0096340212440359>

Fusch, P., & Ness, L. (2015). Are we there yet? Data saturation in qualitative research.

*Qualitative Report*, 20(9), 1408-1416. <http://tqr.nova.edu>

Gale, E. L., & Saunders, M. A. (2013). The 2011 Thailand flood: Climate causes and return periods. *Weather*, 68(9), 233-237. <https://doi.org/10.1002/wea.2133>

Garcia, J. C., & Gluesing, J. C. (2013). Qualitative research methods in international organizational change research. *Journal of Organizational Change Management*, 26, 423-444. <https://doi.org/10.1108/09534811311328416>

Garg, S., & Garg, S. (2017). Rethinking public-private partnerships: An unbundling approach. *Transportation Research Procedia*, 25, 3789–807.

<https://doi.org/10.1016/j.trpro.2017.05.241>

Gaus, N. (2017). Selecting research approaches and research designs: A reflective essay.

*Qualitative Research Journal; Armidale*, 17(2), 99–112.

<https://doi.org/10.1108/qrj-07-2016-0041>

- Gaya, H. J., & Smith, E. E. (2016). Developing a single qualitative case study in the strategic management realm: An appropriated research design? *International Journal of Business Management and Economic Research*, 7(2), 529-538.  
<http://www.ijbmer.com>
- Genet, J. J., & Siemer, M. (2011). Flexible control in processing affective and non-affective material predicts individual differences in trait resilience. *Cognition and Emotion*, 25(2), 380-388. <https://doi.org/10.1080/02699931.2010.491647>
- Grant, C., & Osanloo, A. (2014). Understanding, selecting and integrating a theoretical framework in dissertation research: Creating the blueprint for your “house.” *Administrative Issues Journal*, 4(2), Article 4. <https://dc.swosu.edu/aij>
- Green, S. B., & Salkind, N. J. (2017). *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (8th ed.). Pearson.
- Hadi, M. A., & José Closs, S. (2016). Ensuring rigour and trustworthiness of qualitative research in clinical pharmacy. *International Journal of Clinical Pharmacy; Dordrecht*, 38(3), 641–646. <https://doi.org/10.1007/s11096-015-0237-6>
- Hagarman, A., & Wutich, A. (2017). How many interviews are enough to identify metatheses in multisited and cross-cultural research: Another perspective on Guest, Bunce, and Johnsons' (2006) landmark study. *Field Methods*, 29,1, 23-41.  
<https://doi.org/10.1177/1525822x16640447>
- Haji, J. (2016). Airline business continuity and IT disaster recovery sites. *Journal of Business Continuity & Emergency Planning*, 9(3), 228–238.  
<https://www.henrystewartpublications.com/jbcep>

- Halkos, G., Skouloudis, A., Malesios, C., & Evangelinos, K. (2018). Bouncing back from extreme weather events: Some preliminary findings on resilience barriers facing small and medium-sized enterprises. *Business Strategy and the Environment*, 27(4), 547–559. <https://doi.org/10.1002/bse.2019>
- Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: When to use them and how to judge them. *Human Reproduction*, 31, 498-501. <https://doi.org/10.1093/humrep/dev334>
- Han, Y. (2015). Cloud storage for digital preservation: optimal uses of Amazon S3 and Glacier. *Library Hi Tech*, 33(2), 261-271. <https://doi.org/10.1108/1ht-12-2014-0118>
- Haraguchi, M., & Lall, U. (2015). Flood risks and impacts: A case study of Thailand's floods in 2011 and research questions for supply chain decision making. *International Journal of Disaster Risk reduction*, 14, 256-272. <https://doi.org/10.1016/j.ijdrr.2014.09.005>
- Harrison, C. G., & Williams, P. R. (2016). A systems approach to natural disaster resilience. *Simulation Modelling Practice and Theory*, 65, 11–31. <https://doi.org/10.1016/j.simpat.2016.02.008>
- Harvey, L. (2015). Beyond member checking: A dialogic approach to the research interview. *International Journal of Research & Method in Education*, 38, 23-38. <https://doi.org/10.1080/1743727X.2014.914487>
- Hatamleh, M. T., Hiyassat, M., Sweis, G. J., & Sweis, R. J. (2018). Factors affecting the accuracy of cost estimate: Case of Jordan. *Engineering Construction &*

*Architectural Management*, 25, 113-131. <https://doi.org/10.1108/ECAM-10-2016-0232>

Hatton, T., Grimshaw, E., Vargo, J., & Seville, E. (2016). Lessons from disaster: Creating a business continuity plan that really works. *Journal of Business Continuity & Emergency Planning*, 10, 84–92.

<https://http://www.businesscontinuityjournal.com/>

Hatton, T., Seville, E., & Vargo, J. (Eds). (2012). *Improving the resilience of New Zealand SMEs: Policy and practice in New Zealand* (Resilient Organisations Research Report 2012/012). <https://www.resorgs.org.nz/wp-content/uploads/2017/07/apec-sme-resilience-policy-final-report.pdf> .

Haydn, T. (2019). Triangulation in history education research, and its limitations: A view from the UK. *History Education Research Journal*, 16(1), 35-49.

<https://doi.org/10.18546/HERJ.16.1.04>

Hays, D. G., Wood, C., Dahl, H., & Kirk-Jenkins, A. (2016). Methodological rigor in Journal of Counseling & Development qualitative research articles: A 15-year review. *Journal of Counseling & Development*, 94, 172-183.

<https://doi.org/10.1002/jcad.12074>

Hayes, B., Bonner, A., & Douglas, C. (2013). An introduction to mixed methods research for nephrology nurses. *Renal Society of Australasia Journal*, 9(1), 8-14.

[http://www.renalsociety.org/RSAJ/index\\_nl.html](http://www.renalsociety.org/RSAJ/index_nl.html)

Healey, P. (1997). *Collaborative planning, shaping places in fragmented societies*. Macmillan.

