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Information Technology Disaster Recovery Planning by Florida Nonprofit Organizations

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This is to certify that the doctoral study by

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Walden University
2020

Abstract

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MS, University of Phoenix, 2009

BS, University of Phoenix, 2004

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Inadequate information technology (IT) disaster recovery planning (DRP) by nonprofit organizations could lead to organizational failure post-large-scale natural disasters. Without proper funding and planning, organizations may not be able to withstand the effects of a natural disaster resulting in the closure and the community losing a critical need service. Grounded in resilience theory, the purpose of this qualitative multiple case study was to explore strategies utilized by Florida-based nonprofit organization technology managers to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts. The data collection included interviews with 5 IT managers and reviews of 4 business continuity plans, 5 IT disaster recovery plans, and 1 hurricane specific plan. Inductive analysis was used for coding, triangulation, and the identification of themes. The primary themes include managers are relying on their existing knowledge, more plan testing and training is required, and the critical staff includes everyone. The findings, as presented in this study, indicate that managers are using basic knowledge to create plans; there is a limited amount of testing and training, and organizations need everyone to help with recovery. The implications for positive social change include the potential to identify gaps in overall preparedness, which may pave the way for creating an IT DRP framework specific for nonprofit organizations.

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Dedication

I dedicate this to my wife, Noelle, and our three daughters, Heidi, Regan, and Emma; this endeavor was not possible without your support, pressure, and understanding. You all sacrificed more then you should have; I love you all. To my parents, Linda and Ernie Erfourth, who often told people they were just happy when I graduated high school.; how about this accomplishment. To my mother-in-law, Mary Scholz, and late father-in-law, Edwood Scholz, thank you for all the support you gave me. I know Dad (Ed) is looking down and happily boasting about finally having a Doctor in the family. To my co-workers, Corey Null, Darron Lightbourn, and Steve Moulden, who have listened to me complain the last few years. Who also kept telling me just get this done already. To Graydon McKee, who was more supportive than any manager should be. Your understanding, mentorship, and friendship made this possible. Ruben Ruiz, Michael Maddox, and Steve Ackerman, who lost their fishing buddy when I started this process, now I have time to go fishing. I dedicate this to all of you. Lastly, David Jacobs and Pastor John Covach, who many years ago helped put a struggling kid back on the right path and never gave up on him; I know this will make you proud.

Acknowledgments

I would like to thank my family, friends, and co-workers for their support over the years. I would like to thank my committee chair, Dr. Steven Case; this achievement would not be possible without his support, guidance, and willingness to let me vent. I would like to thank Dr. Jon McKeeby, my second committee member, for providing valuable feedback and guidance. I would like to thank Dr. Jodine Burchell for helping make my study more complete.

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Section 1: Foundation of the Study

In 2004, Florida was impacted by four hurricanes in 6 weeks; all four hurricanes had a significant impact on large sections of the state. The first storm, Hurricane Charlie, caused the most significant amount of damage in the state over the most extensive geographic area, stretching from southwest to northeast Florida. Until 2017's Hurricane Irma, the last major hurricane to impact Florida was Hurricane Wilma in 2005. The disaster recovery planning concept is a result of an event where a large Internet data center provider lost power resulting in an economic impact on their customers. The event is an example of why the disaster recovery plan (DRP) topic is critical. A failure to plan and test for such events will impact a business's ability to remain a going concern post-natural disaster.

Southwest Florida, like many communities, has numerous organizations that provide services to the local community; many of these organizations fail to implement information technology (IT) DRP. The absence of an IT DRP is a significant risk in an area that sees numerous weather-related disasters. In many cases, these organizations will not recover because of lost IT operations; however, the significance of a weather-related event will also affect an organization's ability to recover. A temporary loss of services because of a lightning strike is localized, causing little to no effect on the local community. The loss of operations due to a significant weather-related event, like a hurricane, will have a more significant impact on an organization's ability to recover due to the impact of the event on the larger geographical area.

Problem Statement

Some IT infrastructure is at risk from multiple threats ranging from security, facilities, and natural disasters, all of which will increase over the coming years (Fisher, Norman, & Klett, 2017). Natural occurring threats will test an organization's ability to remain sustainable long after a threat materializes. The Federal Emergency Management Agency (FEMA, 2017) estimated that nearly 40% of all small businesses fail to reopen after a natural disaster. The general IT problem was that many nonprofits fail to prepare for the impacts a natural disaster had on their IT infrastructure. The specific IT problem was that some nonprofit organizations' technology managers lack strategies to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts.

Purpose Statement

The purpose of this qualitative case study was to explore strategies utilized by nonprofit organization technology managers to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts. Technology managers are individuals who plan and direct organizational data processing, information systems, and programming activities (U.S. Bureau of Labor Statistics, 2017). Partner organizations were nonprofit organizations registered with the State of Florida and may receive supplemental income from the government or organizations such as the United Way. These 501(c)3 partners in Florida provided a critical need service to the local community. The Florida-based organizations had a small staff size or third-party vendor who provide IT functions. Lastly, the location of the participating IT managers was in southwest and west central Florida. The findings of the study could allow for the development of an IT DRP natural

disaster-specific framework targeting the nonprofit sector, which may have challenges with technology. Positive social change can occur by providing awareness of the need for nonprofits to adopt a natural disaster-specific IT DRP framework to support sustainability to provide critical services to the community they serve.

Nature of the Study

For this study, I employed a qualitative approach to explore how nonprofits adopt and implement IT DRP for natural disaster scenarios. Qualitative research allows for a full breadth of data gathering methods (Flick, 2015). I used numerous methods for gathering data in this study. Quantitative researchers seek to determine the relationships between variables and are either descriptive or experimental (Barczak, 2015). I did not seek to test a hypothesis or understand the relationship between variables; therefore, a quantitative method was not appropriate for this study. Mixed method research uses both qualitative and quantitative methods to gather and analyze data (Makrakis & Kostoulas-Makrakis, 2016). A mixed-method methodology is appropriate when the researcher needs to combine data gathered using qualitative and quantitative methods. In this study, I did not offer a hypothesis or seek to define the relationship between variables; therefore, both quantitative and mixed-method approaches were not appropriate.

A case study design was selected for this study. Case studies provide insights from a sociological and psychological perspective into current processes and procedures utilized by organizations (Catalino, 2015; Yin, 2017). Ethnography, narrative, and phenomenological research designs were considered for this study. Ethnography allows the researcher to study groups with a common culture (Lavin, 2017). Since I did not seek to study groups with a common culture, ethnography was not appropriate. Yin (2017) stated that narrative studies help with the understanding of an individual's personal experience. My focus was on the individual experiences of multiple people; therefore, the narrative design was not appropriate. Phenomenological research seeks to study the lived experiences of participants through a phenomenon (Hanson, Balmer, & Giardino, 2011). Because I was not seeking to understand the participants' lived experiences, the phenomenological design was not appropriate. The purpose of the study was to explore the strategies used by participants for creating an IT DRP.

Research Question

What strategies do nonprofit organization technology managers utilize to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts?

Interview Questions

1. What strategies do you utilize to develop and implement an IT DRP to aid in post-natural disaster recovery efforts?
2. What were some of the challenges you faced while building the plan?
3. What strategies were utilized to determine who the critical recovery personnel are?

4. When testing the IT DRP, do you use a specific testing methodology?
    a. What are some of the lessons learned as a result of testing?
    b. How have recovery practices changed as a result of the knowledge gained?
5. How does the IT DRP specifically address natural disasters, and what were some of the challenges you faced during preparation and recovery efforts?
6. How does the IT DRP address resiliency, or the ability for IT operations to resume post-natural disaster?
    a. Were the recovery time objective (RTO) and recovery point objective (RPO) goals realistic?
    b. How have you applied lessons learned for real events?
    c. How have recovery practices changed as a result of the knowledge gained?

Conceptual Framework

The conceptual framework for this study was Holling's (1973) resilience theory. Resilience theory may help to assess the resilience of people and systems to deal with adversity (Fekete & Fiedrich, 2018). Resilience theory uses multiple domains that measure and assess a community's resilience to survive a natural disaster (Briding, 2014). In the literature review, I addressed the current and past uses of the resilience theory in the field. The concept that grounds the study was that Florida-based nonprofit organizations must adopt and implement an IT DRP framework targeting recovery from a large-scale natural disaster. Disasters create significant problems for at-risk communities

(Catalino, 2015). The problem with a large-scale natural disaster is it can influence the resilience of individuals, families, communities, and policies; each of these areas is a domain addressed by resilience theory, and each of the domains has an impact on an organization's ability to recover from a natural disaster.

Stages of resiliency are survival, recovery, and thriving, which are often displayed before, during, and after an adverse event (Ledesma, 2014). Understanding how Florida-based nonprofits plan to protect their IT investment in the event of a large-scale natural disaster, like Hurricane Katrina in 2005, is crucial for survival, recovery, and thriving. Between 2005 (i.e., Hurricane Wilma) to 2017 (i.e., Hurricane Irma), Florida had only one direct impact by Hurricane Debbie early in the 2017 hurricane season. During the decade following Hurricane Wilma, IT infrastructure likely changed in significant ways. In the event of a direct impact, knowing how organizations plan to recover beneficial community services is vital to community recovery efforts. The survival of an organization can be solely dependent upon the same IT workforce who likely just went through the same disaster. Understanding survivability and recovery are necessary for the restoration of services, which could lead to sustainability.

Definition of Terms

Business continuity planning (BCP): The practice of building and improving a business's resiliency in the wake of some event. The four subcategories are business impact analysis, recovery analysis, plan development, and testing (Ready.gov, 2016b).

Community resilience: A community's ability to address events impacting the community (Forrester et al., 2017).

Disaster recovery plan (DRP): A plan to recover IT systems, applications, and data. The plan should be aligned with organizational priorities to recover critical systems and meet recovery point/time objectives (Ready.gov, 2016a).

Emergency operations center: This center serves as the communication and response hub for community, state, and federal level response (Florida Department of Emergency Management, 2019).

Federal response plan: National plan detailing how agencies will work with each other during emergencies (U.S. Department of Homeland Security, 2015b).

Florida Division of Emergency Management: The division of state government responsible for planning and responding to natural and human-made disasters in the state (Florida Department of Emergency Management, 2019).

Nonprofit organizations: Tax-exempt organizations that fall under section 501(c)(3) of the Internal Revenue Code (Internal Revenue Service, 2015)

Recovery point objective (RPO): The identifies the age files must be restored too; generally, a specific point in time (Kozina & Barun, 2016)

Recovery time objective (RTO): A predefined time in which systems must be restored following a disaster or outage (Kozina & Barun, 2016)

Risk management: The process of identifying and analyzing risk to help an organization meet its strategic objectives (Stimson, 2016).

Technology managers: Individuals who plan and direct organizational data processing, information systems, and programming activities (U.S. Bureau of Labor Statistics, 2017).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are unverifiable facts that cannot be proved but are assumed to be accurate or study elements and out of the researcher's control (Grandy, 2015; Marshall & Rossman, 2016). Within this study, I made the following four significant assumptions: (a) the IT DRP will impact organizational resiliency, (b) IT managers would be willing to discuss their experiences openly and honestly, (c) IT managers place value in the IT DRP processes, and (d) IT managers would provide unbiased answers to interview questions.

Limitations

Limitations are areas that may introduce potential weaknesses and affect the validity of the study (Willis & Estanyol, 2018). The limitations of this study included (a) a low number of participants that could have impacted the confidence in the findings, (b) the possibility that interviewees answered questions based on personal bias as a result of unknown environmental factors, (c) findings that may be too specific and not applicable to general audiences, and (d) my personal bias. To minimize the impact of my personal bias, I used multiple sources of data.

Delimitations

Delimitations are the boundaries that frame the scope of a study (Newman, Hitchcock, & Newman, 2015). The scope of this project included 501(c)3 organizations in southwest Florida that have IT operations supported by a small workforce or that are outsourced to a third party. The boundaries of the study included organizations that have been impacted by large-scale natural disasters within the last 20 years. Individuals

selected for interviews had at least 10 years of IT experience and knowledge of IT DRP practices. Another delimitation of the study was the focus on a small portion of Florida. Hurricanes often travel vast expanses and cause damage over a wide geographical area (Emanuel, Fondriest, & Kossin, 2012). By limiting the study to southwest and west central Florida, I limited the breadth of the research to a small segment of the population.

Significance of the Study

The findings of the study could allow for the development of a nonprofit-specific IT DRP framework geared towards post-natural disaster recovery. Previous research has centered on IT disaster recovery; however, a gap exists when examing specific organizational make-up; meaning, there is minimal research focusing on IT DRP as it relates to nonprofits. The concepts of IT DRP and natural disasters are parallel topics in previous research, but those researchers have often focused on the risk evaluation process. Business leaders need to respond to risks and the demands created by a crisis (Taneja, Pryor, Sewell, & Recuero, 2014). In this study, I focused on a particular business sector, nonprofit organizations, and how such organizations adopt and implement IT DRP.

Implications for Social Change

The idea to use nonprofit organizations in southwest and west central Florida stemmed from a large portion of the population's reliance on the services offered by many of these organizations. The findings of this study can be used by those organizations to implement some type of IT DRP process without significantly affecting their bottom line. The lack of a plan can lead to an organization not reopening after a

large-scale disaster, and the local community would not receive the help it requires. Business leaders need the knowledge to leverage their ability to plan and respond to crises (Fernando, 2017). The findings of this study can result in positive social change by increasing the awareness of IT DRP practices and the need for nonprofit organizations to develop such plans. Especially those nonprofits who provide critical need service to the local community.

A Review of the Professional and Academic Literature

The purpose of the qualitative case study was to explore and understand the strategies nonprofit organizations and IT managers use to develop their IT DRP. The following research question guided this study: What strategies do nonprofit organization technology managers utilize to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts? In this study, I explored the multiple domains of resiliency, natural disasters, risk management, business continuity planning, disaster recovery planning, disaster preparedness, IT DRP, IT governance, emergency management theory, and adaptive leadership theory.

In the literature review, I used 73 articles, journals, and conference proceedings. The primary sources for peer-reviewed articles were Google Scholar and the following databases accessed through the Walden University Library: ABI/Inform, Business Source Complete, EBSCOhost, IEEE, ProQuest, Sage Journals, and Science Direct. Additional primary sources came from government websites such as Ready.gov. Of the 73 articles, 89% were either peer-reviewed, dissertations, or governmental-created documents, and 85% are within 5 years of my anticipated graduation date.

I found three key areas of focus in the literature: (a) resiliency domains, (b) business continuity planning, and (c) disaster recovery planning. In the review of resiliency domains, the focus is on community, organization, individual, disaster resiliency, and how they related to each other. The business continuity planning section centers on understanding the potential risk of making the entity more resilient. In the disaster recovery planning section, I concentrate on the process of creating a plan to allow an entity to recover after an event.

Application to the Applied IT Problem

Conceptual Framework

The conceptual framework for this study was Holling's (1973) resilience theory. In this subsection, I discuss resilience theory and provide an analysis of supporting and contrasting theories. Resilience theory aids in the examination of how systems adjust to change and disturbances in their settings (Holling, 1973). Kulig and Botey (2016) suggested that resilience theory is useful to help determine how entities interact across various domains, including how a community responds to adversity. Research has also shown that the theory is useful for studying the impacts of natural disasters on communities (Ozanne & Ozanne, 2016).

Resilience theory. Holling first introduced resilience theory in 1973 to determine the ability of an ecosystem to adjust to change and disturbances while maintaining its relationship with the environment. Holling added that researchers could utilize the theory to ascertain how ecosystems organize, learn, and adapt. The theory implies a management approach to resilience that would allow ecosystem managers to keep options

open and have a regional focus, not the local aspect (Holling, DATE). Borquez, Aldunce, and Adler (2017) stated that resilience theory could be applied to enrich research and noted that the Theory covers many different disciplines, including climate change. There are two ways to study resiliency: one being species come and go, and the other to examine the consistency of the populations based on their presence (Holling, 1973). The two ways of studying populations play out every year (e.g., specific plants and animals [even bacteria] are thought to be extinct, yet somehow, they keep returning). Holling went on to propose that the constant changes in behavior become less important over time, and focus needs to shift to persistent relationships.

Resiliency determines how persistent environmental systems are and measures the ability of an ecosystem to adapt to environmental changes that impact their ability to survive (Holling, 1973). Borquez et al. (2017) stated that resilience is a "dynamic process" that builds-in flexibility that is required to deal with changes in the environment. There is a tremendous amount of research detailing the various domains of resiliency and their associated utilization, which influences various degrees of survivability. However, there appears to be a gap in the literature related to the differences between resiliency and stability. According to Holling (1973), there is a clear distinction between resiliency and stability; stability is the return to equilibrium after a significant event. There is no clear indication in the literature that resiliency will lead to stability or stability will lead to resiliency.

Newer theories have resulted from the evolution of resilience theory. Walker and Cooper (2018) stated that resilience theory, while developed for ecology, has evolved to

include other areas like finance, corporate strategy, and national security. Walker and Cooper went on to conclude that resilience theory can include both human and nonhuman systems. Resilience theory is the basis for other theories, such as community, disaster, and organizational resiliency. Community resiliency is helpful to study how local areas develop and activate their capabilities before, during, and after a disaster (Ozanne & Ozanne, 2016). Disaster resiliency is gaining momentum in research since the Christmas Day tsunami of 2004 and shares similarities with community resiliency (Coetzee, Van Niekerk, & Raju, 2016). Organizational resiliency refers to an organization's ability to adapt and overcome environmental challenges, such as disasters (Valero, Jung, & Andrew, 2015). Resilience theory was originally focused on ecological resilience, mainly how plants coped with changes and survived; however, there has been an evolution of the theory leading to its expansion of use in other sub theories (and subdomains).

Resiliency research. Resilience theory based research covers a wide range of topics and is morphing into more specific domains. Heeks and Ospina (2019) examined information and communication technologies in Costa Rica and what can be learned from other domains of resiliency and applied to make information and communication technologies more resilient. Heeks and Ospina studied resiliency in three information system (IS) streams: IS input systems, IS systems itself, and IS outcomes. The authors found that IS input resilience is dependent on another operator, like a human doing data entry.

Heeks and Ospina (2019) determined that there are four resilience attribute markers: learning, robustness, equality, and scale. They found that the marker of learning

centered on the capacity to build utilizing new and traditional knowledge, while robustness links to the physical preparedness of the systems or its ability to adapt to change. Equality showed that the systems are accessible by everyone, and systems are scalable, meaning that they are relevant to the environment where they reside (Heeks & Ospina, 2019). Resiliency in IS is a requirement for sustainment, or a means to obtain operational sustainability (Marais, 2015). Heeks and Ospina concluded that while there is a growing trend to make systems more resilient and sustainable, there is little connection between resilience and sustainability.

Heeks and Ospina (2019) pointed out that the system is a priority for performance; however, systems are not optimized for resiliency, and plans need to account for resiliency. Park, Sharman, and Rao (2015) suggested that a standard view held in IS is that once a system is operational, it will operate at a constant level of performance. They concluded with the notion that the Heeks and Ospina's resilience framework can contribute to the IS discipline; however, there are barriers, so Marais (2015) proposed that showing resilience in the IS domain could challenge mainstream perceptions.

Van Breda (2018) utilized resilience theory to study the relevance of social work in South Africa. The author's stated purpose was to enhance research in social work utilizing resilience theory. There are suggestions the definition of resiliency is diluted, which leads to criticism of the theory (Fletcher & Sarkar, 2013). Van Breda wrote that early research shows vulnerabilities led to a more negative outcome; however, the author noted that as research evolved, the relationship between the two was not universal. In

resiliency, outcomes are defined as a stable trajectory after some event (Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). Theron (2016) focused on resilience-as-a-process in terms of how youths adjust, tying resiliency back to a human aspect. Resiliency-as-a-process shows how dynamic systems adapt to events that threaten their existence (Masten, 2015). Van Breda found that a focus on process outcomes led to a blurring of the meaning, which leads to the criticisms.

In a process-outcome orientation, resilience theory causes an unnatural split between process and outcomes (Van Breda, 2018). Van Breda (2018) claimed that resiliency has three components (i.e., adversity, outcomes, and mediating factors), and research using resilience theory needs to utilize all three components. The three components, in turn, lead to a change in the definition of resilience by incorporating the three components. Van Breda (2018) purposed that resilience is "The multilevel process that systems engage in to obtain better-than-expected outcomes in the face or wake of adversity" (p. 4). In this case, multilevel means a resilience process spread across multiple domains, allowing for the introduction of other resiliency domains. Van Breda concluded that resilience theory is relevant when critically applied and useful to understand how systems adapt to resource-constrained environments.

Masten (2018) examined the relevancy of resilience theory and its application to children and families. Masten noted that some researchers defined resilience as more of a trait, while others had researched resilience as an ability to adapt, which builds upon being successful while dealing with challenges. Masten and Cicchetti (2016) stated that resilience has two factors: challenges and positive adaptation. They defined the

challenges as risk, stress, or adversities that could affect the well-being of a system and positive adaptions as how well a system is doing. There are similarities when examining individual and family resilience and comparing their resilience to the resilience of schools, communities, and systems (Masten, 2018). Masten also noted, while out of scope for the specific article, that there is an expansion of research investigating resiliency across multiple systems that experience challenges and disasters and the link with individual and family resilience. The author concluded, like Van Breda, that resilience theory is evolving and is spreading across multiple domains.

Masten proposed that there is a profound change happening in resilience theory research that is driven by large-scale threats. These threats include climate change, natural and technological disasters, socioeconomics, war, and terrorism. An essential characteristic of both the work of Van Breda and Masten, while focusing on children and families, was that there is a growing need to expand resilience theory integration across multiple sciences. Thomas, Eisenberg, and Seager (2018) stated that many forms of resilience theory are byproducts of Holling's original theory. Thomas et al. found that resiliency has grown to include an extensive range of disciplines and how those disciplines respond to environmental events. While Van Breda (2018) and Masten (2018) reviewed resilience theory and its use across multiple disciplines, Thomas et al. reported that resilience needs to have different perspectives and not just disciplines. The authors indicated that part of the problem with resilience research is that researchers need to take a holistic approach but offer little guidance in the required boundaries. Thomas et al.

further implied that because there is little to guide researchers, holistic approaches lack a clear definition; this is a problem with the organization of knowledge.

Thomas et al. (2018) introduced the Integral Map that applies to complex systems. Their goal was to be able to integrate knowledge across disciplines and perspectives as well as find commonalities, differences, and gaps. The map represents the interior and exterior of individual and group perspectives and applies to all resilience research (Thomas et al., 2018; Wilber, 2000). The upper left quadrant (i.e., experience) deals with an individual's self-awareness of knowing, interacting, or experiencing a phenomenon. The experience quadrant relates to a person's internal characteristics and is related to their resiliency. Information in this quadrant centers more on individual psychology. The upper right quadrant (i.e., behavioral) relates to the individual's exterior awareness, which includes actions. The behavioral quadrant focuses on humans, technology, or something in the environment (i.e., agents); however, in the quadrant, the actions of the individual agent are considered. The lower left quadrant (i.e., culture) deals with the group's inner awareness; this is purely culture (i.e., shared values, views, and ethics). Lastly, the lower right quadrant (i.e., systems) is the collective exterior awareness and represents the interrelationships between dynamic systems (Thomas et al., 2018). These four quadrants were beneficial for the organization of interview themes and allowed me to search for commonalities and differences among sources and participants' responses.

The articles above provide insight into the many different resiliency-based theories and uses, which show that resilience theory is applicable for a broad spectrum of research topics. The articles show there is a need to expand the use within their respective

fields, but also across other disciplines. All the articles refer to the fact that resilience theory now has more specific domains (subdomains) that have origins back to the original theory.

Resiliency themes. Research themes help identify future opportunities and help guide the literature review to identify emerging themes (Lai, Hitchcock, Yang, & Tun-Wei, 2018). The initial analysis of resiliency reveals it breaks down into a large set and subset of themes. The most common themes are community and organizational resilience, covered in the next section of the literature review. Another resilience theme is human resilience, which focuses on individuals suffering some traumatic event like an economic change or disaster (Masten, Narayan, Silverman, & Osofsky, 2015). Infrastructure resilience presents the idea that systems are interconnected and have a reliance on each other (Thomas et al., 2018). Other prevalent themes include business continuity, disaster recovery, and risk mitigation; each of these high-level themes breaks down in multiple arrays of secondary themes.

Business continuity planning (BCP). BCP is the most common subtheme of the business theme. BCP is a crucial theme to cover because organizations are continually at risk from events that could affect business operations; a key component of business operations is their ability to continue operating after some event (Păunescu, Popescu, & Blid, 2018). Small and medium-sized businesses are lacking in the disaster preparations and BCP, which jeopardizes their existence (Păunescu, 2017). Another sub-theme is a business impact analysis (BIA). The most common reasons for both themes, BIA and BCP, center on the need to conduct a BIA and how and why BCPs are critical.

Community. The community theme has an even broader subset of themes than the business theme. This theme also crosses over into community resilience, discussed later. Community themes, from leadership to resiliency, were critical in helping the study evolve, especially when considering the impacts of a large-scale natural disaster. Briding (2014) stated that the lingering effects of a disaster would cause socio-economic disruptions, which could have longer-term impacts, as seen in the aftereffects of Hurricane Katrina in New Orleans. As disasters impact communities, leadership capabilities are going to get tested; Leykin, Lahad, Cohen, Goldberg, and Aharonson-Daniel (2013) stated that leadership is one of the five impact community constructs post-natural disaster. The others are collective efficacy, preparedness, place attachment, and social trust, all of which are subthemes of community.

Disaster. Another reoccurring theme in resiliency, along with business and community, is disaster. Subthemes include disaster management, readiness, disaster recovery planning, and impacts. Sawalh (2015), organizations need participatory decision-making, strengthening of the ties at the local and national levels, integrated approaches to disaster management, warning and awareness, and last planning. An underlying tone in this section is readiness or preparation; people and organizations need to prepare for potential impacts of disasters. In the United States, state and local governments are the first line responders for disasters affecting the community (Briding, 2014). However, throughout the literature review, there is a reference to the Department of Homeland Security and Ready.gov; these are references to information used to support business in their preparations for disaster. In the time of a disaster, many factors will

impact the outcome: values, ethics, community, or organization culture (Thomas et al., 2018). These themes add to the already extensive list of themes to reference when reviewing the study findings.

Risk. Risk is the second most prevalent theme found. This theme includes risk management and assessment processes, risk prioritization, and risk management. Risks are potential hazards that could have an impact should the risk materialize (Ready.gov, 2019). The risk assessment is the process of identifying risks and what are their potential impacts (see Ready.gov). The risk assessment is part of the BIA process and is discussed later in the literature review. Risks are often prioritized based on likelihood and impact to the organization; a common question is how to mitigate the highest priority items (Allen & Davis, 2010). Assessment and prioritization, along with mitigation, are part of the risk management process (Allen & Davis, 2012).

Systems. Reviewing the literature and identifying additional themes, systems were the second largest grouping. Systems as a theme are not surprising given the extensive use of resilience theory. Subthemes include ecological systems, natural systems, technological, and socio-economic. The originator of resilience theory, Holling, centered on ecological cycles of growth and collapse (Thomas et al., 2018). Natural systems are the forces of nature; Holling (1973) pointed out the events are cyclical, and some years, certain events might happen more than others. Hurricanes are a perfect example of a natural system. Hurricanes (Disasters) occur every year; however, any given area may only feel the effects once every x-amount of years. For example, in 2004 and 2005, many hurricanes affected Florida; then, there was a 10-year gap between impacts. Technology

as a system is also critical; as Thomas et al. pointed out, infrastructure is nested, and infrastructure relies on the security and network communication to operate across boundaries.

Supporting Theories

In the study of disaster preparedness and response, there are numerous resiliency-based domains. While researching resiliency for this study, community, individual, organizational, and disaster resiliency were the most common. The following subsections contain a look into each domain and how they work together.

Community resiliency. Community resiliency is the ability of systems, infrastructure, business, government, and individuals to adapt and recover from conditions, which cause some community harm (U.S. Department of Homeland Security, 2017). In the event of a large-scale natural disaster, many nonprofit organizations will have a vital role in local recovery efforts. Resiliency is not just an internal problem; rather, resiliency depends on external factors (Briding, 2014). Therefore, a nonprofit agency's disaster recovery plan needs to account for the community need; the need must filter down through the IT DRP to restore critical systems as quickly as possible.

Over the last 15-20 years, the world has seen an increase in large-scale natural disasters. Drabo and Mbaye (2015) climate change is leading to an increase in natural disasters, which are increasing yearly expenditures on such events. Large-scale natural disaster events, like hurricanes Harvey and Irma in 2017, tax infrastructure on all levels. During a large-scale natural disaster, the impact on the community, infrastructure, economy, and environment will affect recovery efforts (Drabo & Mbaye, 2015). As

large-scale natural disasters increase in numbers, organizations will need to design systems and plans for resilient information systems (Scholl & Patin, 2014). Recovery efforts need the community, infrastructure, and functioning economic systems to aid recovery efforts.

Individual resilience. Barnes and Newbold (2005) theorized that the development of individual and community resilience is critical for protecting and enabling people in a post-disaster event. Individual and community resiliency is necessary for the recovery of the business. The concept of individual and community resiliency also shows how Holling's resilience theory has expanded from nature or natural domains to new broader domains. By including both individuals and communities, Barnes and Newbold show how resilience theory is expanding outside of environmental issues. In October 2001, President George W. Bush issued Executive Order 13231 dealing with the importance of securing critical infrastructure, which includes agriculture and food, water, public health, emergency services, the military-industrial complex, telecommunication, energy, transportation, banking and finance, chemicals and hazardous materials, postal and shipping (U.S. Department of Homeland Security, 2001). Comparing the Barnes and Newbold article and Executive Order 13231, there is a linking factor between them; humans.

Examining human capital as part of the critical infrastructure is an essential concept for this study, as it is one of the critical questions for interviews; how the organization protects the IT infrastructure (Human or systems) and data before, during, and after an event. Barnes and Newbold (2005) advised that practitioners should not

overlook the significance of the human infrastructure, as it represents a complex variable. There are three critical relationships between the human elements and traditional infrastructure: people need infrastructure for their services; infrastructure requires people to support it; people are necessary for communications and cooperation (Barnes & Newbold, 2005). The first assertion is relatively straightforward, yet debatable; society now requires infrastructure like power, water, and sustainable food sources. There is a reliance on these types of resources. However, the second assertion also suggests that human infrastructure is reliant on the very items that society needs. Without some human interaction, collapses in President Bush's critical infrastructure list are a certainty (U.S. Department of Homeland Security, 2001). Finally, the third role deals with the role human infrastructure plays in communication and cooperation between various elements. Communication is a critical aspect of any large-scale disaster response. The ability to communicate may only exist via battery-powered devices, with no way of being able to recharge the devices (Barnes & Newbold, 2005). Disaster-related impacts on communication and cooperation likely mean teams will work in smaller groups in close quarters.

Organizational resiliency. Organizational resiliency affects the resiliency of the surrounding communities. However, the paradox is the local community, where the employee base lives, recovery efforts influence organizational recovery. Survivability is subject to community resources (O'Neal, 2011). Briding (2014) stated there are four domains, which will influence community resiliency:

- Governments need to be able to function,

- The economy must recover enough to provide for essential resources,
- Residents must be able to recover enough to feel a sense of security, and
- The community must recover enough to provide a foundation for all other resources.