- Hennink, M. M., Hutter, I., & Bailey, A. (2015). *Qualitative research methods*. Sage.
- Hesso, I., Kayyali, R., & Nabhani-Gebara, S. (2019). Supporting respiratory patients in primary care: A qualitative insight from independent community pharmacists in London. *BMC Health Services Research; London, 19*.  
<https://doi.org/10.1186/s12913-018-3814-2>
- Hewlett, D., & Brown, L. (2018). Planning for tranquil spaces in rural destinations through mixed methods research. *Tourism Management, 67*, 237–247.  
<https://doi.org/10.1016/j.tourman.2018.01.011>
- Hoffart, J., & Scheibehenne, B. (2019). Pill or bill? Influence of monetary incentives on the Perceived riskiness and the ethical approval of clinical trials. *Judgment and Decision Making; Tallahassee, 14*(2), 130–134. <http://journal.sjdm.org/>
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1–23.  
<https://doi.org/10.1146/annurev.es.04.110173.000245>
- Holling, C. S. (1996). Engineering resilience versus ecological resilience. In: Schulze, P.C. (Ed.), *Engineering within Ecological Constraints*. National Academy Press.
- Holling, C. S. (2001). Understanding the complexity of economic, ecological, and social systems. *Ecosystem, 4*, 390-405. <https://doi.org/10.1007/s10021-001-0101-5>
- Holloway, I., & Wheeler, S. (2013). *Qualitative research in nursing and healthcare*. Wiley-Blackwell.
- Howarth, A. R., Day, S., Greene, L., & Ward, H. (2017). They made me feel comfortable: A comparison of methods to measure patient experience in a sexual

health clinic. *BMC Health Services Research; London, 17*Article 325.

<https://doi.org/10.1186/s12913-017-2264-6>

Hughes, J., & McDonagh, J. (2017). In defense of the case study methodology for research into strategy practice. *Irish Journal of Management; Dublin, 36*(2), 129–145. <https://doi.org/10.1515/ijm-2017-0013>

Hutter, G. (2016). Collaborative governance and rare floods in urban regions: Dealing with uncertainty and surprise. *Environmental Science & Policy, 55*, 302–308.

<https://doi.org/10.1016/j.envsci.2015.07.028>

Inland Revenue Department. (2012) *Exploring the impact of adverse events on SME tax compliance behaviour: A longitudinal study*. New Zealand Government.

Inman, J. J., Campbell, M. C., Kirmani, A., & Price, L. L. (2018). Our vision for the *Journal of Consumer Research: It's all about the consumer*. *Journal of Consumer Research, 44*, 955–959. <https://doi.org/10.1093/jcr/ucx123>

Ishak, A. W., & Williams, E. A. (2018). A dynamic model of organizational resilience: Adaptive and anchored approaches. *Corporate Communications: An International Journal, 23*, 180–196. <https://doi.org/10.1108/CCIJ-04-2017-0037>

Jacka, J. M. (2017). Resilience through crisis. *Internal Auditor, (2)*, 26.

<https://iaonline.theiia.org>

Jordan, K. (2018). Validity, reliability, and the case for participant-centered research: Reflections on a multi-platform social media study. *International Journal of Human-Computer Interaction, 34*, 913–921.

<https://doi.org/10.1080/10447318.2018.1471570>

- Josephson, A., Schrank, H., & Marshall, M. (2017). Assessing preparedness of small businesses for hurricane disasters: Analysis of predisaster owner, business and location characteristics. *International Journal of Disaster Risk Reduction*, 23, 25–35. <https://doi.org/10.1016/j.ijdr.2017.03.013>
- Kahan, J. H. (2015). Hedging against terrorism: Are US businesses prepared? *Journal of Business Continuity & Emergency Planning*, 9(1), 70–83. <https://www.henrystewartpublications.com/jbcep>
- Kamalahmadi, M., & Parast, M. M., 2016. A review of the literature on the principles of enterprise and supply chain resilience: major findings and directions for future research. *International Journal of Production Economics* 171, 116–133. <https://doi.org/10.1016/j.ijpe.2015.10.023>
- Kandel, N. (2015). Is there a business continuity plan for emergencies like an Ebola outbreak or other pandemics? *Journal of Business Continuity & Emergency Planning*, 8(4), 295–298. Retrieved from <http://www.businesscontinuityjournal.com/>.
- Kapucu, N., Arslan, T., & Collins, M. L. (2010). Examining intergovernmental and interorganizational response to catastrophic disasters: Toward a network-centered approach. *Administration & Society*, 42(2), 222–247. <https://doi.org/10.1177/0095399710362517>
- Kato, M., & Charoenrat, T. (2018). Business continuity management of small and medium sized enterprises: Evidence from Thailand. *International Journal of Disaster Risk Reduction*, 27, 577–587. <https://doi.org/10.1016/j.ijdr.2017.10.002>

- Khan, M. N., Akhtar, P., & Merali, Y. (2018). Strategies and effective decision-making against terrorism affecting supply chain risk management and security: A novel combination of triangulated methods. *Industrial Management & Data Systems*, 118(7), 1528–1546. <https://doi.org/10.1108/IMDS-09-2017-0449>
- Khan, M. A. U., & Sayem, M. A. (2013). Understanding recovery of small enterprises from natural disaster. *Environmental Hazards*, 12, 218–239. <https://doi.org/10.1080/17477891.2012.761593>
- Kingswood, M. (2015). Climate change will require more agile business continuity planning. *Network Security*, 2015(7), 5–10. [https://doi.org/10.1016/S1353-4858\(15\)30057-X](https://doi.org/10.1016/S1353-4858(15)30057-X)
- Klotzbach, P. J., Bowen, S. G., Pielke, R., & Bell, M. (2018). Continental U.S. hurricane landfall frequency and associated damage: Observations and future risks. *Bulletin of the American Meteorological Society*, 99(7), 1359–1376. <https://doi.org/10.1175/BAMS-D-17-0184.1>
- Kirkwood, A., & Price, L. (2013). Examining some assumptions and limitations of research on the effects of emerging technologies for teaching and learning in higher education. *British Journal of Educational Technology*, 44(4), 536-543. <https://doi.org/10.1111/bjet.12049>
- Knutson, T. R., McBride, J. L., Chan, J., Emanuel, K., Holland, G., Landsea, C., Held, I., Kossin, J. P., Srivastava, A. K., Sugi, M. (2010). Tropical cyclones and climate change. *Nature Geoscience*, 3, 157–163. <https://doi.org/10.1038/ngeo779>

- Koonin, L. M. (2020). Novel coronavirus disease (COVID-19) outbreak: Now is the time to refresh pandemic plans. *Journal of Business Continuity & Emergency Planning*, 13(4), 298–312. <http://www.businesscontinuityjournal.com/>
- Koronis, E., & Ponis, S. (2018). Better than before: The resilient organization in crisis mode. *Journal of Business Strategy; Boston*, 39(1), 32–42. <https://www.emeraldinsight.com/journal/jbs>
- Korber, S., & McNaughton, R. B. (2018). Resilience and entrepreneurship: A systematic literature review. *International Journal of Entrepreneurial Behavior & Research*, 24(7), 1129-1154. <https://doi.org/10.1108/ijebr-10-2016-0356>
- Korstjens, I., & Moser, A. (2018) Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124. <https://doi.org/10.1080/13814788.2017.1375092>
- Krichanchai, S., & MacCarthy, B. L. (2017). The adoption of vendor managed inventory for hospital pharmaceutical supply. *International Journal of Logistics Management*, 28(3), 755–780. <https://doi.org/10.1108/IJLM-01-2015-0010>
- Kratz, J. E., & Strasser, C. (2015). Researcher perspectives on publication and peer review of data. *PLoS ONE*, 10(2), e0117619. <https://doi.org/10.1371/journal.pone.0117619>
- Kumar, A., & Mahapatro, M. (2018). Community based qualitative health research: Negotiating ethics in India. *Quality and Quantity; Dordrecht*, 52(3), 1437–1446. <https://doi.org/10.1007/s11135-017-0548-x>