Briding studied the resiliency of post-hurricane Katrina New Orleans. The study itself is critical because of the conclusion that while Americans are fortunate enough to have the vast resources of the federal government, local and state agencies are critical for recovery efforts. These vast resources include those organizations that provide needed assistance to specific population segments.

Disaster resilience. Disaster resilience relates to an organization's or communities, the ability to respond to disasters or natural hazards (Brown & Williams, 2015). Disaster resilience is the ability of nations, states, municipalities, businesses, and households to manage stress and maintain standards in the wake of a disaster to remain a going concern (Sandifer & Walker, 2018). For organizations to respond to any disaster, organizations must seek to understand the various disaster types, mitigation options, their general preparedness for impact; organizations must look at it in terms of response and recovery (MacKee, Askland, & Askew, 2014).

Kim and Marcouiller (2015) studied the vulnerability and resiliency of 10 tourism-based economies, which were affected by hurricanes over 26 years. Kim and Marcouiller stated that natural events, such as hurricanes, could severely damage regional, national, and international economies. The authors advocated that climate change leads to more severe natural disaster events. Kim and Marcouiller advised that

disaster resilience refers to the capacity of people and organizations to adapt and avoid loss. In the context of resiliency: organization and adaptation are hallmarks of resilience theory. Khaloo and Mobini (2016) stated that disaster risk reduction is an investment. Like Kim and Marcouiller, Khaloo and Mobini advocated that climate change is responsible for an increase in naturally occurring events; these events can have a severe impact on communities and impact their resiliency. Structures and systems design should withstand some occurring natural events; however, at some level, those structures will fail. Kahloo and Mobini proposed designing a structure for resiliency now requires anticipating the unexpected, building in resiliency.

Organizational resilience and disaster resilience rely on community resiliency. Jung and Song (2015) investigated the role organizational resiliency played in disaster resiliency. Jung and Song indicated three elements that affect a community's ability to be resilient: frequency, magnitude, and region. Communities and organizations must seek to better prepare for a disaster, which is occurring more frequently, greater magnitude, and broad geographical coverage. Jung and Song state that social structure also plays a role in helping local governments deal with disasters. Jung and Song, organizational resiliency is a product of robustness, redundancy, resourcefulness, and rapidity, as well as structural contingency and resource dependencies. They go on to define each as:

- Robustness: capacity to conduct designated functions
- Redundancy: necessary back-ups and or resources needed to maintain operations

- Resourcefulness: having the necessary plans, recourses, and information to handle business disruption
- Rapidity: prompt restoration of systems and services to support core tasks

Jung and Song (2015), organizational operations affect the level of resiliency. Jung and Song proposed organizational structure might need to loosen before bringing business functions online, depending on the magnitude of an event, Resource dependency is another critical aspect. In a large-scale disaster, organizations may have to find outside resources to help; this means organizations need to reach out to other organizations, even social media sites like Facebook and Twitter. Kim and Hastak (2018) indicated that the role played by these social networks have an impact on the organizational and governmental roles when dealing with local and regional disasters. Kim and Hastak suggested, like Barnes and Newbold, that the one critical element in all social networks is human infrastructure. A key takeaway of the Jung and Song study is the differences in service delivery and disaster management. Jung and Song (2015), collaborative networks may not lead to efficient service delivery; however, collaboration is critical for disaster management.

Sawalh (2015) studied 28 insurance companies registered with the Amman Stock Exchange in Jordan. Sawalh offered that understanding organizational resiliency is significant. The purpose of the study was to examine how insurance organizations view organizational resilience. The study consisted of 28 insurance companies and data collected via surveys and semi-structured interviews. Sawalh reminded readers that people view organizational resiliency differently. Also, culture played a significant role

in organizational resiliency. Respondents were asked to identify risks facing Jordanian insurance companies. Surprisingly, the top three responses were the high level of competition, the loss of customers, and financial losses. Politics and terrorism appear on 75% of the responses, which seems low, given the current situation in the Middle East (Sawalh, 2015). These risks are significant enough insurance companies are highly susceptible to crises and disasters. Respondents were then asked to define resilience in their organization, which aligned to three categories: 1. Organizations that based resiliency on a prior event or significant incident; 2. Organizations that based resiliency on risks and the unknown; 3. Organizational resiliency is a result of a more rational and objective approach. The results show nine organizations fell into category-3, six into category-2, and five into category-1. In the end, there is an implication that organizations would be able to return to normal after some crisis or regional event.

Sawalh (2015) implies that organizations have given less attention to the active side of resiliency. The active side of resiliency is being able to bounce back and cope with future crises by identifying risk and the development of a warning system. Păunescu et al. (2018) indicated that the active side of resiliency is part of the business continuity process. However, the identification of organizational risks, resources, and functions is critical for planning, and to ensure organizational resilience. Sawalh conducted follow-up interviews with three organizations and centered on the role culture played in resiliency. Organization and national culture both played a role in the lack of organizational learning and leadership. Sawalh wrote that in Arab countries, management is short-sighted, and these countries lack the requisite leadership skills needed to steer an organization through

a crisis. The resiliency of organizations and communities is created over time and handled collaboratively. Effective crisis communication, teamwork, and leadership improve organization resiliency; organizations who understand resiliency are more likely to handle disasters of various types. While Sawalh focused on Jordanian insurance companies, the study and findings are in line with other research and provide context for organizational resiliency.

Contrasting Theories

Before deciding to use resilience theory, I looked at using theories, including emergency management theory (EMT) and the theory of disaster preparedness behavior. Jensen (2012) stated EMT is the study of how humans and institutions interact and cope with hazards. The theory of disaster preparedness behavior helps with studying the performance or nonperformance of preparedness behaviors (Najafi, Ardalan, Akbarisari, Noorbala, & Elmi, 2017). I steered away from using EMT and the theory of disaster preparedness behavior because they did not provide a vast scope.

Emergency management theory. EMT is an alternative theory to resilience theory; EMT appears to be a new theory and is slowly gaining a foothold within the realm of disaster preparation and recovery. The idea of emergency management is relatively new (Etkin & Timmerman, 2014). McEntire (2004), in a presentation to FEMA, proposes emergency management is the study of societal and institutional responses to events that cause hazards and vulnerabilities. These events include, but are not limited to, day-to-day emergencies, individual to corporate disaster, local, regional, national catastrophes, among others. McEntire also implies that emergency management

is a managerial function, which allows for the creation of a community (Business) framework for risk reduction and coping with the various disaster types. emergency management theory, community and disaster resiliency, and Holling's resilience theory all share a common thread, sustainability. All theories seek to sustain an entity through some event, and beyond. Another common thread between emergency management, community, and disaster resiliency is the utilization of available resources. Francis (2015) offered that the sustainability of various resources could make a difference in a disaster type situation. The need to manage and sustain various resources is part of the preparedness process.

Disaster preparedness behavior. Najafi et al. (2017) described a disaster as a severe disruption function to a community or society where material, economic, or environmental issues exceed the ability of the impacted entities to cope with the results of a disaster. The theory looks at factors of preparedness, such as awareness, risk perception, previous disaster experience, societal norms, and community (Lindell & Whitney, 2000; Russell, Goltz, & Bourque, 1995). Other studies looking at DPB looked at the impacts social media had on disaster preparedness. Lai and Tang (2018) stated that the use of social media and mobile devices in the United States, China, and Australia were important for information gathering and sharing when it came to disasters. The use of social networks and mobile devices is not surprising given how such systems have embedded themselves in society, and it makes sense to utilize such devices for gathering and sharing valuable information. While researching disaster preparedness behavior, most of the information I found was recent. The recent information could be a result of

the increase in disasters and all the new articles and studies released over the last 5 years. However, while there are roots to other theories, I feel DPB is too new to utilize.

Business Continuity

The purpose of business continuity is to help increase business resiliency. Tracey, O'Sullivan, Lane, Guy, and Courtemanche (2017) stated that business continuity planning is essential for organizations to maintain core functions during some disruption. The United Nations Office for Disaster Risk Reduction (2015) stated that the reduction of risk is a global priority and needs addressing at the local, national, regional, and global levels. Tracey et al. proposed that the BCP process is typically done in a "Predict / prevent" process; this is an asset-based approach. For example, in southwest Florida, BC planners might analyze the chances a hurricane would hit any given area and then develop a plan on how to minimize the risks. Public Safety Canada (2015) described BCP as "a proactive planning process that ensures critical services or products are delivered during a disruption" (para. 7).

Research suggests that nonprofits organizations play a significant role in disaster recovery efforts (Jenkins, Lambeth, Mosby, & Van Brown, 2015). FEMA (2018) stated, in the National Disaster Recovery Framework (NDRF), nonprofits to include voluntary, faith-based, and community organizations play a vital role in recovery efforts in the communities such organizations serve. Community organizations play a critical role during disaster events, and such organizations need to make their BCP and IT DRP a strategic priority.

There are four phases of the disaster management cycle: preparedness, response, recovery, and mitigation (FEMA, 2018; Lambeth, Farris, Garner, Freeman, & Olivier, 2015; Whybark, 2015); disaster management is it is a process and not a one-time activity (Lambeth et al., 2015). The process of disaster management starts with the creation of BCP. McGrady and Blanke (2014) created a process to manage risk through BCP to address the needs of community organizations. According to McGrady and Blanke, their study found that nearly 50% of the community organizations did not have a BCP plan, yet they provide a critical need in times of disaster. The lack of a BCP is concerning, and something future research should seek to address.

Nicoll and Owens (2014) stated that organizations need to go beyond the basics with BCP and tailor their BCP to the business. One area of interest in BC and DR planning is ownership of the process. There is a prevailing thought, which proposes IT is a primary business function, and thus, the process of BCP and DR should be part of the IT governance practices (Hoong & Marthandan, 2014). Organizations must have strong BC, and IT DR plans to survive a natural disaster. The ramification of failed IT recovery cannot be understated; not only is the community facing a traumatic event, but a failure in IT DRP could likely cause people to lose their livelihood, compounding the community issues. Having a DRP is one thing, knowing the plan will execute when needed is just as critical. The ramifications of testing the DRP during a real event cannot be understated. The problem with BC and DR plans is that complacency is the enemy. Krishnan (2012) reviewed how Google runs an annual DR drill known as a multiday disaster recovery-testing event (DiRT). Krishnan proposes that organizations need to make scaled testing

part of their routine; however, organizations need to focus on the more complex issues associated with planning. Krishnan presents an excellent example of issues large companies may face with planning and testing their IT DRP. The real benefit in the article is the IT DRP testing framework, which it creates, and any size organization can utilize it.

Organizations like Google provide a wealth of information for learning; however, there are better lessons from big box store companies like Lowes and Target. Pittman (2011) defined what big-box retailers can teach the government about disaster recovery; Pittman labels Lowes and Target the "Masters of Disaster." These organizations are continuously dealing with some form of disaster events from hurricanes to earthquakes to floods to tornados, yet Lowes and Target can recover their lost assets quickly (Pittman, 2011). Target established a "Corporate Command Center" that operates 24/7; think of it as an emergency operations center but specifically for Target. During a Georgia Institute of Technology presentation, Keskinocak, Swann, Drake, Heier, and Kerl (2008) detailed the DRP process used by Home Depot and Waffle House. Home Depot utilizes a six-step planning schedule, detailing functional areas, assets protection, merchandising, logistics and transportation, regional management, critical response decisions, planning for pre- and post-event needs, and more. These organizations spend a significant amount of time on disaster preparation, so when an event happens that they can execute their plan quickly and efficiently. The idea of preparing for a disaster is as cliché as writing about the need to simulate the plan. The goal of the process is to learn and address issues, with their DRP, before a real event happens (Ludin & Arbon, 2017). However, a failure in

preparation and training will likely result in severe issues for the organization; training works to deal with crises and disasters when their decision-making and collaboration processes are taxed (Tint, McWaters, & van Driel, 2015).

Companies should conduct DRP training sessions; yet, they fail to do so. Like many areas of the business, senior leadership buy-in to exercises is critical to the overall success (Kim, 2013). Simulation exercises are playing a more critical role in business and provide organizations with a learning experience (Farra, Miller, & Hodgson, 2015; Kim, 2013). The first step was risk identification and completing a BIA. Each location must complete the analysis section individually; this is an essential aspect of the process. Many times, organizations conduct the risk assessment and BIA based on their headquarters location; the practice will cause gaps in their assessment. The second part of the process was to develop checklists and workflows of the various teams and positions. The development of these steps was critical to helping ensure the DRP simulation could execute as smoothly as possible. The third phase was to tune resources for specific disaster events. Step four is a critical aspect; organizations should conduct tabletop exercises. These exercises run to help develop the DRP and to provide the first insights into potential issues. The final step, five, was an actual simulation of the DRP. The simulation events run in half-day slots, which not only help to limit the impact on the organization but allow the staff to address plan issues.

There are many types of simulation methods; the two approaches used by Google and the St. Paul Water Department are just two examples. Another example is the use of virtual reality (VR) as utilized by some clinical practitioners. The Farra et al. (2015)

article provided a focus on the educational value provided by VR simulations. One of the more interesting items was the participant's sense of realism and immersion (Farra et al.). Providing a realistic and immersive experience for the IT practitioner would take IT DRP training to a new level and allowing practitioners to understand strengths, weaknesses, and threats better. The information on DRP practices used in another operating environment could help IT researchers determine the best simulation methods. The Farra et al. article did have one shortcoming, which is the case study size. The authors stated that more research is needed to determine if their findings are valid; however, current evidence does support their theory that VR DRP simulations provide a useful education environment. There is a sizable amount of literature and the topic of DRP simulations. The amount of literature implies there is an essential aspect of such simulations. All the articles examined in this paper proposed that the most crucial aspect of simulations is the educational value they provide. Simulating DRPs provides organizations with the ability to identify gaps in their plans.

Disaster Recovery Planning

To many, the BC and DR plans are nonliving documents, and once created, the plans get set aside until needed. The documents should be a living, updated regularly, and the plans must be comprehensive (Savage, 2002). Savage also proposes there are several critical components to the planning process:

- Business risk and impact analysis
- Detail activities for the DR phase,
- Test the recovery process,

- Train the staff on the recovery process, and
- Implement the process.

Using these high-level items as sections ensures the development of the DRP is on a solid foundation. While the BCP and DRP are related, in a recovery context, the plans are two separate items; BCP details the process for resuming the business, and DRP deals with the recovery of IT systems (Cervone, 2017). Although, the DRP is a supporting document of the BCP.

Business impact analysis. The foundation of any BCP / IT DRP should start with a BIA. Conducting a BIA is critical as it is the mechanism and drives an organization's priorities, strategies, and solutions for handling crises (Lee & Harrald, 1999). As such, organizations must identify the types of events and the resulting impacts the events could have on their organization. The goal of the BIA is for organizations to understand the consequences of an interruption to start planning mitigation activities (El-Temtamy, Majdalawieh, & Pumphrey, 2016). When conducting a BIA, businesses should include a detailed inventory of processes, systems, assets, people, and suppliers (U.S. Department of Homeland Security, 2015a). Having an inventory of processes and assets (Physical or human) is crucial to help determine a ranking of critical business requirements for sustainment. The critical component of the BIA is to help determine the impacts an outage has on an organization (Drakulevski & Nakov, 2015). Often this in terms of some financial or brand integrity loss. One of the significant benefits of the BIA is that it helps with mapping the systems to business processes (National Institute of Standards and

Technology (NIST), 2010). Doing so helps with the alignment of the critical business functions and processes to IT systems; thus, helping the restoration process.

There are countless articles that detail the process of conducting a BIA. El-Temtamy et al. (2016) started from the beginning with six simple questions; the authors started by reviewing what already exists, regarding DRP, and morph into questions about personal feelings on the level of risk and training; however, El-Temtamy et al. stop short of presenting a BIA framework. Kozina and Barun (2016), the BIA is critical for organizations because as it allows teams to prioritize recovery efforts based on need. The first step in their process should seek to learn more about the business, its functions, and its vital processes. The second step tries to determine the criticality of the functions, processes, and resources to gauge the impact of an outage. According to NIST (2010), gauging the impacts would include the cost of overtime, fines/penalties, and any new contracts that would be required to help restore the systems. Kozina and Barum write that it is essential to assign a rank to a process or system that would cause a service disruption if down. Often these are associated with a cost per hour if down an impact value (Severe, moderate, or minimal). The third step in the framework is to determine recovery objectives. In step three, the NIST (2010) framework shows there are three-time values that need defining: Maximum Tolerable Downtime (MTD), RTO, RPO. MTD is the time an organization can tolerate downtime for a specific function or process; RTO is the amount of time it takes to recover function or processes after an outage, usually x-amount of hours or days after an event; RPO details how far back in time teams need to go to restore files; often a specific point in time (Kozina & Barun, 2016). The last phase is to

determine the recovery window. The process views recovery objectives from step-3. In this step, processes and services are given a criticality score from 1 to 5.

Items with assigned Category-1 are the most critical items with the least amount of tolerable downtime, usually 0-5 hours. Category-2 items are critical but would have a 6-24-hour window for restoration. Category-3 average impact, and 2-3 days for restoration. Categories-4 and 5 are little to no impact and are often 3 or more days for restoration (Kozina & Barun, 2016). The idea is to create a clearer picture of what systems need restoration first and prioritize the functions needed to restore those systems. NIST (2010) took this a step further and provided a process for the identification of not only the systems and functions but also the required resources. For example, servers that operate a building's heating ventilation and air conditioning system may be critical to business functions, and n restoration needs to happen quickly. In the event hardware loss, teams should have an accurate inventory of the systems detailing the technical information. Having an accurate inventory of hardware and software running on each system is critical to the restoration of services.

Disaster recovery activities. The declaration of a disaster is often a political process. In Florida, the Governor is responsible for declarations of emergencies as defined by Title XVII, Chapter 252, Section 36 (Florida Legislature, 2018). In the event of a natural disaster, the state government makes the declaration accordingly to the Stafford Act (FEMA, 2019b). The process for many organizations is not any different, and organizations need to take the type of disaster into account (Paul & Hariharan, 2012). When the decision to declare a disaster is made, often by the senior leadership team

(SLT), the BCP, and eventually DRP, operate in execution mode. When it comes to the declaration, the type of disaster event is critical. In the case of a widespread weather-related event, the impact on the organization and employees could be substantial. Such an event would likely initiate a calling tree process and relocation of critical staff to a safe zone.

Emergency teams and contacts. Emergency teams play a vital role in disaster response. The first team is the SLT, who would be responsible for disaster declaration; the next team is the executive leadership Team (ELT). The ELT is critical because they should coordinate the responsibilities of the various business lines. The situation will already be stressful for anyone involved; therefore, requiring strong leadership. Emergency teams need to be able to perform under an extreme amount of stress. Corporate governance and leadership play a significant role because a failure in either governance or leadership likely leads to an unfortunate result (Gopal & Kumar, 2015; Omoijiade, 2015). It is not hard to see how poor leadership would affect the recovery efforts of any organization. The ELT would also be responsible for public disclosure information communications. The roles of this team become more extensive as recovery processes drag, especially if the process runs multiple days or months. However, such a time-lapse would depend on the type of disaster declared.

An aspect of the DRP is the development of an emergency contact list and calling tree/priority list (Wiercinski, 2013). Depending on the type of disaster, this process could be complicated. For example, during and after a hurricane, voice/data communication could be difficult and nearly impossible right after such an event. However, in other

disaster scenarios, like a breach, reaching the correct people in a time of need is critical and could be demanding base on daily life. There are 168 hours each week, and only 40 of those are business hours. There are 128 hours each week, where any given employee would likely be engaged in non-work-related activities. On average, an employee spends 76% of their time away from the office. The amount of time an employee spends away from the office implies there is a high likelihood a disaster will occur when employees away from the office, increasing the need for an effective communication process. The calling tree would increase the likelihood of getting the correct people on a call in a more timely and efficient manner. However, it does not account for post-disaster communication issues.

Damage assessment. The purpose of the damage assessment is to gain an inventory of what is damaged and what is needed to reenable IT operations. Often these assessments provide the first survey any financial losses (Smith, 2013). Xie, Wang, and Wu (2018) conducted a study of Naval warfare surface ships and concluded there is no one single form of damage assessment because, in the case of their study, each ship had a different function. The distinct difference is critical when studying businesses, and the differences in the type of business and how they conduct their daily operations. The reasons for conducting damage assessments is to determine the severity of an event, quantify the impact to the business, and determine what resources are required (Minnesota Department of Public Safety, 2016). Organizations should have a listing of all the systems they need to check; identification is part of the BIA process. Each item in the

BIA should indicate a level of damage. The federal standard for degrees of damage is as follows: destroyed, major, minor, and affected (FEMA, 2019a).

Understanding the severity of the damage is critical for insurance filings. Habermann and Hedel (2018) offered that damage comes in two forms: direct and indirect. Both have two sub-categories of tangible and intangible. Direct damage is a result of an asset coming in direct contact with the hazard, i.e., floodwaters. With indirect damage, there is no direct contact with a hazard but happens because of the hazard. There are issues with the monetization of intangible damages, and direct damage will require the monetization of assets (Jenelius & Mattsson, 2015). Monetization is often in terms of replacement or repair costs.

Recovery. The recovery of systems is dependent on the damage assessment and the availability of other resources. The main thrust for recovery is the business priority, critical systems first. There is no one way to determine what the highest priority item is; however, priorities should align with an organization's risk profile (Cervone, 2017). The risk profile helps with mitigating certain risks; disaster mitigation is a requirement for organizations living in disaster-prone areas. One mitigation method is the use of an offsite facility, which provides for cold, warm, or hot failover (Dwiningrum, 2017). In 2015, Kolesov, Bretherton, and Kovalenko authored an article on how to deploy geographically distributed call centers. The article shows how one call center can support another in the event of a disaster. The goal of these kinds of sites is to help organizations meet their recovery goals and remove the impacts on the MTD. Site replication is a common approach to averting costly outages or disasters (Lenk & Tai, 2014). Cloud

architecture is becoming an essential component of disaster recovery plans; disaster recovery-as-a-service is the new wave in cloud computing. The reason is that cloud systems are easily scalable and provides robust infrastructure while being able to control costs (Lenk & Tai). Depending on the company size and revenue streams, cloud architecture could be a problematic solution. When organizations are in the process of developing the plans, CIO needs to be able to compare solutions using a quantitative approach (Alhazmi & Malaiya, 2013).

Plans testing and implementation. Testing recovery plans is a critical aspect for ensuring the plan should adequately functions when required. Smith, Martin, and Wenger (2018) stated that operationalizing such plans is necessary for ensuring organizational resiliency. While trying to ensure resiliency, the testing of DR plans is required so organizations can determine what issues they face and make improvements to the plan. By testing the plan, optimizing the plan, and testing again, organizations should better understand the outcomes, and not merely aim for a plan to help return to pre-disaster conditions (Eid & El-adaway, 2018). Training is a crucial aspect of everything IT; training helps practitioners deal with stressful situations, so when an actual event happens, then practitioners can better deal with the situation. The ability to absorb, handle stress, and recover is the definition of resilience (De Vita, Iavarone, Gravagnuolo, & Alberico, 2018); training helps build in resiliency. For organizations to be resilient, they need to test their plans, adapt to situations, and handle the stress factors.

The goal of any organization, or community, post-natural disaster is to have life return to normal, as much as possible. Organizations who fail to recover promptly, risk

revenue, and brand reputation loss (Alhazmi & Malaiya, 2013). There are mainly two reasons for this, first is the psychological impact “Normal” has on society. The more time recovery efforts take, the more individuals start to worry about the future and stress compounds (Molotch, 2014). The second reason is that organizations are connected like no other time in history and are dependent on the cross-communication and services technology provides. Organizations rely on services provided by third-party vendors or utilities for their everyday activities; these include items like electricity, computer systems, and communication networks (Păunescu et al., 2018). The potential for third-party interruptions affecting brand and revenue loss increases.

Relationship of this Study to Previous Research

In April of 2019, the New Zealand Ministry of Civil Defense and Emergency Management published a report on the country’s national disaster resilience strategy. Ā-Motu and AituĀ (2019) stated the 2011 Canterbury earthquake caused roughly $40 billion in damage or roughly 20% of New Zealand’s gross domestic product. The authors looked at three priorities that impacted the country’s resilience: (a) risk management, (b) effective response and recovery, and (c) community resilience. The stated goal is to become more resilient in all parts of society. Ā-Motu and AituĀ (2019) stated that the identification and understanding of risks are necessary for making decisions. Also, the identification and understanding of risk align with The United Nations Office for Disaster Risk Reduction efforts. The United Nations Office for Disaster Risk Reduction (2015) would like the reduction of risk to be a global priority, at all levels of government. Ā-Motu and AituĀ (2019) suggested that people are the center of emergency management,

and building organizational relationships is necessary. These relationships are necessary because, as Briding (2014) suggested, resiliency is not just an internal problem. Lastly, community resilience improves through investing increasing capacity, and adequacy of critical systems is regularly updated to address identified risks (Ā-Motu & AituĀ, 2019).

Cutter stated, in a 2014 study on building disaster resilience, disaster risk management leads to sustainability. Sustainability is achievable by prioritizing disaster risk reduction, continually assess and monitor disaster risks, build a culture of resilience, build a culture of safety, and have effective preparedness and response plans (Cutter, 2014). The items Cutter presented are not any different from those presented by Ā-Motu and AituĀ. More importantly, they discussed in greater detail this literature review. By better understanding the impacts, organizations can lessen the impacts of disasters (O'Neal, 2011). One item Cutter (2014) pointed out that is important is the need to invest in resilience; however, Cutter infers this will not be easy because there is not a consistent way to measure loss, especially those dealing with death and cultural assets. Therefore, it is essential to establish baselines and create metrics for measuring the effectiveness of the resilience program. Resilience requires coordination between individuals, organizations, communities, and all layers of the government (Cutter, 2014).

When looking at resiliency in times of disasters, sustainability is vital. Organization and community resilience play a significant rule role in sustainability. However, there is a gap in the literature when looking at resiliency, community, disaster, and organizational resilience; none are detailing how sustainability impacts organizational resources, particularly IT resources, and how they would fair when staff is

likely dealing with recovery efforts at home. Organizations must understand the potential impacts large-scale disaster events will place on their employees, and an inadequate amount of available staff will affect an organization's ability to recover (Adams & Berry, 2012). The operations of many 501(c)3s, in Florida, are local to the communities for which they provide services. Also, most of their staff live in areas that could be impacted by large-scale natural disaster events. In events like Hurricanes Andrew and Katrina, found many employees needed to put their own lives back together while they dealt with the needs of their employer. Accounting for the potential impacts on employees is something IT DRP plans need to consider and is hyper-critical for organizations that have a small IT staff or utilize a local/regional third-party vendor. By including potential staff issues as a risk to their IT DRP processes, these organizations can better understand the impacts and prepare. For example, in Miami-Dade County, the population is approximately 2.6 million, and 19.9% of the population is below the poverty level (USCB, 2015). In 1992, Hurricane Andrew had a direct impact on Miami-Dade County. The results saw approximately 82,000 businesses destroyed, and 250,000 people were left homeless. Areas, which were booming before Andrew, are still struggling to recover, over 20-years later. The 20-plus year recovery would support Marshall and Schrank's (2014) theory that disaster recovery may be a process, which has no ends.

Transition and Summary

In Section 1, I introduced the literature, which formed the background of this research. The section included a review of why risk management, business continuity planning (BCP), and DRP processes are crucial. In the literature review, I examined DRP

in terms of impacts on employees and their livelihoods post-natural disaster. Finally, the review of resilience theory from its beginning use in botany to the use of resiliency in IT structures occurred in Section 1. The purpose of Section 2 is to detail the study, including the roles of the researcher, participants, data collection, population, and research method and design. A discussion on reliability and validity also occurs in Section 2.

Section 2: The Project

In this section, I provide (a) the purpose of the research, (b) the role of the researcher, (c) a discussion of the study participants, (d) strategies for data collection and data analysis, (e) information on population and sampling, and (f) the validity of the research. Section 2 also includes details on ethical requirements and my role as the researcher.

Purpose Statement

The purpose of this qualitative case study was to explore strategies utilized by nonprofit organizations' technology managers to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts. Technology managers are individuals who plan and direct organizational data processing, information systems, and programming activities (U.S. Bureau of Labor Statistics, 2017). Partner organizations were nonprofit organizations registered with the State of Florida and may receive supplemental income from the government or organizations such as the United Way. These 501(c)3 in Florida provided a critical need service to the local community. The Florida-based organizations had a small staff size or third-party vendor who provide IT functions. Lastly, the location of the participating IT managers was in southwest and west central Florida. The findings of the study could allow for the development of an IT DRP natural disaster-specific framework targeting the nonprofit sector, which may have challenges with technology. Positive social change can occur by providing awareness of the need for nonprofits to adopt a natural disaster-specific IT DRP framework to support sustainability in order to provide critical services to the community they serve.

Role of the Researcher

The role of the researcher is to develop interview questions, conduct interviews, and analyze and report the results of the study (Kavoura & Bitsani, 2014). For this study, I developed interview questions, recruited participants, conducted interviews, reviewed organizational documentation, provided an analysis of the collected data, interpreted the findings, and reported the results. I also outlined the assumption, limitations, scope, and boundaries of the study. At the time of the study, I had over 25 years of IT work experience, having held positions in software sales, help desk, database administration, Linux and Windows administration, and information security engineering. I also taught IT courses in the same areas for a regionally accredited college. The time I spent teaching exposed me to the vital role many nonprofits play in the daily lives of individuals and families in southwest and west central Florida. In the event one or more nonprofit charitable agencies are not able to recover from a natural disaster, there is a chance those in the community may not have their basic needs met. As such, I developed an interest in helping such organizations be better prepared, contributing to positive social change. The study process allowed for the investigation of organizational processes and procedures for dealing with a large-scale natural disaster. I was the primary research instrument for data collection in this study. Pessu (2015) and Glynne (2015) indicated the qualitative researcher is an instrument through which data collection occurs. In addition to being the primary data collection instrument, I identified my personal bias, which may have affected the study.

I used *The Belmont Report* and its protocols for ethics and protecting human subjects as a guide during this study. Maintaining ethical standards is a critical component throughout the research when human subjects are used (Hammer, 2016). Respecting the participants and ensuring said participants have a clear understanding of the nature of the study, their role, and the process is part of the ethical and protection process (Fiske & Hauser, 2014). Respect for the individual participants and organizations is key to treating them fairly (Blee & Currier, 2011). Treating participants, individuals, and organizations with the utmost dignity and respect are critical to the success of the study. Fair treatment of participants and organizations also falls within research ethics. I validated my understanding of *The Belmont Report* by completing the training provided by the National Institute of Health course, Protecting Human Research Participants (my certification number is 1823099; see Appendix B). I followed the principles (i.e., Respect, beneficence, and justice) as described in the Belmont Report.

As the primary data collection instrument, I guarded against allowing any personal or professional bias to affect my research. Researchers should strive to suppress their biases, values, and background, which could influence the study (Marshall & Rossman, 2016; Moustakas, 1994). My lack of involvement with nonprofit agencies in southwest and west central Florida reduced the effects of my biases, values, and background; however, I also remained open-minded regarding new thoughts and processes regarding the research topic. Addressing forms of bias was required to support the research question and study.