- Kumar, A., & Paddison, R. (2000). Trust and collaborative theory: The case of the Scottish planning system. *International Planning Studies*, 5(2), 205-223.  
<https://doi.org/10.1080/13563470050020194>
- Lama, P. D., & Becker, P. (2019). Conflicts in adaptation: Case studies from Nepal and the Maldives. *Disaster Prevention and Management: An International Journal*, 28(3), 304–318. <https://doi.org/10.1108/DPM-12-2018-0393>
- Lee, D. and Pierson, D. (2011, 6 April). *Disaster in Japan exposes supply chain flaw*. Los Angeles Times, 17.
- Lee, S., Park, J.-G., & Lee, J. (2015). Explaining knowledge sharing with social capital theory in information systems development projects. *Industrial Management & Data Systems; Wembley*, 115(5), 883–900. <https://doi.org/10.1108/IMDS-01-2015-0017>
- Lengnick-Hall, C. A., & Beck, T.E. (2005). Adaptive fit versus robust transformation: How organizations respond to environmental change. *Journal of Management*, 31(5), 738-757. <https://doi.org/10.1177/0149206305279367>
- Lengnick-Hall, C.A., Beck, T.E. & Lengnick-Hall, M.L. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, 21(3), 243-255.  
<https://doi.org/10.1016/j.hrmr.2010.07.001>
- Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, 4, 324-327.  
<https://doi.org/10.4103/22494863.161306>

- Lewis, K. V. (2017). Making meaning as well as money: The experience of young female entrepreneurs. *International Journal of Gender and Entrepreneurship*, 9(4), 377-391. <https://doi.org/10.1108/IJGE-10-2017-0064>
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Sage
- Linnenluecke, M. K. (2015). Resilience in business and management research: a review of influential publications and a research agenda. *International Journal of Management Reviews*, 28(4). <https://doi.org/10.1111/ijmr.12076>
- Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4–30. <https://doi.org/10.1111/ijmr.12076>
- Linnenluecke, M. K., & McKnight, B. (2017). Community resilience to natural disasters: the role of disaster entrepreneurship. *Journal of Enterprising Communities: People and Places in the Global Economy*, 11(1), 166–185. <https://doi.org/10.1108/JEC-01-2015-0005>
- Long, J., Yuan, J. M., & Johnson, R. K. (2018). A shared decision-making tool to prevent substance abuse: Protocol for a randomized controlled trial. *JMIR Research Protocols*, 7. <https://doi.org/10.2196/resprot.7650>
- Low, B., & Johnston, W. J. (2010). Organizational network legitimacy and its impact on knowledge networks: The case of china's td-scdma mobility technology. *The Journal of Business & Industrial Marketing*, 25(6), 468-477. <https://doi.org/10.1108/08858621011066053>

- Lozupone, V. (2017). Disaster recovery plan for medical records company. *International Journal of Information Management*, 37(6), 622–626.  
<https://doi.org/10.1016/j.ijinfomgt.2017.05.015>
- Lub, V. (2015). Validity in qualitative evaluation: Linking purposes, paradigms, and perspectives. *International Journal of Qualitative Methods*, 14, 1-8.  
<https://doi.org/10.1177/1609406915621406>
- Luthar, S. S., Cicchetti, D., & Becker, B.E. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, 71(3), 543 -562.  
<https://doi.org/10.1111/1467-8624.00164>
- Luthar, S. S. (2015). Resilience in development: A synthesis of research across five decades. *Developmental Psychopathology*, 739 -795.  
<https://doi.org/10.1002/9780470939406.ch20>
- Ma, P., Lund, M. S., Nielsen, U. S., Aamand, G. P., & Su, G. (2015). Single-step genomic model improved reliability and reduced the bias of genomic predictions in Danish Jersey. *Journal of Dairy Science*, 98, 9026-9034.  
<https://doi.org/10.3168/jds.2015-9703>.
- McCrae, N., Blackstock, M., & Purssell, E. (2015). Review: Eligibility criteria in systematic reviews: A methodological review. *International Journal of Nursing Studies*, 52, 1269–1276. <https://doi.org/10.1016/j.ijnurstu.2015.02.002>
- McCusker, K., & Gunaydin, S. (2015). Research using qualitative, quantitative, or mixed methods and choice based on the research. *Perfusion*, 30, 537-542.  
<https://doi.org/10.1177/0267659114559116>

- McEntire, D. A. (2007). *Local emergency management organizations*. In Rodríguez, H., Quarantelli, E.L. & Dynes, R.R. (Eds), *Handbook of disaster research*. Springer.
- McInnis-Bowers, C., Parris, D. L., & Galperin, B. L. (2017). Which came first, the chicken or the egg? Exploring the relationship between entrepreneurship and resilience among the Boruca Indians of Costa Rica. *Journal of Enterprising Communities: People and Places in the Global Economy*, 11(1), 39–60.  
<https://doi.org/10.1108/JEC-01-2015-0014>
- McIntyre, D. H., & Hancock, W. I. (Eds). (2013). *Business continuity and homeland security: Vol 1. Business continuity and enterprise value*.  
<https://doi.org/10.4337/9781781001097>
- McNaughton, R. B., & Gray, B. (2017). Entrepreneurship and resilient communities: Introduction to the special issue. *Journal of Enterprising Communities: People and Places in the Global Economy*, 11(1), 2–19. <https://doi.org/10.1108/JEC-01-2016-0002>
- Madikizela-Madiya, N. (2017). Ethics' power dynamics in higher education's self-ethnographic research. *Qualitative Research Journal*, 17(1), 32–42.  
<https://doi.org/10.1108/QRJ-06-2016-0038>
- Makrakis, V., & Kostoulas-Makrakis, N. (2016). Bridging the qualitative–quantitative divide: Experiences from conducting a mixed methods evaluation in the RUCAS programme. *Evaluation and Program Planning*, 54, 144. 151.  
<https://doi.org/10.1016/j.evalprogplan.2015.07.008>