The interview setting and collection instruments played a vital role in the data collection process. Moustakas (1994) stated that qualitative research happens in a neutral setting, and there are many forms of data collection to utilize when using the researcher as the collection instrument. The structure of the interview questions helped to support and guide the semi-structured interviews. Data collection began after obtaining Institutional Review Board approval (approval 11-18-19-0513303) and comprised of interviews, a review of existing organizational documentation, and Internet research. I prepared the interview questions, conducted the primary and secondary interviews, and reviewed existing organizational disaster recovery plans and procedures. The utilized interview protocol appears in Appendix A. Stewart, Polak, Young, and Schultz (2012) indicated an interview protocol includes documenting the data, time, place, and interviewee identification number. The protocol also stipulates how an interviewee should read the consent letter, my note-taking process, a list of open-ended questions, and a process on concluding the interview. Using an interview protocol as a guideline helped ensure each interview followed a standard process.

Participants

The IT managers involved in the study resided in southwest and west central Florida. IT managers had to meet the following inclusion criteria: (a) their organization must be registered with the State of Florida as a 501(c)3, (b) be responsible for making the day-to-day IT decisions that are consistent with the role of the technology manager, (c) have a minimum of 10 years of IT management experience, (d) have experience in IT DRP as it pertains to natural disasters, and (e) have experienced the impacts of

Hurricanes Charlie, Irma, or both. Draper (2015) stated that the selection of participants is a result of their ability to provide descriptive details regarding the research subject. It is critical to interview participants with considerable knowledge of the subject to reach data saturation (Malterud, Siersma, & Guassora, 2015).

The topic of study could have caused possible subjects to avoid participating; IT DRP is not something all organizations want to discuss, let alone provide details on their actual plans. Given the topic, organizations and managers may be reluctant to participate (see Fegran, Hall, Uhrenfeldt, Aagaard, & Ludvigsen, 2014). Therefore, it was necessary to develop strategies for gaining access. To combat this, I needed to stress that I was only seeking the experiences of the participant and not the organization. Peticca-Harris, deGama, and Elias (2016) suggested a four-part process to gain access to participants: study planning, participant identification, communicating with participants, and participant interactions. Hoyland, Hollund, and Olsen (2015) recommended sending an introduction, study benefits, confidentiality information as well as stressing the ease of the interview process as a strategy for gaining access to potential participants. I used a combination of the methods suggested by Peticca-Harris et al. and Hoyland et al.

Gatekeepers are individuals who can help secure access to potential participants (Kristensen & Ravn, 2015). For a gatekeeper to facilitate access, they need to understand the value of the study, provide suggestions for gaining access, and have influence with potential participants (Hoyland et al., 2015; Peticca-Harris et al., 2016). I did not use gatekeepers to help identify potential participants within their organizations. I sent potential participants e-mails containing information on the study and the interview

process, a letter of consent, a letter of confidentiality before requesting their formal participation in the study. After receiving an e-mail back, indicating a willingness to participate, I offered to meet with the participant and discuss any questions before the interview and review the letters of consent and confidentiality with them. I then scheduled a time to conduct the actual interview.

Participating IT managers signed a consent form before conducting any interviews, as required to comply with Walden University's Institutional Review Board process. Ethical research practices must always be maintained; complying with academic institutional requirements is a requirement (Peticca-Harris et al., 2016). The letter of consent and the use of unique identification numbers help protect participant identities (Judkins-Cohn & Kielwasser-Withrow, 2014). Researchers establish trust and a working relationship by keeping participant information confidential (Hoyland et al., 2015). In this study, each participant, organization, and organization documents were assigned a unique identification number. After the participant signed the letter of consent, I assigned the appropriate numbers and scheduled the interview. Providing an environment where participants are comfortable and can provide meaningful responses without worrying about confidentiality is important (Yin, 2017). Establishing a working relationship goes beyond confidentiality and becomes environmental.

Research Method and Design

I used a qualitative, multiple case study design to explore nonprofit organizations' strategies for handling IT DRP. A result of using the case study design is that participants can share their experiences, allowing researchers to develop a theory based on participant

experiences (Petty, Thomson, & Stewa, 2012). Understanding participant experience was vital for the completion of this study. The knowledge gained from their shared experiences can help to create a specific framework for developing a nonprofit IT DRP.

Method

Three research methods (i.e., qualitative, quantitative, and mixed methods) were considered for this study. Each method has advantages and disadvantages (Makrakis & Kostoulas-Makrakis, 2016). I chose the qualitative method for this study because it allows the researcher to explore the experiences of the participants while creating themes from the data analysis (see Moustakas, 1994). The focus of this study was the exploration of participant experiences and perceptions as well as the strategies they used, which aligned with the use of the qualitative method.

Qualitative research has a breadth of scale; it can be observation focused, occurs in a real-world setting, and focuses on participants' experiences (Grossoehme, 2014). The breadth of scale allows the researcher to study groups and individuals in a natural setting, identify themes within the data, and analyze data (Baškarada, 2014; Kemp, 2017). I selected qualitative research because it allowed me to focus on the participants' experiences. For this study, participant experience and knowledge were critical to gain an understanding of the strategies they used for creating and implementing the IT DRP.

Quantitative research seeks to determine the relationships between variables, and a quantitative study is either descriptive or experimental (Barczak, 2015). A researcher would use the quantitative research method if there were a need to test a hypothesis and understand the relationship between variables. The quantitative method is not appropriate

for studies that do not seek to test a hypothesis (McCusker & Gunaydin, 2015) Quantitative research examines the relationship between variables (Tavakol & Sandars, 2014). In this study, I was not testing a hypothesis nor did I seek to understand the relationship between independent and dependent variables; therefore, a quantitative method was not appropriate.

Mixed method research uses both qualitative and quantitative methods to gather and analyze data (Makrakis & Kostoulas-Makrakis, 2016). Mixed methods are appropriate when a researcher seeks to analyze data using a qualitative design and test a hypothesis (Charman, Petersen, Piper, Liedeman, & Legg, 2015). Mixed method researchers must detail how they handle the discrepancies between qualitative and quantitative methods to increase reliability and validity (Tricco et al., 2016). I was not seeking to test a hypothesis or relationshipsor integrating different research methods; consequently, the mixed method approach was not suitable for this study.

Research Design

I used a multiple case study as my qualitative design, using six organizations. The case study design is appropriate for studies that utilize multiple sources for information and allows the researcher to disseminate and interpret information from historical documentation (Yin, 2017). The study drew on information obtained from participants and organizational documentation. Case study research offers the researcher a deep breadth of research areas to include individuals, groups, activities, or a specific event (Cronin, 2014). Case studies are appropriate for research that seeks to evaluate a social phenomenon or decisions (Thompson, 2016). Given the complex decisions and social

aspects of this study, and the need to understand the participant experience with their decision process, the case study design was an appropriate selection.

Ethnography was another design considered for this research. Ethnography design is used to study share beliefs and cultures (Hazzan & Nutov, 2014). Ethnography is ideal when researchers want to understand the culture (Keutel, Michalik, & Richter, 2014). The use of ethnographic design requires the researcher to study the cultures over some time. Ethnographic studies would require the researcher to observe as an event takes place (Goodson & Vassar, 2011). Due to time constraints and the need for observations, this option is not appropriate. Also, the ethnographic design is not ideal for this research because determining when a natural disaster will affect a certain area is nearly impossible. The purpose of this study was to focus on the personal experiences of the participant and not common beliefs and cultures. The use of ethnographic research was not appropriate for this research.

Phenomenology is another design I considered for this study. Studying the lived experiences is the focus of the phenomenological design (Moustakas, 2001; Petty et al., 2012). Phenomenological studies seek the meaning behind the lived experiences of the participants (Tomkins & Eatough, 2013). I explored the lived experiences of the participants; I did not focus on the meaning but rather the processes utilized by the participants. In phenomenological studies, learning about the shared experience can come from interviews, but not documents (Marshall & Rossman, 2016). I reviewed and utilized organizational documentation as part of this study; the internal documentation review conflicts with Marshall and Rossman. As a result of the conflicts with the

phenomenological design and how I conducted my research, phenomenology was not an appropriate design.

As part of the research design, I needed to ensure data saturation. There are two types of data saturation; one occurs during the interview process and the other through the coding process. Interview data saturation occurs when the interviewee does not change the information in subsequent interviews (Thompson, 2016). Member checking plays a critical role, not only as a reliability component but also as a validation of data saturation (Kemp, 2017). Therefore, I collected data until there are no new data points covered. The second form of data saturation occurs when no new information emerges during the coding process (Fusch & Ness, 2015). I reached data saturation during the coding process when I could not code any new themes.

Population and Sampling

The population for the multiple case study was IT managers employed by four nonprofit organizations located in southwest and west central Florida. There was an assumption that each of the nonprofit organizations has at least one IT manager. The size of the population is five and based on data saturation; I conducted interviews until no new information emerged; there were ten interviews. IT managers are individuals who plan and direct organizational data processing, information systems, and programming activities (U.S. Bureau of Labor Statistics, 2017). In qualitative studies, the population's characteristics relate to their experience (Berger, 2015). The characteristics for the IT managers for this study are that they (a) have developed strategies around IT DRP, (b) have been in IT for at least 10 years, and (c) manage a small IT staff of five or fewer

employees or rely on a third-party service provider. Using inclusion and exclusion criteria is critical for defining the population to collect data (Robinson, 2014). The study's population was IT managers who work for four nonprofit organizations in southwest and west central Florida.

A critical aspect was access to an acceptable sample size, which influenced the credibility of the research. Three methods of sampling were considered for use in this study: convenience, purposeful, and census. Convenience sampling allows the research to select samples based on what is convenient, typically allowing for quicker data collection (Singh, 2016). A purposeful sample allows the researcher to identify participants who have specific insight and offer a unique perspective, often based on personal experience (Palinkas et al., 2015). Census sampling is appropriate for studies, which seek to identify strategies used by participants (Eguasa, 2016). The population size is another reason to utilize census sampling. Charman et al. (2015) stated the census sampling is appropriate when the population is smaller. Lucas (2014) offered the census sample involved the entire population; this study used census sampling. The census sample for this study was five IT managers who comprise the population for the study; I conducted ten interviews; the interview process continued until I did not document any new information.

Interviews and member checking interviews occured at the time and place that was convenient for the participants. Using technology was necessary for the interview process; interviews were recorded and were not impactful on the participant. Using conferencing technologies would allow for the interview to be recorded, and would lessen the travel impact on those involved (Rubin & Rubin, 2012); I only recorded audio,

at no time did I capture any conference video. I utilized data collected from multiple sources including interviews and organizational documentation. The use of additional sources help achieve data saturation (Fusch & Ness, 2015). Organizational document reviews consisted of reviewing the BCP, DRP, and IT policies and procedures; participants presented hard copies of their documents.

Ethical Research

Before conducting any research, I presented potential participants with a breakdown of the reasons for the research and potential benefits. The purpose of this presentation allowed participants to make an informed decision on their participation. At which time, the potential participants were provided an electronic and hard copy of the informed consent form. Informed consent is to ensure participation, opt-out options, and confidentiality (Tideman & Svensson, 2015). The informed consent form detailed participants were not paid for their participation, outlined the person(s) of contact, and the allowance to withdraw from the study. The informed consent form was critical to show ethical practices in participant participation and data collection.

Confidentiality and privacy are critical aspects of any study. Mahon (2014) stated that pseudonyms might be used to help protect both the participating organization and person(s) of contact. To help protect the participants, organizations, organizational documentation, interview transcripts, or any reporting or displaying of results was done using the pseudonyms. To protect the participants, I archived all data for 5 years using a 256-bit encrypted USB drive which was password protected, and stored in a fireproof

safe. After 5 years, destruction of the data will occur following the requirements set by Walden University's Institutional Review Board.

Data Collection

Instruments

Data collection consists of the data gathering instruments, data gathering techniques, and data organization techniques. Qualitative methods and case study design rely on the researcher as the primary data collection instrument (Levius, Safa, & Weeks, 2018; Yin, 2017). I was the primary data collection instrument for this study. The researcher's primary role is that of the data collection insturment and interpretation of the data (Moustakas, 1994). The primary data collection method was participant interviews using the semistructured format found in Appendix B. Qualitative researchers need to focus on the data collection, organization, and investigation (Collins & Cooper, 2014). As the primary researcher, my role was to collect, organize, and investigate the data.

Interviews occured at a time and place that was convenient for the participant. The interviews began with an introduction and thank you message for their participation. I then discussed the purpose of the study and any nondisclosure agreements. The list of six open-ended questions, with some additional follow-ups, was prepared to ask each participant. Utilizing open-ended questions allows for each participant to share subjective responses while following the interview protocol (McIntosh & Morse, 2015). Also, the use of open-ended questions allowed for follow-up questions. I needed to monitor the interview time and make sure I covered all the questions. Upon completion of the

interview, I thanked the participant again and discussed the need for follow-up questions and any clarification.

The second type of data collection occurs via a review of organizational documentation. Document reviews allowed me to search across a variety of organizational documentation from BCP to IT DRP. Searching through organizational documents is crucial because these documents are not public and not found in libraries (Smith, 2012). Comparing organizational documentation to industry best practices adds another layer of findings and possibly additional themes. Using best practice material allows for the use of Internet searches (Vakkari, 2012). Using documentation reviews as a data source is a convenient way to access data, there is fewer time restrictions, and it is likely to yield additional information (Edelman, 2012). Reviewing organization documentation necessary to conduct member checking, interview transcript analysis, and reach data saturation. The documentation review can be used to corroborate the IT manager's interview answers.

The reliability of collected data regarding IT DRP practices is a product of examination of the interviews, member checking, and documentation review. Member checking is a critical component for ensuring reliability (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). By using technology managers, as a data source, reliability is verifiable by their position in the organization and experiences. Brear (2018) proposed that member checking increased transferability and validity because the participants participate in four distinct phases: thinking independently, hearing the findings, appraising the findings, and negotiating the representations. Therefore, I

presented my interpretations to each participant and allow them to scrutinize my work and provide feedback. I presented my interpretations of each participant in a follow-up interview. I transcribed interviews to help develop themes; additional member checking interviews occured until no new information emerged. Harvey (2015) advocated member checking continues until a researcher can no longer identify new data points. The use of multiple sources is critical for data validation (Yin, 2017). To help with validity, I used multiple participants, as well as organization documentation such as business continuity and disaster recovery plans.

Data Collection Technique

There were two methods for data collection: interviews and documentation reviews. Using multiple methods of data collection allows for comparison and data validation (Canales, 2015). The primary data collection occured via interviews using open-ended questions. The formal presentation of interview questions occurd during face-to-face interviews and conference calls. The use of tools like Teams provides the researcher and participant the opportunity to meet face-to-face while separated by a distance (Redlich-Amirav & Higginbottom, 2014). Keeping the interview to 60 minutes lessened the impact the interviews had on a participant's daily schedule. Additional questions were asked during the interview or through follow-up telephone. Petty et al. (2012), interview durations of 30 to 90 minutes is appropriate. I anticipated that the initial interviews would last about 60 minutes. All face-to-face interviews were recorded using Samsung's Voice Recorder, and a web-based interviews were conducted using my Microsoft Teams account with the record option set. I used the transcribe feature built

into Teams to transcripe interviews. By Walden University policy, researchers shall store all recorded and transcribed data in a secure location for 5years.