- Martinelli, E., Tagliazucchi, G., & Marchi, G. (2018). The resilient retail entrepreneur: dynamic capabilities for facing natural disasters. *International Journal of Entrepreneurial Behavior & Research*, 24(7), 1222–1243.  
<https://doi.org/10.1108/IJEER-11-2016-0386>
- Masten, A. S. (2014), *Ordinary magic: Resilience in development*. Guilford Press.
- Mathu, K. (2017). Cleaning South Africa's coal supply chain. *The Journal of Business Diversity; West Palm Beach*, 17(3), 116–126.  
<http://www.na-businesspress.com>
- Matin, N., Forrester, J., & Ensor, J. (2018). What is equitable resilience? *World Development*, 109, 197–205. <https://doi.org/10.1016/j.worlddev.2018.04.020>
- Mamman, A., Bawole, J., Agbebi, M., & Alhassan, A.-R. (2018). SME policy formulation and implementation in Africa: Unpacking assumptions as opportunity for research direction. *Journal of Business Research*, 97, 304–315.  
<https://doi.org/10.1016/j.jbusres.2018.01.044>
- Manfield, R. C., & Newey, L. R. (2017). Resilience as an entrepreneurial capability: Integrating insights from a cross-disciplinary comparison. *International Journal of Entrepreneurial Behavior & Research*, 24(7), 1155–1180.  
<https://doi.org/10.1108/IJEER-11-2016-0368>
- Manyena, S. B. (2006). The concept of resilience revisited. *Disasters*, 30(4), 434-450.  
<https://doi.org/10.1111/j.0361-3666.2006.00331.x>
- Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research* (6th ed.). Sage.

- Marshall, M., Niehm, L., Sydnor, S., & Schrank, H. (2015). Predicting small business demise after a natural disaster: An analysis of pre-existing conditions. *Natural Hazards*, 79(1), 331–354. <https://doi.org/10.1007/s11069-015-1845-0>
- Maxfield, R. J., & Russell, E. J. (2017). Emergency services leadership: The lived experience. *Journal of Homeland Security Education*, 6, 1–13.  
<https://www.journalhse.org>
- Maxwell, J. A. (2016). Expanding the history and range of mixed methods research. *Journal of Mixed Methods Research*, 10, 12–27.  
<https://doi.org/10.1177/1558689815571132>
- Me, A. (2017). Empirical analysis of retail customers' adoption of internet banking services in Nigeria. *Journal of Internet Banking and Commerce*, 22(1), 1–17.  
<http://www.arraydev.com/commerce/jibc/>
- Mehmedbegovic, D., & Bak, T. H. (2017). Towards an interdisciplinary lifetime approach to multilingualism: From implicit assumptions to current evidence. *European Journal of language Policy*, 9(2), 149-167.  
<https://doi.org/10.3828/ejlp.2017.10>
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
- Meyer, A. D. (1982). Adapting to environmental jolts. *Administrative Science Quarterly*, 27(4), 515–537. <https://doi.org/10.2307/2392528>
- Miles, M. B. and Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage.

- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Sage.
- Miller, D. S., & Rivera, J.D. (2011). Guiding principles: Rebuilding trust in government and public policy in the aftermath of Hurricane Katrina. *Journal of Critical Incident Analysis, Fall*, 22-32. <https://jcia.aciaji.org>
- Miller, D. S. (2016). Public trust in the aftermath of natural and na-technological disasters: Hurricane Katrina and the Fukushima Daiichi nuclear incident. *International Journal of Sociology and Social Policy*, 36(5/6), 410–431. <https://doi.org/10.1108/IJSSP-02-2015-0030>
- Möller, C., Wang, J., & Nguyen, H. T. (2018). #Strongerthanwinston: Tourism and crisis communication through Facebook following tropical cyclones in Fiji. *Tourism Management*, 69, 272–284. <https://doi.org/10.1016/j.tourman.2018.05.014>
- Monllor, J., Pavez, I., & Pareti, S. (2020). Understanding informal volunteer behavior for fast and resilient disaster recovery: An application of entrepreneurial effectuation theory. *Disaster Prevention and Management: An International Journal*, 29(4), 575–589. <https://doi.org: 10.1108/DPM-05-2019-0151>
- Motaung, L. L., Bussin, M. H., & Joseph, R. M. (2017). Maternity and paternity leave and career progression of black African women in dual-career couples. *SA Journal of Human Resource Management; Tygervalley*, 15. <https://doi.org/10.4102/sajhrm. v15i0.902>

- Morton, A., Rivers, C., Charters, S., & Spinks, W. (2013). Champagne purchasing: The influence of kudos and sentimentality. *Qualitative Market Research, 16*(2), 150-164. <https://doi.org/10.1108/13522751311317567>
- Morse, J. M. (2015). Data were saturated. *Qualitative Health Research, 25*(5), 587-588. <https://doi.org/10.1177/1049732315576699>
- Moylan, C. A., Derr, A. S., & Lindhorst, T. (2015). Increasingly mobile: How new technologies can enhance qualitative research. *Qualitative Social Work Research and Practice, 14*(1), 36-47. <https://doi.org/10.1177/1473325013516988>
- Muleya, V. R., Fourie, L., & Schlebusch, S. (2017). Ethical challenges in assessment centres in South Africa. *SA Journal of Industrial Psychology; Auckland Park, 43*. <https://doi.org/10.4102/sajip.v43i0.1324>
- Myers, M. D. (2015). *Qualitative research in business and management*. Sage.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*(2), 242-266. <https://doi.org/10.1016/b978-0-7506-7222-1.50009-x>
- Nassauer, A., & Legewie, N. M. (2019). Analyzing 21<sup>st</sup> century video data on situational dynamics-issues and challenges in video data analysis. *Social Sciences, 8*, 100. <https://doi.org/10.3390/socsci8030100>
- Nath, D. (2000). Gently shattering the glass ceiling: Experiences of Indian women managers. *Women in Management Review, 15*(1), 44-52. <https://doi.org/10.1108/0964942001031019>

- National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1979). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research*. Washington, DC: U.S. Department of Health and Human Services.
- National Oceanic and Atmospheric Administration. (2017), *Saffir-Simpson Hurricane Wind Scale*. Author.
- Natow, R. S. (2019). The use of triangulation in qualitative studies employing elite interviews. *Qualitative Research*, 1-4. <https://doi.org/10.1177/1468794119830077>
- Nebeker, C., Linares-Orozco, R., & Crist, K. (2015). A multi-case study of research using mobile imaging, sensing and tracking technologies to objectively measure behavior: Ethical issues and insights to guide responsible research practice. *Journal of Research Administration; Washington*, 46(1), 118–137.  
<https://www.srainternational.org/home>
- Nguyen, T. Q. T. (2015). Conducting semi-structured interviews with the Vietnamese. *Qualitative Research Journal: Armidale*, 15(1), 35–46.  
<https://doi.org/10.1108/qrij-04-2014-0012>
- Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-Based Nursing*, 18, 2, 2-3. <https://doi.org/10.1136/eb-2015-102054>
- O’Connell, R. (2013). The use of visual methods with children in a mixed methods study of family food practices. *International Journal of Social Research Methodology*, 16, 31-46. <https://doi.org/10.1080/13645579.2011.647517>

- Odhiambo, W. A., Guthua, S. W., Macigo, F. G., & Akama, M. K. (2002). Maxillofacial injuries caused by terrorist bomb attack in Nairobi, Kenya. *International Journal of Oral and Maxillofacial Surgery*, *31*(4), 374–377.  
<https://doi.org/10.1054/ijom.2001.0199>
- Olsson, L., Jerneck, A., Thoren, H., Persson, J., & O’Byrne, D. (2015). Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Science Advances*.  
<https://doi.org/10.1126/sciadv.1400217>
- O’Reilly, M., & Parker, N. (2013). Unsatisfactory saturation: A critical exploration of the notion of saturated sample sizes in qualitative research. *Qualitative Research*, *13*(2), 190-197. <https://doi.org/10.1177/146879411244610>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposive sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health*, *42*, 533-544. <https://doi.org/10.1007/s10488-013-0528-y>
- Panpakdee, C., & Limmirankul, B. (2018). Indicators for assessing social-ecological resilience: A case study of organic rice production in northern Thailand. *Kasetsart Journal of Social Sciences*, *39*(3), 414–421.  
<https://doi.org/10.1016/j.kjss.2017.07.003>
- Park, J., & Park, M. (2016). Qualitative versus quantitative research methods: Discovery or justification? *Journal of Marketing Thought*, *3*(1), 1-7.  
<https://doi.org/10.15577/jmt.2016.03.01.1>

- Patton, M. Q. (2015). *Qualitative research & evaluation methods*. Sage.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Sage
- Ponis, S. T., & Koronis, E. (2012). Supply chain resilience: Definition of concept and its formative elements. *Journal of Applied Business Research*, 28(5), 921.  
<https://doi.org/10.19030/jabr.v28i5.7234>
- Purpura, P. P. (2019). Terrorism and homeland security. In P. P. Purpura (Ed.), *Security and Loss Prevention* (7th ed) (pp. 459–511). <https://doi.org/10.1016/B978-0-12-811795-8.00015-1>
- Radvanovsky, R., & McDougall, A. (2013). *Critical infrastructure: Homeland security and emergency preparedness* (3rd ed.). Taylor & Francis.  
<https://doi.org/10.4324/9781315164687-6>.
- Randolph, S. A. (2015). Emergency preparedness plan. *Workplace Health & Safety*, 63(7), 324. <https://doi.org/10.1177/2165079915591397>
- Revilla, E., & Saenz, M. J. (2017). The impact of risk management on the frequency of supply chain disruptions. *International Journal of Operations & Production Management*, 37(5), 557-576. <https://doi.org/10.1108/IJOPM-03-2016-0129>
- Ready.gov. (2012). *Business continuity plan test: Exercise planner instructions*.  
<http://ready.gov>
- Reilly, R. C. (2013). Found poems, member checking and crises of representation. *Qualitative Report*, 18(30), 1–18. <http://tqr.nova.edu/>
- Ridder, H.-G. (2017). The theory contribution of case study research designs. *Business Research*, 10(2), 281–305. <https://doi.org/10.1007/s40685-017-0045-z>

- Rodriguez, L. (2018). Methodological challenges of sensitive topic research with adolescents. *Qualitative Research Journal: Armidale*, 18(1), 22–32.  
<https://doi.org/10.1108/qrj-d-17-00002>
- Runfola, A., Perna, A., Baraldi, E., & Gregori, G. L. (2017). The use of qualitative case studies in top business and management journals: A quantitative analysis of recent patterns. *European Management Journal*, 35(1), 116–127.  
<https://doi.org/10.1016/j.emj.2016.04.001>
- Sahebjamnia, N., Torabi, S. A., & Mansouri, S. A. (2018). Building organizational resilience in the face of multiple disruptions. *International Journal of Production Economics*, 197, 63–83. <https://doi.org/10.1016/j.ijpe.2017.12.009>
- Sahebjamnia, N., Torabi, S. A., & Mansouri, S. A. (2015). Integrated business continuity and disaster recovery planning: Towards organizational resilience. *European Journal of Operational Research*, 242(1), 261-273. <https://doi.org/10.1016/j.ejor.2014.09.055>
- Sakurai, M., Watson, R., Abraham, C., & Kokuryo, J. (2014). Sustaining life during the early stages of disaster relief with a frugal information system: Learning from the great east Japan earthquake. *IEEE Communications Magazine*, 52(1), 176–185.  
<https://doi.org/10.1109/MCOM.2014.6710081>
- Samkin, G., Pitu, E., & Low, M. (2014). Identifying the financial literacy skills necessary to run a small New Zealand Business. *E-Journal of Business Education and Scholarship of Teaching*, 8(1), 44–66. <http://www.ejbest.org>

- Samuel, P., Quinn Griffin, M. T., White, M., & Fitzpatrick, J. J. (2015). Crisis leadership efficacy of nurse practitioners. *Journal for Nurse Practitioners*, *11*, 862–868.  
<https://doi.org/10.1016/j.nurpra.2015.06.010>
- Sandler, T., & Enders, W. (2008). Economic Consequences of terrorism in developed and developing countries: An overview. In P. Keefer & N. Loayza (Eds.), *Terrorism, economic development, and political openness* (pp. 17–47). Cambridge University Press. <https://doi.org/10.1017/CBO9780511754388.002>
- Santiago, J. S. S., Manuela, W. S., Tan, M. L. L., Sañez, S. K. B., & Tong, A. Z. U. (2018). Agency-driven post-disaster recovery: A comparative study of three Typhoon Washi resettlement communities in the Philippines. *International Journal of Disaster Risk Reduction*, *27*, 480–489.  
<https://doi.org/10.1016/j.ijdr.2017.11.012>
- Sarmiento, J. P., Hoberman, G., Ilcheva, M., Asgary, A., Majano, A. M., Poggione, S., & Duran, L. R. (2015). Private sector and disaster risk reduction: The cases of Bogota, Miami, Kingston, San Jose, Santiago, and Vancouver. *International Journal of Disaster Risk Reduction*, *14*(3), 225–237.  
<https://doi.org/10.1016/j.ijdr.2014.09.008>
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015). *Research methods for business students* (7th ed.). Pearson.
- Seitz, S. (2015). Pixilated partnerships, overcoming obstacles in qualitative interviews via Skype: A research note. *Qualitative Research*, 1–7.  
<https://doi.org/10.1177/1468794115577011>