I used member checking to validate the information obtained during the first interview; the purpose is to determine the credibility of the data and my interpretation. Researchers must continue member checking until no additional information emerges, and no new themes are identified (Harvey, 2015). Follow up interviews; member checking interviews occured via Teams or face-to-face. The follow-up interviews allowed me to probe for additional information and verify the initial findings with the participants. Follow-up interviews were part of the member checking process as it reinforces the reliability and validity of the information (Marshall & Rossman, 2016); it is common practice to allow participants to review transcripts (Patton, 2015). Member checking will also allow me the opportunity to make sure I did not missinterpret the interviewee.

The second data collection method utlized documentation reviews, as proposed by Edelman (2012). I worked with local nonprofit organizations to gain their approval for helping with the review. For this review, I examinted both BCP and ITDR plans. I made my request known when I sent the introduction email; formal request for document access occured during the interview and a follow-up interview. These documents were critical to help me gather a broader range of preserved processes (Interviews) and compare those against the actual plan. I conducted a review of organizational documentation, such as the BCP, and requested the participant to upload the file(s) to a secure FTP server via secure file transfer protocol (SFTP) or a password-protected e-mail

attachment. Access to secure documents occured from my laptop to ensure the confidentiality of the document was not compromised.

Data Organization Techniques

Researchers need to achieve a level of confidentiality and anonymity for individual participants and partner organizations. Confidentiality and anonymity are achievable by assigning unique codes to each participant and organization (Grossoehme, 2014). To create this level of confidentiality and anonymity, I assigned an alphanumeric code to any participating individual and partner organization. Individual participants were coded starting with the letter P; partner organizations were coded starting with the letter O. Elo et al. (2014) implied that utilizing data organization would help with trustworthiness and data integrity. All interviews occurred via face-to-face or Microsoft Teams. Samsung's Voice Record was used to record face-to-face interviews; Microsoft Teams interviews used the recording features provided by the application. All interviews were transcribed using featured within Teams and by hand for the Samsung Voice Record. All electronic documentation, including peer-reviewed articles and trade publications, are stored in a coded file system for journaling. Also, handwritten notes were transcribed using Microsoft Word and stored electronically. Transcriptions were coded using a combination of the participant code and eight-digit date. An aspect of this process was using an interview protocol (see Appendix B); interview protocols are critical to ensure a standard process throughout all interviews (Dikko, 2016). The combination of the participant identification process and interview protocol allowed for correlation of notes. Using tools is to help organize qualitative data for data analysis is

vital to help answer the research question (Leech & Onwuegbuzie, 2007). NVivo helped with data analysis by sorting data and identify themes.

Using an encrypted, external hard drive (EHDD) helps keep all electronic information secure. A fire/waterproof safe serves as the storage location for the EHDD and any handwritten documents. An SFTP server was provided for participants to send any electronic documentation; the SFTP server resided on my system. Processes were established to ensure the files are being sent directly to a share on the EHDD. Per Walden University protocols, the data will remain in a protected location in my home. Destruction of data will occur after 5 years. Destruction of any written and printed material will occur via using a cross-cut shredder, also at the 5 year mark. The formatting of the EHDD will use a tool like Western Digital's Data Lifeguard tool; low-level formatting would ensure the format is complete.

Data Analysis Technique

The process of analyzing data does not start after data was recorded. Researchers must perform data analysis in qualitative research in an iterative process. To accomplish this, I analyzed collected data until I had a meaningful answer to the research question: What strategies do nonprofit organization technology managers utilize to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts? Data organization is critical to aid in searching for patterns to help with the identification of themes, and determine what is critical to the research questions (Bengtsson, 2016; Noble & Smith, 2014). Identification of patterns and themes is critical when performing data analysis (Patton, 2015). I used Nvivo to organize and analyze data, looking for themes and

patterns with the data. I used an inductive approach for data analysis. An inductive approach is necessary because the researcher pulls themes from collected data versus a deductive approach that pulls themes from other studies (Kruth, 2014); qualitative studies most often utilize an inductive approach (De Massis & Kotlar, 2014; Kruth, 2014). I utilized Nvivo to help with coding; the purpose of the code is to identify concepts or themes gathered during the interview process. Coding occured using transcriped interviews and organizational documentation as sources. I utilized methodological triangulation for this study. Triangulation is required to analyze the data obtained from the interviews, documentation review, and Internet research. Triangulation is helpful to identify different prospectives, themes, and increase the reliability and validity of a study (Marshall & Rossman, 2016). Triangulation is critical as it allows for the verification of data, and a quicker means to find anomalies.

There are multiple types of triangulation: data, investigator, theory, and methodological, each having benefits. Denzin (1978) stated that methodological triangulation is a consistency checker for researchers to evaluate findings using different data collection methods. I used methodological triangulation methods to analyze data collected through semistructured interviews and documentation reviews. Yin (2017) proposed that data analysis must be organized, reviewed for meaning, organized by word patterns, utilizes for theme development, developed into a narrative, and interpreted. The process of data analysis included the use of interview transcripts, peer-reviewed journals, and trade publications for coding and theme development to organize data. By coding the data, I was able to organize data points and determine if there are any trends. Finding

themes in the semistructured interviews is vital to direct the conversation towards specific topics. Identifying themes and coding will help the researcher determine when data saturation has been achieved (Higginbottom, Rivers, & Story, 2014). Another data source was the review of organizational documentation as it pertains to BCP and IT DRP.

Documentation reviews were critical for the triangulation of interview findings. The purpose of reviewing other source material was to conduct data triangulation (Patton, 2015). Assessing and comparing data from multiple sources is productive for data collection (Akhavan & Dehghani, 2015). To perform triangulation, external data sources, such as organizational policies, procedures, and professional publications, must be reviewed. The benefits of methodology triangulation are to confirm the findings, increase the breadth of data, and heighten the reliability and validity (Horne & Horgan, 2012).

Data analysis included information from my literature review, conceptual framework, the information I collected during the interview process, and organizational documentation reviews. Tools like NVivo provided automated analysis of study artifacts to used create mind maps, cluster analysis, relationships, and themes. I ran the analysis against the interview and organizational documentation artifacts individually. I compared those results with information found in the theming section of the literature review.

Reliability and Validity

Qualitative research must develop meaningful and compelling findings in a trustworthy manner to help ensure reliability (Stevens, Lyles, & Berke, 2014). Trustworthiness occurs when the research is dependable, credible, transferable, and

confirmable; these are principles to quantitative research principles of validity, reliability, and objectivity. By using IT managers for interviews, corporate policy reviews, and peer-reviewed articles, reliability can be achieved by scrutinizing the credibility of the information. Interview questions are a guidepost for the researcher; a list of the interview questions can be found in Appendix A (Hobson, 2016; Yin, 2017). The key to reliability is the scrutiny of the information. Searching for common themes between data sources also helped to ensure reliability (Marshall & Rossman, 2016). With reliability being a key component, the researcher must provide a map for others to follow. Reliability also occurs using consistent and repeatable processes (Lancaster, Kolakowsky-Hayner, Kovacich, & Greer-Williams, 2015). The elements discussed in this section play a crucial role in the creation of a roadmap for future research to follow.

Dependability

Researchers must consider dependability during the design phase. Dependability is another component of reliability and requires the researcher, and other researchers, to further scrutinize information (Petty et al., 2012). In the case of interviews, dependability occurs by asking participants to evaluate the interview in two phases. The second phase of the member checking process and follow-up interviews are allowing participants to scrutinize the interpretation presents a positive impact on the dependability of that study (Marshall & Rossman, 2016). The use of member checking ensured the interpretation of the participant statements is accurate and dependable. Using an interview protocol (Appendix A) helped with consistency through all the interview processes; Yin (2017) stated that the use of case study protocols is a method of ensuring dependability. To

ensure that participant privacy and help lessen interruptions, I found locations that were convenient for the participants and offered a quiet place to conduct the interview.

The need to use multiple sources, including interviews, peer-reviewed articles, and trade publications, cannot be understated. Data collection from multiple sources helps with theming and validation. The researcher must establish validity from the beginning of the research (Cooper-Thomas, Paterson, Stadler, & Saks, 2014; Tufford & Newman, 2014). The quality of the sources and depth of research also increases validity. Validity in qualitative research relates to the depth of data collection and analytics on the chosen topic (Hobson, 2016). There are varying opinions on validity; some researchers see validity to measure data interpretation. Others see validity to measure the study against the design (Griffith & Montrosse-Moorhead, 2014). I sought to understand why, how, and the results of actions taken during an event. An explanatory case study is appropriate because the researcher is trying to understand the decision processes of the participant (Yin, 2017). The data collected, from interviews and other sources, was used in triangulation to identify themes and inconsistencies. Data collection comes from semistructured interviews, organizational documentation reviews, and reviews of peer review sources and government documents. Member checking occurs to ensure the interpretation of the participant's statements is correct. Interviews and documentation review occured in a business environment.

Credibility

Credibility is achievable by using authoritative sources. Elo et al. (2014), credibility depends on a population that is well informed, authoritative, and relevant. The

utilization of sources that are well informed, authoritative, and relevant adds a level of credibility and authenticity to the research. Method triangulation of different sources supports consistency through the collection of data between sources (Denzin, 1978). I used method triangulation to interpret data from interviews and reading organization policies and procedures. The use of semi structured interviews, along with member checking, ensured both consistency and data saturation. Consistency of information is achievable by using multiple sources, which impacts credibility via the depth of the study (Klenke, 2016). Using multiple methods to gather, verify, and record data elements are critical to establishing credibility (Yang & Wu, 2014). The interviews were recorded using an audio device; needed to help ensure the accuracy of the transcription.

Transferability

Transferability in qualitative research refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings. Transferability allows for the findings of one study to be applied to another study when conducted using similar approaches and subject matter (Lub, 2015). One issue with transferability is who is responsible for ensuring a study is transferable. Research shows that transferability is the responsibility of the person or persons who utilize another's research (Lincoln & Guba, 1985). To transfer research from one must make interpretation of the search and determine it if transferable; therefore, transferability is the responsibility of the person seeking to utilize the research. Turner (2016) implied that one way for the researcher to control transferability is to use member checking; hence, the validity of the data for future studies. Another aspect of transferability is data saturation;

Morse, Lowery, and Steury Morse (2014) stated that data saturation occurs when study participants no longer respond with new details. Member checking and data saturation is a theme throughout Chapter 2; Member checking and data saturation keep reappearing because they are critical aspects of this research. I worked to ensure transferability by utilizing member checking and ensuring data saturation; however, there are no guarantees of transferability.

Confirmability

Another important aspect of research is confirmability. Confirmability in research relates to the audit trail the researcher provides (Izard-Carroll, 2016). The audit trail is essential for research replication purposes. Audit trails allow others to a way to replicate research using the same methods and techniques used by the original researcher(s) (Cho & Lee, 2014). To provide an audit trail, I utilized a reflective journal. There are many benefits to utilizing a reflective journal, including being a reflective component for what one learns during the research. The learning aspect is essential for others who may want to conduct another study in the same manner or audit the research. Williams (2015) detailed that the reflective journal allows other researchers to audit data, processes, analysis, and personal notations. Confirmability is simply an audit trail, and the audit trail validates everything about the research by providing a record of activity and processes.

Transition and Summary

In summary of Section 2, my role was to complete the interviews, review the information from interviews, review organizational processes, and review available data. It was necessary to utilize a repeatable process during data gathering activities, to help

ensure data accuracy. Any information utilized from Internet sources was examined and reexamined for accuracy. Therefore, only academic journals, peer-reviewed articles, data from government sources, and first-hand accounts are appropriate for use in this study.

Section 3 consists of a reporting and discussion on the findings of my research. The report and discussion include a review of organizational IT DRP processes, before, during, and after a large scale, a natural disaster. The goal of this section is to provide information to the reader and let them decide if the reviewed practices would be viable for their business model.

Section 3: Application to Professional Practice and Implications for Change

The focus of this study was on exploring the strategies used by IT managers at nonprofits to develop their IT DRP. My goal was to use the findings to bring about change in disaster recovery planning used 501(c)3 organizations. This section includes a study overview, presentation of findings, application to professional practice, implications for social change, recommendations for action, further study suggestions, personal reflections, and a conclusion.

Overview of Study

The purpose of this qualitative case study was to explore strategies utilized by nonprofit organization technology managers to adopt and implement an IT DRP to aid in post-natural disaster recovery. I used four cases of 501(c)3 organizations operating in southwest and west central Florida. Data gathering occurred via interviews with five participants responsible for IT DRP and organizational documentation reviews. The findings showed the strategies managers used to create and implement IT DRP to aid in post-natural disaster recovery.

Presentation of the Findings

This section contains a discussion of the three emergent themes of the study. The following research question guided the study: What strategies do nonprofit organization technology managers utilize to adopt and implement an IT DRP to aid in post-natural disaster recovery efforts? With additional research, the findings of this study could help develop a specific IT DRP framework for 501(c)3 organizations to help reduce the risks posed by natural disasters. I conducted semi-structured interviews with the participants,

focusing on strategies to create their IT DRP, identifying key personnel, and determining the RPO and RTO needs. I also reviewed organizational documentation, disaster recovery plans, and business continuity plans (if available). After completing data collection and analysis, three themes emerged: (a) planning uses existing knowledge, (b) testing and training is needed, and (c) everyone is essential. These themes identify why a less complicated framework is required.

Theme 1: Planning Uses Existing Knowledge

The first theme identified from data collection was that strategic planning uses existing knowledge (see Table 1). During interviews, the topic of planning was discussed 49 times and was found 89 times in organizational documentation. Some participants reported using the NDRF, information from other organizations, and reliance on their own body of knowledge from previous work experiences. Participants 1 and 2 responded that they created their plans based on the NDRF, but they were more a result of the post-9/11 operating environment and not related to an actual need to use that specific framework. The IT DRP provided by Participants 1 and 2 has policy statements regarding planning, including: “An IT DRP shall be created to encompass systems,” “The IT DRP shall be updated as technology and practices evolve,” and “the plan shall be tested.” The IT DRP does list critical systems with RPO but does not account for RTO or MTD or data loss. Participants 3 and 5 concluded their plans utilize previous knowledge gained over their careers. The BCP and IT DRP provided by Participant 3 list critical aspects, such as roles, responsibilities, and restore processes. In the BCP, sections on BIA and risk identification are missing. Participant 4 stated, “Our plans are based on knowledge gained

from operating other companies where such plans were required, but also used other resources to help assess and manage risk." After reviewing the organizational documentation, I did not find any references to a specific framework. Participant 5 stated, "We are a small organization, and many of us have multiple functions. I was asked to write the plans because I had written plans for another nonprofit." Participants 1, 2, 3, and 4 do not have plans specifically referencing natural disasters. Participant 5 did provide documentation on the organization's hurricane-specific plan. All participants reported that given their operating environment, along with personnel and financial constraints, detailed plans are not a top priority, and additional resources are required.

Resource constraints play a significant role in planning efforts for all participants. Four out of 5 participants expressed a need to utilize multiple resource types, including funding, staffing, and time, to support the risk management program. Participant 2 stated, "We simply do not have enough employees to do more with our IT DRP then what is already being done." Small staffing levels is a significant issue for these organizations. Smalls staffing levels are a result of funding allotments for such organizations. The need for funding impacts staffing levels and directly impacts existing staff time-on-task and testing. Participant 3 conveyed that while there are limited funds, they could invest in training; however, they do not have time to step away from their daily routine. Participants 1 and 5 stated their staff is so small that they are already stretched thin and do not have the time required to update and test plans adequately. Participant 2 suggested they simply could not afford to invest more time into IT DRP because other projects have a higher priority. Participant 4 said, "IT DRP is a good idea, they feel it is not critical, and

they need to focus on other areas of the operation." Participants need to go beyond basic risk management processes; however, they require an investment in staff, training, and time.