- Seppänen, H., Luukkala, P., Zhang, Z., Torkki, P., & Virrantaus, K. (2018). Critical infrastructure vulnerability: A method for identifying the infrastructure service failure interdependencies. *International Journal of Critical Infrastructure Protection*, 22, 25–38. <https://doi.org/10.1016/j.ijcip.2018.05.002>
- Setty, S. (2011). What's in a name? How nations define terrorism ten years after 9/11. *University of Pennsylvania Journal of International Law*, 33(1), 1-64. <https://www.law.upenn.edu/live/files/139-setty33upajintl112011pdf>
- Seville, E., Opstal, V. D., & Vargo, J. (2015). A primer in resiliency: Seven principles for managing the unexpected. *Global Business and Organizational Excellence*, 34(3), 6 -18. <https://doi.org/10.1002/joe.21600>
- Schramm, W. (1971, December). *Notes on case studies of instructional media projects* [Working paper]. The Academy for Educational Development, Washington, DC.
- Seligman, M. E. P. (2011). Building resilience. *Harvard Business Review*, 89(4), 100-106. <https://www.hbr.org>
- Shreve, C. M., & Kelman, I. (2014). Does mitigation save? Reviewing cost-benefit analyses of disaster risk reduction. *International Journal of Disaster Risk Reduction*, 10, 213–235. <https://doi.org/10.1016/j.ijdrr.2014.08.004>
- Siegel, M. (2018). Building resilient organisations: Proactive risk management in organisations and their supply chains. *Journal of Business Continuity & Emergency Planning*, 11(4), 373–384. <https://www.henrystewartpublications.com/jbcep>

- Siew Khoon Khoo, Y., & Saleh, K. (2017). A qualitative study among potential manufacturers on the development of 'made in Malaysia' biological products: Challenges and proposed solutions. *Journal of Commercial Biotechnology*, 23, 44-61. <https://doi.org/10.5912/jcb814>
- Sikweyiya, Y., & Jewkes, R. (2013). Potential motivations for and perceived risks in research participation: Ethics in health research. *Qualitative Health Research*, 23(7), 999-1009. <https://doi.org/10.1177/1049732313490076>
- Singh, A. S. (2014). Conducting case study research in non-profit organizations. *Qualitative Market Research: An International Journal*, 17(1), 77-84. <https://doi.org/10.1108/QMR-04-2013-0024>
- Singh, S. (2015). Hello, limitations! The paradoxical power of limits in scientific writing. *Indian Journal of Dermatology, Venereology, and Leprology*, 81(1), 4–6. <https://doi.org/10.4103/0378-6323.148555>
- Singh, S., Corner, P. D., & Pavlovich, K. (2015). Failed, not finished: A narrative approach to understanding venture failure stigmatization. *Journal of Business Venturing*, 30(1), 150-166. <https://doi.org/10.1016/j.jbusvent.2014.07.005>
- Skipper, J. B., Hanna, J. B., & Gibson, B. J. (2010). Alabama power response to Katrina: Managing a severe service supply chain disruption. *Journal of the International Academy for Case Studies*, 16(2), 15–21. <https://www.abacademies.org/journals/journal-of-the-international-academy-for-case-studies-home.html>

- Smith, R., & McElwee, G. (2015). Developing qualitative research streams relating to illegal rural enterprise. *International Journal of Entrepreneurial Behavior & Research*, 21, 364-388. <https://doi.org/10.1108/IJEER-01-2014-0019>
- Smith, B., & McGannon, K. (2017). Developing rigor in qualitative research: problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology*. <https://doi.org/10.1080/1750984X.2017.1317357>
- Sobottka, E. A. (2016). Commitment and regulation. Ethics in research and the human sciences. *International Journal of Action Research; Leverkusen*, 12(2), 116–143. <https://doi.org/10.1688/IJAR-2016-02-Sobottka>
- Sorsa, M. A., Kiikkala, I., & Astedt-Kurki, P. (2015). Bracketing as a skill in conducting unstructured qualitative interviews. *Nurse Researcher*, 22(4), 8-12. <https://doi.org/10.7748/nr.22.4.8. e1317>
- Staw, B. M., Sandelands, L.E. & Dutton. (1981). Threat rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly*, 26(4), 501–524. <https://doi.org/10.2307/2392337>
- Stechemesser, K., Endrikat, J., Grasshoff, N., & Guenther, E. (2015). Insurance companies' responses to climate change: Adaptation, dynamic capabilities and competitive advantage. *Geneva Papers on Risk & Insurance; London*, 40(4), 557–584. <https://doi.org/10.1057/gpp.2015.1>
- Steffen, W., Richardson, K., Rockstrom, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., & Sorlin, S.

(2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223). 736 -746. <https://doi.org/10.1126/science.1259855>

Stein, R. C., Dunn, J. A., Bartlett, J. M., Campbell, A. F., Marshall, A., Hall, P., Rooshenes, L., Morgan, A., Poole, C., Pinder, S. E., Cameron, D. A., Stallard, N., Donovan, J. L., McCabe, C., Hughes-Davies, & Makris, A. (2016). Methods: Recruitment and study of personalized care in the treatment of women with early breast cancer. *Health Technology Assessment*, 20(10), 1 -236.

<https://doi.org/10.3310/hta20100>

Strauss, A., & Corbin, J. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage.

Sullivan, J. (2017). Considering employee needs during a catastrophe requires innovative recovery plans: Why traditional workplace recovery solutions are outdated. *Journal of Business Continuity & Emergency Planning*, 10(3), 259–267.

<http://www.businesscontinuityjournal.com/>

Sutcliffe, K. M., & Vogus, T. 2003. Organizing for resilience. In K. S. Cameron, J. E. Dutton, & R. E. Quinn (Eds.), *Positive organizational scholarship* (pp. 94-110). Berrett-Koehler.

Sydnor, S., Niehm, L., Lee, Y., Marshall, M., & Schrank, H. (2017). Analysis of post-disaster damage and disruptive impacts on the operating status of small businesses after Hurricane Katrina. *Natural Hazards; Dordrecht*, 85(3), 1637–1663.

<https://doi.org/10.1007/s11069-016-2652-y>

- Tavakol, M., & Sandars, J. (2014). Quantitative and qualitative methods in medical education research: Part II. *Medical Teacher*, *36*(10), 838-848.  
<https://doi.org/10.3109/0142159X.2014.915297>
- Teece, D., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509-533.  
[https://doi.org/10.1002/\(sici\)1097-0266\(199708\)18:7%3C509::aid-smj882%3E3.0.co;2-z](https://doi.org/10.1002/(sici)1097-0266(199708)18:7%3C509::aid-smj882%3E3.0.co;2-z)
- Thurman, N. (2018). *Mixed-methods communication research: Combining qualitative and quantitative approaches in the study of online journalism*. Sage.
- Thurnell-Read, T. (2016). Masculinity, age, and rapport in qualitative research. *Gender Identity and Research Relationships*, *14*, 23-41. <https://doi.org/10.1108/S1042-319220160000014014>
- Tingbani, I., Okafor, G., Tauringana, V., & Zalata, A. M. (2018). Terrorism and country-level global business failure. *Journal of Business Research*.  
<https://doi.org/10.1016/j.jbusres.2018.08.037>
- Tipler, K., Tarrant, R., Johnston, D., & Tuffin, K. (2017). Are you ready? Emergency preparedness in New Zealand schools. *International Journal of Disaster Risk Reduction*, *25*, 324–333. <https://doi.org/10.1016/j.ijdrr.2017.09.035>
- Tran, V. T., Porcher, R., Falissard, B., & Ravaud, P. (2016). The point of data saturation was assessed using resampling methods in survey with open-ended questions. *Journal of Clinical Epidemiology*, *80*, 88-96.  
<https://doi.org/10.1016/j.jclinepi.2016.07.014>

- Travelers Insurance (2019a). Is your manufacturing supply chain vulnerable to disruption? <https://www.travelers.com/resources/business-industries/manufacturing/manufacturing-supply-chain-vulnerabilities>
- Travelers Insurance (2019b) Why is business continuity important? <https://www.travelers.com/resources/business-continuity/whyis-business-continuity-important.aspx>.
- Travelers Insurance (2020) Resources/facilities-management/vendor-risk-management-guidelines. <https://www.travelers.com/resources/facilities-management/vendor-risk-management-guidelines>
- Tribunella, H., & Tribunella, T. (2018). 15 questions answered about flood damage: Using insurance and tax deductions to mitigate losses. *CPA Journal; New York*, 88(11), 42–47. <http://www.cpajournal.com/>
- Tsang, E. W. (2014). Generalizing from research findings: The merits of case studies. *International Journal of Management Reviews*, 16, 369-383. <https://doi.org/10.1111/ijmr.12024>
- Tse, Y. K., Matthews, R. L., Tan, K. H., Sato, Y., & Pongpanich, C. (2016). Unlocking supply chain disruption risk within the Thai beverage industry. *Industrial Management & Data Systems*, 116, 21-42. <https://doi.org/10.1108/IMDS-03-2015-0108>
- Tusaie, K., and Dyer, J. (2004). Resilience: A historical review of the construct. *Holistic Nursing Practice: The Science of Health and Healing*, 18(1), 3-8 <https://doi.org/10.1097/00004650-200401000-00002>

- Tuval-Mashiach, R. (2017). Raising the curtain: The importance of transparency in qualitative research. *Qualitative Psychology*, 4(2), 126–138.  
<https://doi.org/10.1037/qup0000062>
- Urciuoli, L. (2015). Cyber-resilience: a strategic approach for supply chain management. *Technology Innovation Management Review*, 5(4), 13-18.  
<https://doi.org/10.22215/timreview/886>
- U.S Congress (1988). *The Robert T. Stafford disaster relief and emergency assistance amendments of 1988*: Publication No. 101-707.102, Stat. 4689, Washington, DC.
- U.S. Department of Homeland Security. (2012a). *Homeland security grant program: Supplemental resource: Support for public-private collaboration*.  
[http://www.fema.gov/pdf/government/grant/2012/fy12\\_hsgp\\_public.pdf](http://www.fema.gov/pdf/government/grant/2012/fy12_hsgp_public.pdf)
- U.S. Department of Homeland Security (2012b). *National strategy for chemical, biological, radiological, nuclear, and explosives (CBRNE) standards*.  
<https://www.dhs.gov/national-strategy-chemical-biological-radiological-nuclear-and-explosives-cbrne-standards>
- U.S. Small Business Administration. (2014a). *Frequently asked questions*.  
[https://www.sba.gov/sites/default/files/FAQ\\_March\\_2014\\_0.pdf](https://www.sba.gov/sites/default/files/FAQ_March_2014_0.pdf)
- U.S. Small Business Administration. (2014b). *Disaster loans*.  
<https://www.sba.gov/category/navigationstructure/loans-grants/small-business-loans/disaster-loans>.
- U.S. Small Business Administration. (2014c). *Disaster planning*. Available at  
<https://www.sba.gov/content/disasterplanning>.

- U.S. Small Business Administration. (2017). *Dallas/Fort Worth small business resources*. [https://www.sba.gov/sites/default/files/files/resourceguide\\_3148.pdf](https://www.sba.gov/sites/default/files/files/resourceguide_3148.pdf)
- Van de Pol, A.-J., & Derksen, J. (2018). The incompatibility of phenomenological data and dominant nosological systems like DSM-5: Binswanger's psychopathological phenomenology. *Journal of Phenomenological Psychology, 49*(2), 164–196. <https://doi.org/10.1163/15691624-12341345>
- Vanderbilt-Adriance, E., & Shaw, D. S. (2008). Conceptualizing and re-evaluating resilience across levels of risk, time and domains of competence. *Clinical Child and Family Psychology Review, 11*(1/2), 30-58. <https://doi.org/10.1007/s10567-008-0031-2>
- Van Der Vegt, G.S., Essens, P., Wahlström, M., & George, G. (2015). Managing risk and resilience. *Academy of Management Journal, 58*(4), 971-980. <http://aom.org/amj/>
- VanDevanter, N., Raveis, V. H., Kovner, C. T., McCollum, M., & Keller, R. (2017). Challenges and resources for nurses participating in a Hurricane Sandy hospital evacuation. *Journal of Nursing Scholarship; Indianapolis, 49*(6), 635–643. <https://doi.org/10.1111/jnu.12329>
- Van Niekerk, D., Raju, E., & Coetzee, C. (2016). Disaster resilience and complex adaptive systems theory: Finding common grounds for risk reduction. *Disaster Prevention and Management: An International Journal, 25*(2), 196–211. <https://doi.org/10.1108/DPM-07-2015-0153>