Table 1

Planning Uses Existing Knowledge

	Participant		Document	
Major Theme	Count	References	Count	References
Planning	5	49	7	85

The literature review provided insights into the need and process for the creation of BCPs and DRPs. The purpose of BCPs and DRPs is to make a business more resilient, according to a prediction-prevention process (Tracey et al., 2017). It is essential to differentiate between BCP and DRP. While BCP details the process of resuming business functions, the IT DRP specifically addresses IT systems (Cervone, 2017); IT DRP is a supporting element for BCP. There are many different frameworks available for creating such plans. FEMA (2018) suggested that the purpose of the NDRF is to restore the fabric of a community. The reality is that the framework builds in resiliency for the implementors, and by choosing not to use a framework, organizations put themselves at risk of a failed recovery. The premise of the FEMA article supports the use of the NDRF by Participants 1 and 2; they provide a unique service in the state. FEMA also stated that volunteer, faith-based, and community organizations play a vital role in recovery efforts. Any disruption in their operations will have a ripple effect across a substantial portion of the state. While the other participants do not use a specific framework, they did rely on a

body of knowledge gained over 25-year or longer careers. Researchers have also discussed the need for senior leadership to be involved in the process. Corporate governance and leadership play a significant role because a failure in either governance or leadership likely leads to an unfortunate result (Gopal & Kumar, 2015; Omoijiade, 2015).

I used Holling's resilience theory as a conceptual framework for this study. Resilience theory was introduced in 1973 to determine an ecosystem's ability to adjust to change and disturbances while maintaining its relationship with the environment (Holling, 1973). Planning is an essential process for establishing IT resiliency. Holling suggested that resiliency is a measure of the relationships in systems and how those systems absorb changes. Planning allows organizations to examine the relationships between their systems. It is important to note that systems can be both human and nonhuman (Walker & Cooper, 2018). Another aspect Holling proposed was that there is a difference between resilience and stability; stability is an equilibrium state where everything is predictable, and resilience emphasizes the need for persistence. Organizations that build plans are building in some resilience, and their goal is to get the operating environment back to a stable state. Holling also stated that a critical aspect of resilience is the ability to keep options open.

Walker and Cooper (2018) reported that resilience theory, while developed for ecology, has evolved to include other areas, like finance, corporate strategy, and national security. Including other theories that evolved from resilience theory, in the discussion of IT resilience, is vital to the understanding of how resilient IT systems are. Since the

creation of resilience theory, it has morphed into theories used outside of botany to address items like community, organizational, and disaster resilience. The U.S. Department of Homeland Security (2017) defined community resiliency as the ability of systems, infrastructure, business, government, and individuals to adapt and recover from conditions that cause some community harm. Organizational resiliency is directly related to community resilience, and there is a dependence on both organizational and community resilience. O'Neal (2011) suggested that organizational survivability is also dependent on the community and subject to community resources. Disaster resilience relates to organizations or communities and their ability to respond to disasters or natural hazards (Brown & Williams, 2015).

In the event of a large-scale natural disaster, all five participants will likely require community resources to aid in their organizational recovery efforts. There was no mention in any plans about the potential impacts of community issues as they related to natural disasters and organizational resilience. Kim and Marcouiller (2015) suggested that disaster resilience refers to the capacity of people and organizations to adapt and avoid loss. Tracey et al.'s (2017) model of predicting and preventing is a tool for organizations to use to help create specific plans around likely to occur or high-impact events. Only one participant, Participant 5, had a specific hurricane plan. A review of the plans occurs yearly as hurricane season starts and provides an adequate summary of the process and procedures should such an event take place. Planning is a critical component for building in IT resilience and bringing organizations back to a stable state.

Theme 2: Testing and Training is Needed

The second theme identified was IT DRP testing and training is limited as it relates to organizational plans (see Table 2). The topic of testing and training was referenced 65 times during the participant interviews. There were 129 references to testing and training in the participants' BCP and IT DRP documents. When asked how each organization tested their plans, 3 out of the 5 participants responded they do not test their plans. Participants 1 and 2 responded that they do not test their plans; however, they do conduct monthly tests of their backup systems. Both the BCP and IT DRP documents provided by Participant 2 show the plans should be tested and appropriate changes made. There is no reference to testing frequency. Participants 1 and 2 suggested that over the last 4 years, they have tested their plans in production. During hurricane season of 2016, 2017, and 2019 they felt impacts from Hurricanes Mathew, Irma, and Dorian on operations. Both participants stated they do test backup and restore procedures monthly. When asked if they do any type of engagement with vendors, Participant 2 acknowledged that when there is an approaching storm, they do reach out to critical vendors to make sure they would be able to get replacement equipment if required. Participants 3 and 4 do not test plans at all. Participant 3 stated that plan reviews occur every few years; however, they do not conduct any type of annual testing or training exercise. The IT DRP does call for yearly testing of restore processes; however, testing does not occur. The plan breaks down testing requirements into individual components: audio/visual components, workstations (i.e., Windows and Mac), and network. Each component should be tested individually, then as part of the network. Participant 5 stated, "Our infrastructure can be

brought online when the initial impacts are resolved." Participant 5 provided a hurricane-specific plan and stated, "While we do not test the plan, we do open it up prior to the start of hurricane season and review it." The hurricane plan triggers when the National Hurricane Center issues a hurricane watch for their area. Documentation shows that a daily meeting is to take place once the hurricane watch is issued. The hurricane plan requires teams to begin validating systems to make sure there is an accurate inventory of systems, and backups are not corrupt. When asked about vendor engagement with DRP plans, Participant 5 responded that they do not test with vendors, and if something were to happen, they would have to wait for new equipment.

Further discussions on testing of IT DRP revealed the similar constraints highlighted in Theme 1. When asked about testing their plans, all participants understood the need for testing; however, testing is not a high priority when factoring in time and resource constraints. Participant 1 stated, "As with your framework question, this too comes down to a matter of staffing, funding, and time. We simply do not have enough of any to run any type of test or training scenarios adequately." Participant 2 shared that testing and training are not a top priority, given the size of the team. Participant 3 stated, "While our plans are not specifically tested, we do take into account lessons learned from real experiences of our sister organizations." When asked for clarification, Participant 3 stated that because the organization is part of a national body, other organizations' lessons propagate to all areas. Participant 4 reiterated previous statements that there are higher priorities, and testing is not a critical need. Participant 5 stated, "We do not have

the time or resources required to test plans." Participants understood the need for testing and training cycles; however, there are other priorities within the organizations.

Table 2

Testing and Training

	Participant		Document	
Major Theme	Count	References	Count	References
Testing/Learning	5	65	7	129

A review of the literature showed the need for testing plans and training scenarios. The review also discussed why testing and training are vital for organizations and their ability to function post-disaster. Disaster management is a continual process (Lambeth et al., 2015). The process is not something you start and forget. The idea behind planning and testing the plans is that when an event does occur, the recovery process runs as smoothly as possible. The goal of testing is for organizations to learn and address issues before they occur (Ludin & Arbon, 2017). Testing the plans is critical, so when an actual event occurs, the decision-makers can think more clearly because they have already been training in such scenarios (Tint et al., 2015).

Researchers have also looked at ways to conduct testing. The methods include week-long, drawn-out exercises such as those used by Google and Home Depot (Farra et al., 2015; Keskinocak et al., 2008). Organizations have even looked into the realm of VR. Simulation exercises play a critical role in business and provide organizations with a full breadth of learning (Farra et al., 2015). Farra et al. (2015) also suggested that the use of disaster recovery simulations or VR aspects can add a sense of realism and immersion.

The added realism is like that of the mass casualty drills many municipalities, especially around airports, run every year.

Resilience theory discusses how random events influence systems and how these events influence outcomes. Holling (1973) suggested that there is positive and negative feedback resulting from random events. Holling looked at the impacts of flooding, fires, and other ecological events had on the ecosystem. Holling provided there is a considerable change when dealing with external influences, and when dealing with unexpected events, the conversation switches from resilience to existence. With IT systems, many of the natural events Holling discussed can be simulated and tested. Random events play a critical role in helping increase resiliency within systems. Building in resiliency is a dynamic process that is flexible enough to deal with the changing environment (Borquez et al., 2017). To build resilience, an organization needs to test their plans. Heeks and Ospina (2019) suggested that learning and robustness are two of the four resilience attributes. Learning centers on the capacity to build utilizing new and traditional knowledge; robustness links to the physical preparedness of the systems, or its ability to adapt to change. Organizations need to build in learning and robustness with continuing education and testing plans to help identify gaps. For example, how organizations coup with recovery when their employee base is dealing with personal recovery issues. Work-home recovery is a paradox many organizations face because they relied on the local community for recovery, yet the same community has to recovery as well. The paradox of work-home recovery presents a real problem for these small organizations. In the case of a damaging hurricane, employees need to deal with their

situation at home. Then they can turn their attention towards the office; however, the need to restore business functions is equally as critical. The loss of critical personnel or vendors is something organizations can quickly test. Disaster resilience is the ability to manage stress and maintaining standards after a disaster (Sandifer & Walker, 2018). The stresses associated with a disaster are magnified by not testing plans and identifying gaps. These added stresses are examples of the external influences that Holling said would lead to a discussion on continued existence or non-existence.

Theme 3: Everyone is Essential

The third identified theme details how organizations determine who the critical staff members are (see Table 3). The topic of staffing arose 58 times during participant interviews; there were 91 references to staffing in participants' BCPs and ITDRPs. There is no rhyme or reason for determining who is critical and who is not; this is the result of funding and staffing levels. All five participants conveyed that the most critical personnel are those of the leadership team. Participant 5 stated, "When it comes to recovery efforts, the leadership team is going to need to make critical decisions that affect the future of the organization." The BCP lists the contact information of the SLT and that of the other leaders who have additional responsibilities pre- and post-hurricane. The disaster plan does not call out any critical positions or individual; however, the hurricane plan provides precise details as too the requirements of leadership and each leader's role. The list of leaders and responsibilities includes information for both pre- and post-hurricane. In the case of technology, the IT manager will coordinate the evaluation, and recovery, of all networked systems; validating all systems are in working condition and ready for users,

telephony systems are operational, and the alarm system is functioning correctly. When pressed about the IT staff, Participant 5 concluded recovery of IT assets would require all team members because the staff is small. Participants 1 and 2 provided their team is small and spread over multiple counties in west central Florida. When asked who is critical, they stated the entire team. Their BCP calls out that the IT managers are responsible for overseeing the recovery of IT infrastructure, and the recovery order of critical business systems. The contact section of the IT DRP lists primary and alternate contact information for both managers. The IT DRP states that personnel west (South) of US-27 would handle restore operations in west central Florida, and team members east (North) of US-27 would be responsible for restore activities in central Florida. The location of staff in association with the location of offices will likely play a significant role in recovery efforts. Participant 2 said

> Use the recent near-miss of Hurricane Dorian as an example. Had the storm hit where they originally thought, a large portion of our team would have been impacted. However, part of the team lives and works on the west coast of Florida. They would not have been impacted at all.

The BCP plan for Participant 3 lists the executive committee as the primary recovery leader. The IT manager is not part of the executive committee; however, the position plays a significant role in recovery efforts. The IT manager position is in the IT DRP as leading IT recovery operations. The IT footprint of this organization is small; however, they depend on systems being available when needed, and they are inter-connected. The IT DRP details what systems need to restore first, what order, and how to conduct testing.

The process is more than one person can handle; however, the recovery plan does not list any other positions as critical. The BCP provided by Participant 4 divides the recovery team up into two teams, primary and backup. The IT manager will oversee recovery operations. The Key Team Members section of the IT DRP lists contact information for all team members. Participant 4 stated, “Recovery will be an all available hands situation.” When asked why they needed all available hands, the response was that many on the team would be dealing with personal impacts.

On September 10 and 11, 2017, all five participants had to deal with the ramifications of hurricane Irma. Participants 3, 4, and 5 felt the direct impacts. All three participants stated that the eye of Hurricane Irma passed directly over their buildings. Each reported only minor damage and none to their IT infrastructure. Participant three stated, “Our staff members had more damage to their homes then we had at our location. The biggest problem we faced was the lack of power for almost 3 weeks.” Participant 4 stated, “Hurricane Irma would have been more impactful had it moved further west. Otherwise, I do not think we would be here today.” Had Irma moved ashore at Ft Myers Beach as initially thought, Participants 4 and 5 would have felt the brunt of the hurricane and likely lost operations for a long duration. Participant 5 stated, “As a result of Hurricane Irma moving further east, we were spared the worst of the storm. Our facility did not sustain any structural damage. Had Irma took the original projected path, we would have lost everything.” All three participants have staff who live within 20 miles of their facilities. When asked what the most significant impacts from Hurricane Irma were, all three answered “Power.” When asked if they would look to move critical staff to a

safer location, before such a storm, Participant 3 stated, “No. Our team members need to take care of their families first.” Participant 4 stated, “We will not ask anyone to seek shelter in a different location.” Participant 5’s answer was similar to the others. The identification of critical staff appears centered on individual operations and expectations. Only Participants 1 and 2 have staff spread out over a multicounty area; this could make recovery efforts easier. While Participants 3, 4, and 5 have critical staff identified, they also realize the need for those staff members to deal with their lives at home first and the business second.

Table 3

Essential Staff

	Participant		Document	
Major Theme	Count	References	Count	References
Staffing	5	58	7	91

The literature review documented the need to understand the makeup of the recovery team. Sawalh (2015) suggested that proper teamwork and leadership improved organizational resiliency. In most cases, the SLT plays a critical role in disaster recovery. They set the tone for the entire organization; how the SLT responds to an incident will propagate through the entire organization. Omoijiade (2015) suggested that corporate governance and leadership plays a significant role in recovery because if either fails, then the results will likely be catastrophic. Therefore, the SLT and IT managers need to understand the plan and staff recovery teams accordingly. All five participants understand the need to have their respective leadership teams involved in recovery efforts. All aspects of the IT DRP are critical, including the BIA. IT teams need to prioritize recovery

efforts; by prioritizing recovery efforts, team staffing occurs according to need (Kozina & Barun, 2016). Organizations need to understand the make-up of their recovery teams before a real disaster. These teams will likely be performing under an incredible amount of stress (Gopal & Kumar, 2015). All five participants are well aware that their staff is likely to experience challenges post-large-scale natural disasters like Hurricane Irma.

There is an interconnection between staff members recovery, the recovery of a critical need organization, and the recovery of the local community. There is a balancing act that organizations play to affect the outcome. Infrastructure resilience is the idea the systems are interconnected and have a reliance on each other (Thomas et al., 2018). Walker and Cooper (2018) suggested that systems can include both human and nonhuman elements. In the end, humans are a critical component of organizational recovery. In the case of IT assets, with the human element, those assets are not going to return. There are important aspects for understanding who the critical staff members are; effective crisis communication, teamwork, and leadership improve organizational resiliency (Sawalh, 2015). Organizations that understand resiliency are better equipped to handle disasters and crises.

Resilience theory looks at the relationship between systems and their environment. It is the relationship between the roles of the recovery teams, the environment they support, and the effects of the post-natural disaster operating environment that relates to resilience theory. Holling's initial resilience theory looked at the roles various systems played within their environment. Holling (1973) suggested that undisturbed systems are likely to be transient, and it is not until some other event occurs

that they become influenced by those events. When looking at essential staff, it is essential to understand they are like the undisturbed systems Holling was discussing. Staff will continue to go about their daily routines until some event like a hurricane. At this point, the recovery team's routine will be influenced by the effects of the hurricane, in terms of home and work recovery. Holling also points out that there is a relationship between systems and the events they go through, which help build resilience. Each event is a learning opportunity that is valuable not only for oneself but for their employer. It is important to remember that when looking at resilience theory, there are many variations on the original theory. Walker and Cooper (2018) stated that resilience theory, while developed for ecology, has evolved to include other areas like finance, corporate strategy, or national security. Human resilience focuses on individuals suffering some traumatic event like an economic change or disaster (Masten et al., 2015). The human factor Masten et al. is discussing is the relationship between systems, events, and resilience that Holling discussed. Barnes and Newbold (2005) purported that individual resilience is critical for protecting and enabling people in a post-disaster event. Individuals who go through a natural disaster could become critical for their employers. Organizations must understand the makeup for their teams, and identify critical personnel, especially those with past experiences. Păunescu et al. (2018) suggest that the identification of organizational resources and functions is critical to ensure organizational resilience.

Applications to Professional Practice

The specific IT problem that formed the basis of this research was that some nonprofit organizations' technology managers lack strategies to adopt and implement an

IT DRP to aid in post-natural disaster recovery efforts. Participants in this study provided insight into their operating environment and the methods they used to develop their IT DRP. There are different perspectives on the need to have an IT DRP geared explicitly to any natural disaster. Most participants stated that they rely on personal knowledge to build their plans and do not use a proven framework. I identified three primary themes while analyzing data: knowledge, testing, and staff. IT managers and organizational leaders could use these results to understand organizational gaps better and to facilitate the creation of an IT DRP to aid in post-natural disaster recovery efforts.

Organizations and IT leaders who seek to address disaster recovery of their IT assets need to have more than basic knowledge of risk management processes and seek to understand how to utilize existing IT DRP frameworks. Organizations will see a high level of assurance in the IT DRP by advancing organizational knowledge in risk management practices. Establishing sound processes now should enable organizations and IT managers more flexibility to address future challenges with their IT DRP. This study's findings show that there is a lack of strategies used by nonprofit IT managers. Thus, organizations need to invest in their risk management processes and plan accordingly.

Organizations and IT managers must continuously evaluate risk and mitigation processes. As resource allocation shifts and technology changes, leaders must understand how those changes may impact the organization. Understanding the impacts could be as simple as conducting biannual risk analysis and yearly disaster recovery training. By having an advanced understanding of risk management techniques, organizations may be

better prepared. For IT managers, having a clear understanding of an IT-specific DRP framework could mean the difference between organizational recovery or permanent closure. The findings in this study show that while there is some level of planning, the plans themselves are simplistic and require refinement. Organizations can use this finding as a basis to show there is a need for continuous education and additional funding.

Testing is a critical aspect of all risk management type plans, including IT DRP. Frameworks provided by the International Standards Organization, NIST, U.S. Department of Homeland Security, and NDRF have sections devoted to testing plans for a reason. In most cases, testing plans are part of the life cycle. Untested plans are themselves a receipt for disaster. To properly evaluate the effectiveness of the plan, teams need to train and test their plans. Training and testing plans are not any different than how local communities, in Florida, conduct yearly disaster training. Like local, state, and federal agencies, organizations need to learn and address weaknesses in their plans. The study shows that there is a minimal appetite for testing plans. Many factors prohibit such tests; adequate funding is the primary concern from all participants. Leaders must understand that testing their plans is critical for the recovery of their organization, especially when they are responding to a large-scale natural disaster. At the very least, in hurricane-prone areas, plans should be evaluated before the start of hurricane season.

Organizational leadership and IT managers must work together to understand how best to utilize staff in recovery efforts. All participants in this study reported having small staffs, and everyone has a critical role in recovery efforts. What was not addressed is what happens when one, or more, of those critical staff members, are not able to help

with recovery. Especially given that same critical staff members are to feel the same impacts at home. In the nonprofit world, funding plays a significant role in the amount of staff these organizations have. Therefore, it is paramount that organizations do everything they can to address shortcomings before an actual event.

Implications for Social Change

The results of this study showed strategies used by nonprofit IT managers to create an IT DRP to aid in post-natural disaster recovery. The benefit of the study shows there is a gap in preparedness for 501(c)3 organizations. Numerous factors are leading to this gap; it includes knowledge, funding, and staffing sizes. In most cases, these organizations fill a vital role in the community, and should one of them not remain resilient, then the community will go without a critical need. The information provided by this study can provide a positive social change by calling attention to the gap in overall preparedness levels. The study has shown that there is a need for organizations to prepare better; however, there significant barriers to overcome. There is a significant funding increase needed so organizations can be better prepared. A 501(c)3 specific framework would allow organizations the flexibility to implement a plan and not put undue burdens on the team or budgets. With a better understanding of the existing capabilities many of the organizations have, there is an opportunity to look at creating an IT DRP framework that would be simple enough to use for planning and testing purposes.

The benefits of organization planning go well beyond the cases in this study. Local communities are becoming more dependant on the services provided by 501(c)3

organizations. Unfortunately, as demand for services grows, so does the financial need of the nonprofit organization. With the ever-shrinking budgets, these organizations have to do more with less. Due to the funding issues, many of these organizations do not have the required resources too adequately invest in proper IT DRP practices. The resource gap created by funding paves the way for outside organization help. In 2016, a study conducted at Florida State University (FSU) showed there were 69,310 nonprofit organizations in Florida. Of those, 56,615 had the 501(c)3 filing status. The FSU study estimates Florida's nonprofit sector employs roughly 7% (Nearly a half million people) of Florida's workforce. The knowledge learned from this study can help improve the overall likelihood that many of these organizations increase resiliency enough to survive a large-scale natural disaster.

Recommendations for Action

I explored the strategies used by IT managers for the development of an IT DRP to aid post-large-scale natural disaster recovery. The study findings presented a different picture than expected; participant strategies are loosely based on the National Disaster Recovery Plan or personal knowledge gained in previous positions. Most IT managers chose to rely on previous experiences and existing plans to either create or update plans. - For organizational leadership to address the issue of resiliency in their plans, they need to start from the top down to redevelop these plans. Natural disasters in Florida are a way of life; thankfully, those large-scale natural disasters to not occur regularly, and that is part of the problem. The frequency of large-scale natural disasters is relatively small.

However, when they hit, the damage path is often widespread and stretches resources; building resiliency into plans is critical for survivability.

Creating an IT DRP to address resiliency needs support at the highest levels of an organization. The leadership team must own the message and drive the cultural change which is required. Cutter (2014) stated that sustainability is achievable by prioritizing disaster risk reduction and building in a culture of resilience. For many of these organizations, the cultural change is likely to be difficult, but that culture change will impact the outcome post-disaster. Overall size and budgets create another problem for many of these organizations. The shortcomings in financial intake often leave them with having to choose between tasks. In the case of risk reduction, the likelihood of a hurricane does not match the budgetary outlay for spending money to create and test detailed plans.

Those responsible for the IT DRP need to go beyond the basics and boundaries of their own experiences. There is a level of education required to build such policies and build resiliency. At a minimum, IT managers should utilize the information provided by The Department of Homeland Security at Ready.gov. The site provides a wealth of resources for both BCP and DR, including IT DRP; there is also the NDRF provided by FEMA. ISO and NIST also provide BCP, DRP, and IT DRP frameworks. The existing boundary of basic knowledge is too limiting and could very well put an organization at higher risk. The boundary of basic knowledge is more related to budget and time constraint problems, as training is expensive, and many of the organizations cannot afford to send employees. In most cases, the same organizations cannot afford to have their IT

manager or staff out of the office for training sessions. These gaps in knowledge, and the ability to close the gaps, create a more significant risk.

As part of the cultural change and boundary expansion, organizations need to conduct yearly tests of their plan. As staff and technology change, so does the need to conduct a test. Without regular testing, those changes in staffing and technology introduce new variables that go unnoticed. Teams need to understand the impacts of how new and old variables interact with the plan. In Florida, there is a 6-month off-season for testing such plans. However, other constraints keep this from happening. I would even offer that some of these organizations should be part of larger-scale disaster drills that local and state governments conduct. These larger-scale disaster drills include non-government resources; this would allow organizations more visibility in the broader community recovery plans and bring a focus to their recovery efforts.

The study may be beneficial to community emergency planners, leaders of nonprofit organizations, and those responsible for business continuity management community. I will convey the findings to those involved in the nonprofit sector via direct communications as such when time permits. I also intend to share the results using social media and the organizational website.

Recommendations for Further Study

There are numerous limitations to this study, which warrants extending research. The research method created limitations due to the design, the data collection from a limited number of organizations, and the participants themselves. Qualitative research

can be subjective and allow for unintended bias. Even though there are “Safeguards” used to try and keep bias out, it does tend to creep into a study.

This study was too restrictive as it relates to the partner organization. For future studies, I would expand beyond 501(c)3 organizations and include 501(c)4, not for profit, organizations. It may be advantageous to not restrict partner organizations by filing status; however, this would also require changing the research question. The idea is to allow for the inclusion of larger organizations with more significant IT footprints. In the case of this study, most of the organizations were too small. I would recommend that the participant pool be considerably larger than five. The use of five participants from small nonprofit organizations severely limits results and does not create an accurate picture of the operating environment.

The study identified numerous areas where the organizations are falling short, and it uncovered a lack of strategic thinking. For example, when asked what strategies a participant used to determine critical recovery personnel, the simple answer was that everyone is critical; there were some variations. Most organizations did not use any type of standard, like NIST 800-43 or ISO 22301, as a framework for building their recovery plan. Most relied on previous work experiences to create and update their existing plans, or personal knowledge augmented with some additional research. I would recommend further studies where the IT DRP framework helps identify participants. Not only would this indicate some level of maturity in their processes, but I feel it would provide better insight into the actual planning process.

I focused on the strategies used by the IT manager to develop their IT DRP. However, I now feel it is as equally important to learn more about the perceptions of IT DRP. I would recommend additional qualitative studies, or even quantitative studies, to explore the perception of IT DRP and the need to develop and test such plans. Also, I would recommend expanding the participant pool beyond those responsible for IT management by including all decision-makers. Having completed the research and looking at the data, I am very concerned about the casual attitude about the subject and the overall sense of need. The casual attitude is concerning, considering all the organizations reside in a hurricane-prone state. I feel, by understanding the perception of IT DRP, knowledge about organizational culture would be gained and prove helpful for further studies.

Reflections

The doctoral study process was a journey filled with numerous obstacles; however, the obstacles allow one to grow. Perseverance is a keystone trait needed to complete this journey; I encountered many more obstacles then I should have; many self-inflicted. What I learned was how to conduct and analyze research and how research may affect others. I learned that you just have to push through the trials to reach the end goal, and too never lose sight of the finish line.

Having been in IT for over 25years, I understand the need for IT DRP. During that time, I have seen the impacts natural disasters have on technology teams and businesses. I took efforts to remain objective and prevent any personal bias from affecting the results. The semi-structured interviews could have, unintentionally, allowed

some personal bias to insert itself. I did my best to ensure credibility and reliability were protected. I feel I learned more from the participants concerning strategies used for creating an IT DRP.

Summary and Study Conclusions

Organizational resiliency is not something that should be taken for granted, and just because there is a plan, it does not guarantee resiliency. Organizations need to develop real plans based on a framework and test those plans. They, and the community they serve, cannot afford for some of these organizations to shut down; there is too much as stake. The cycle of plan, test, learn is critical to the overall outcome. While testing does not guarantee a successful outcome, it does allow organizations the ability to learn and adapt their plans before a real event.

Adequate resources, human capital, and funding are critical for all organizations. In the case of the participant organizations, many do not have the time or money to build out their plans adequately. Before identifying valid conclusions, one should conduct an expanded, more in-depth study. However, based on the findings from this study, even the development of a simple reusable framework would likely help many of these smaller organizations attempt to be resilient and reopen post-large-scale natural disaster.

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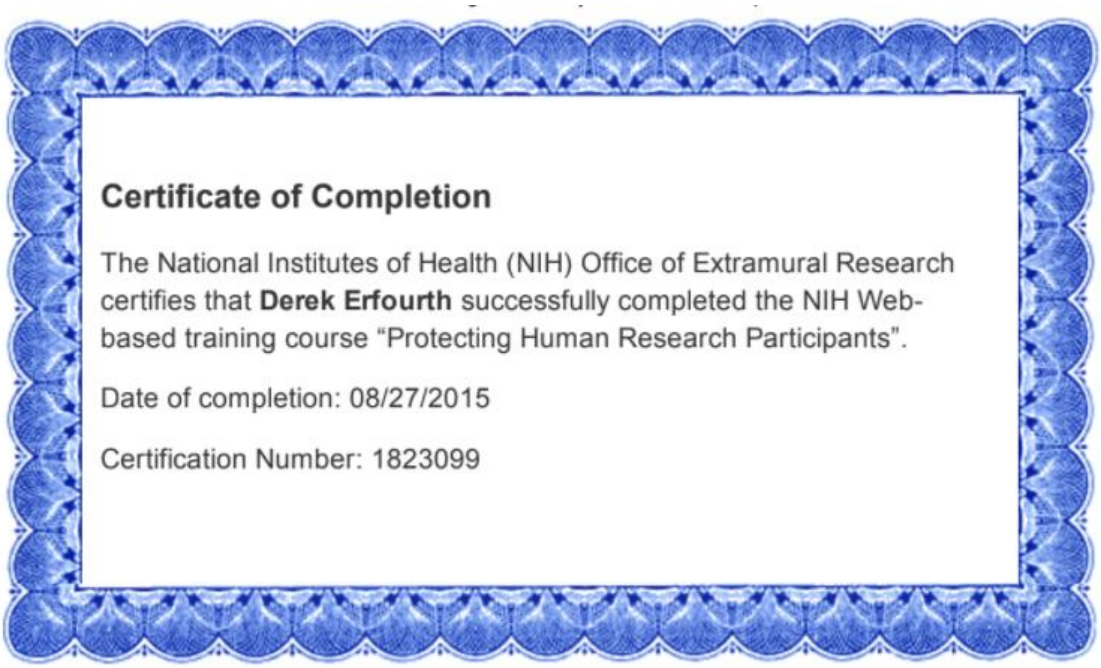
Appendix A: Interview Protocol

Information Technology Disaster Recovery Planning by Florida Nonprofit Organizations		
Date	Time	Location
Interviewee Number		
Step 1	Introduction	Thank the individual for taking valuable time to help with the study
Step 2	Study purpose	State the purpose of the study: The purpose of this study is to explore IT DRPs and the strategies used by nonprofit technology managers to aid in post-natural disaster recovery efforts.
Step 3	The participant describes why they are participating	The information will aid me in completing my doctoral study and fulfill a requirement to obtain my Doctorate of Information Technology
Step 4	Describe the benefits of participation	This will help determine the extent of knowledge and past experiences
Step 5	Discuss ethics	In keeping with ethical practices, ask the participant for their permission to take notes on the interview. Organizations can stop the interview, and participation, at their discretion.
Step 6	Confidentiality	All information will be kept confidential and stored on encrypted devices for 5-years. Also, handwritten notes and storage media will be stored in a locked safe for 5-years by Walden University IRB requirements.
Step 7	Participant questions	Ask the participant if they have any questions or concerns.
Step 8	Interview transitions	State this is a semi-structured interview

Step 9	Interview Questions	1. What strategies do you utilize to develop and implement an IT DRP to aid in post-natural disaster recovery efforts? 2. What were some of the challenges you faced while building the plan? 3. What strategies were utilized to determine who the key recovery personnel are? 4. When testing the IT DRP, do you use a specific testing methodology? a. What are some of the lessons learned as a result of testing? b. How have recovery practices changed as a result of the knowledge gained? 5. How does the IT DRP specifically address natural disasters, and what were some of the challenges you faced during preparation and recovery efforts? 6. How does the IT DRP address resiliency, or the ability for IT operations to resume post-natural disaster? a. Were the RTO and RPO goals realistic? b. How have you applied lessons learned for real events?
Step 10	Interview conclusion	Thank the participant for their time. Make sure to ask if it is ok to ask clarification questions if needed. Also, ask for the participant's best method for clarification

Appendix B: NIH Human Subject Research Certificate of Completion



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Derek Erfourth** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 08/27/2015

Certification Number: 1823099