- van Rijnsoever, F. J. (2017). (I Can't Get No) Saturation: A simulation and guidelines for sample sizes in qualitative research. *PLOS ONE*, *12*(7).  
<https://doi.org/10.1371/journal.pone.0181689>
- Varpio, L., Ajjawi, R., Monrouxe, L. V., O'Brien, B. C., & Rees, C. E. (2017). Shedding the cobra effect: Problematising thematic emergence, triangulation, saturation and member checking. *Medical Education*, *51*(1), 40-50.  
<https://doi.org/10.1111/medu.13124>
- Walby, K., & Luscombe, A. (2016). Criteria for quality in qualitative research and use of freedom of information requests in the social sciences. *Qualitative Research*, *17*(5), 537–553. <https://doi.org/10.1177/1468794116679726>
- Walker, I., & Halvey, M. (2017). On designing an oral history search system. *Journal of Documentation; Bradford*, *73*(6), 1281–1298. <https://doi.org/10.1108/JD-10-2016-0121>
- Walker, B. H., Salt D. A. (2006). *Resilience thinking: Sustaining ecosystems and people in a changing world*. Island Press.
- Walker, B. H., & Salt, D. A. (2012). *Resilience practice: Building capacity to absorb disturbance and maintain function*. Island Press.
- Weichselgartner, J., & Kelman, I. (2015). Geographies of resilience: Challenges and opportunities of a descriptive concept. *Progress in Human Geography*, *39*(3), 249–267. <https://doi.org/10.1177/0309132513518834>
- Whitman, M. E., Mattord, H. J., & Green, A. (2014). *Principles of incident response & disaster recovery* (2nd ed.). Cengage Learning.

- Wijngaarden, V. (2017). Q method and ethnography in tourist research: Enhancing insights, comparability, and reflexivity. *Current Issues in Tourism*, 20(8), 869–882. <https://doi.org/10.1080/13683500.2016.1170771>
- Williams, B. (2015). How to evaluate qualitative research. *American Nurse Today*, 10(11), 31–38. <http://americannursetoday.com>
- Winter, G. (2020). COVID-19 and emergency planning...Reprinted with permission from the British Journal of Healthcare Management: Winter G. COVID-19 and emergency planning. *British Journal of Healthcare Management*. 2020. *British Journal of Community Nursing*, 25(4), 184–186. <https://doi.org/10.12968/bjcn.2020.25.4.184>
- Woods, D. D., Branlat, M., 2011. Basic patterns in how adaptive systems fail. In E. Hollnagel, J. PARIÈS, D. D. Woods, & J. Wrethall, (Eds.), *Resilience engineering in practice - A guidebook*. (pp.127–143). Ashgate.
- World Bank. (2011, December 13). *The World Bank supports Thailand's post-floods recovery effort*. <https://www.worldbank.org/en/news/feature/2011/12/13/world-bank-supports-thailands-post-floods-recovery-effort>
- World Bank. (2012). *Thai flood 2011: Rapid assessment for resilient recovery and reconstruction planning*. <https://openknowledge.worldbank.org/handle/10986/26862>
- World Health Organization. (2020, March 19). *Risk communication and community engagement readiness and response to coronavirus disease (COVID-19): Interim guidance*. <https://apps.who.int/iris/handle/10665/331513>

- Yates, J., & Leggett, T. (2016). Qualitative research: An introduction. *Radiologic Technology*, 88(2), 225-231. <http://www.radiologictechnology.org>
- Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *Qualitative Report*, 20, 134–152. <https://nsuworks.nova.edu/tqr/>
- Yeo, J., & K. Comfort, L. (2017). An expected event, but unprecedented damage: Structure and gaps of large-scale response coordination of the 2011 Thailand floods. *Disaster Prevention and Management: An International Journal*, 26(4), 458–470. <https://doi.org/10.1108/DPM-02-2017-0048>
- Yin, R. K. (2012). *Applications of case study research*. Sage.
- Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage.
- Yin, R. K. (2018). *Case study research: Design and methods* (6th ed.). Sage.
- Zamawe, F. C. (2015). The implication of using NVivo software in qualitative data analysis: Evidence-based reflections. *Malawi Medical Journal*, 27(1), 13-15. <https://doi.org/10.4314/mmj.v27i1.4>
- Zhang, X.-D., Luk, S. C. Y., Han, Y.-H., Chen, G.-R., Zhang, G.-L., Zhu, B.-S., & Luchters, S. (2019). Ethical considerations for conducting sexual and reproductive health research with female adolescents engaged in high-risk behaviours in China. *Sexual & Reproductive Healthcare*, 20, 46–53. <https://doi.org/10.1016/j.srhc.2019.02.005>

## Appendix A: Interview Protocols

### **Opening remark at the start of the Interview**

My name is Charles Ogutu, a student at Walden University pursuing a doctoral degree in Business Administration with a specialization in Homeland Security. Thank you for accepting to participate in this study. I am conducting a qualitative multiple case study titled. *Small Business Owners' Strategies for Preventing and Mitigating Service Disruptions.*

The purpose of this qualitative multiple case study is to explore what business continuity strategies independently owned auto maintenance small business owners use to mitigate natural disaster.

The duration of this interview should be about 30-45 minutes. The interview format is open ended questions.

Please feel free to seek clarity to questions and add more detailed explanations and personal views as you see appropriate.

### **Things to remember**

1. Switch off the mobile phone
2. Check to make sure the participants received an email copy of the written informed consent form. *Did you receive the document? The consent form includes the Walden Institutional Review Board (IRB) number for this study and an email address for the Chair of my Doctoral Study Committee. There is also an e-mail contact for the IRB if you have additional questions beyond this interview about the nature and purpose of this study.*

3. Collect the signed consent form
4. Get approval to record the interview
5. If participant agrees to the audio recording, begin recording.
6. Assure participant that all responses will be confidential: *(Participant's name) all of your responses are confidential, and the published doctoral study will not include any recognizing information to protect your identity.*
7. If the participant decides not to give their permission for an audio recording of the interview: *"Thank you (participant's name), I respect your decision. I need to take written notes of your responses to capture your perceptions about the mentoring program. The interview may require an additional time commitment to ensure I write your responses accurately. Are you still willing to participate?"*
8. 8. Assure the participant that all responses will be confidential: *"(Participant's name) (Participant's name) all of your responses are confidential, and the published doctoral study will not include any recognizing information to protect your identity."*
9. Start interview and take notes with active listening strategy.
10. Observe the participant for non-verbal body language and gestures
11. Elicit detailed responses to the interview questions
12. Not to interrupt the participants and to listen carefully what they are saying

## Appendix B: Interview Questions

### **Interview Questions**

1. What strategies does your organization have in place to ensure business continuity in the event of a disaster.
2. How were strategies to ensure business continuity in the event of a natural disaster communicated within your organization and to the stakeholders?
3. What policies and processes have you used to mitigate natural disaster impact.?
4. How did you address key challenges to implementing your organization's strategies for mitigating natural disaster impact?
5. How did you evaluate the effectiveness of the strategies for mitigating disaster impact in your independently owned auto maintenance business?
6. What information can you share that was not already covered about mitigating natural disaster impact for your organization?.