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Incorporating Data Governance Frameworks in the Financial Industry

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Abstract

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MBA, Grand Canyon University, 2014

BS, Kanshi University, 2000

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Data governance frameworks are critical to reducing operational costs and risks in the financial industry. Corporate data managers face challenges when implementing data governance frameworks. The purpose of this multiple case study was to explore the strategies that successful corporate data managers in some banks in the United States used to implement data governance frameworks to reduce operational costs and risks. The participants were 7 corporate data managers from 3 banks in North Carolina and New York. Servant leadership theory provided the conceptual framework for the study. Methodological triangulation involved assessment of nonconfidential bank documentation on the data governance framework, Basel Committee on Banking Supervision's standard 239 compliance documents, and semistructured interview transcripts. Data were analyzed using Yin's 5-step thematic data analysis technique. Five major themes emerged: leadership role in data governance frameworks to reduce risk and cost, data governance strategies and procedures, accuracy and security of data, establishment of a data office, and leadership commitment at the organizational level. The results of the study may lead to positive social change by supporting approaches to help banks maintain reliable and accurate data as well as reduce data breaches and misuse of consumer data. The availability of accurate data may enable corporate bank managers to make informed lending decisions to benefit consumers.

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Dedication

I dedicate this study to God. God gave me the strength to go through the doctoral journey and helped me complete this study. I also dedicate this study to my mother and my family.

Acknowledgments

Firstly, I would like to thank God who gave me courage and strength to go through this journey. Secondly, I would like to thank my mother who was there to support me. I would also like to thank and acknowledge my committee chair, Dr. Harris; second committee member, Dr. Glenn; and university research reviewer, Dr. Snyder. Finally, I would like to thank DBA program director, Dr. Davis; my professors throughout my doctoral journey; my managers; my research participants; and other university staff. I could not have done this without your help and guidance. Thank you for your support and encouragement.

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Section 1: Introduction to the Study

In 2013, the Federal Reserve mandated a new regulation referred to as the Basel Committee on Banking Supervision (BCBS) 239 for financial institutions in the United States (Chakravorty, 2015). The regulation requires all global systemically important banks (G-SIBs) to establish data governance frameworks (Chakravorty, 2015). Although the data governance framework was not a new concept, the framework received considerable attention in the financial industry since the mandatory implementation of BCBS 239 compliance (Grody & Hughes, 2016). Chakravorty (2015) and Grody and Hughes (2016) provided insight into data governance frameworks, however, they did not present recommendations on the strategies that could be used to implement data governance frameworks in financial institutions, which would have been beneficial in implementing a data governance framework. Given this gap, there was a need for further investigation to identify possible strategies to be used in implementing a framework in financial institutions.

Background of the Problem

The complexity of information technology (IT) infrastructure in the banking industry is great due to many application systems used to conduct daily operations (Grody & Hughes, 2016). Chakravorty (2015) found that the complexity of the system infrastructure increases with large banks, especially G-SIBs because G-SIBs use a variety of application systems. G-SIBs are integral to the domestic and international economy. Failure of any G-SIBs could create a negative impact on a domestic and or international economy. The Federal Reserve mandated the BCBS 239 regulation in 2013; the BCBS

239 regulation required all G-SIBs to establish a robust data governance framework to manage risk and regulatory data that contributes to risk and regulatory reports (Chakravorty, 2015). Therefore, the need to improve reliability, speed, accuracy, and security of data are crucial (Date, 2016; Phan, Flo, & Patel, 2016). Banks rely on data for daily operations; data are managed and stored in many applications systems and manipulated through manual processes, which increase operational costs and risks (Kerle, 2015). Researchers have focused on the need for a robust data governance framework in banks (Chakravorty, 2015; Kerle, 2015; Krishna, 2016) and have recommended further research on strategic initiatives to implement a data governance framework in banks, which could reduce operational costs and risks (Siddiqa et al., 2016). Therefore, the objective in this study is to explore the strategies that successful corporate data managers in some banks use to implement data governance frameworks to reduce operational costs and risks.

Problem Statement

Corporate data managers in banks find a high level of intricacy involved in implementing a data governance framework in their organizations due to the complexity of the IT infrastructure (Grody & Hughes, 2016). According to Chakravorty (2015), 67% of G-SIBs members responded that a future redesign of IT infrastructure was required. The general business problem was that some corporate data managers are negatively affected by a high level of IT infrastructure complexity, which results in high operational costs and risks. The specific business problem was that some corporate data managers in

banks lack strategies to implement data governance frameworks to reduce operational costs and risks.

Purpose Statement

The purpose of this qualitative multiple study was to explore the strategies that successful corporate data managers in some banks use to implement data governance frameworks to reduce operational costs and risks. The target population consisted of seven corporate data managers in three banks located in North Carolina and New York who had developed effective strategies to implement data governance frameworks in their organizations to reduce operational costs and risks. The results of the study may lead to positive social change, as bank leaders may use the findings to maintain reliable and accurate data as well as reduce data breaches and misuse of consumer data. The availability of accurate data may enable corporate bank managers to make informed lending decisions to benefit consumers.

Nature of the Study

I used a qualitative method to identify and explore the individual experiences of corporate data managers who had demonstrated success in addressing the specific business problem. While, researchers use the quantitative method to examine relationships or differences among variables to test hypotheses (Park & Park, 2016; Venkatesh, Brown, & Bala, 2013), I did not seek to test hypotheses, and therefore the quantitative method was not appropriate for my study. Mixed-methods research techniques are a viable mode of exploration when there is a need to use quantitative and qualitative approaches within the parameters of a research study (Venkatesh et al., 2013).

However, because the purpose of the study was not to develop or test hypotheses, a mixed-methods approach was not appropriate. In qualitative research, researchers explore a problem through interviews with the subject matter experts (Park & Park, 2016; Venkatesh et al., 2013). Qualitative research methods allow for flexibility, dynamism, and detailed textual descriptions needed to address the research problem (Merriam & Tisdell, 2015). Researchers use a qualitative method to identify and explore the context of information gathered through interviews to assess its relevance in addressing the specific business problem (Park & Park, 2016). As the current study focused on understanding strategies, it was important for the approach to be flexible.

There are several research designs in the qualitative method in addition to the case study, such as phenomenology, ethnography, grounded theory, and narrative (Park & Park, 2016; Venkatesh et al., 2013; Yin, 2014). Each design has its appropriate use, and the use depends on the nature of the study (Park & Park, 2016; Venkatesh et al., 2013). A case study is appropriate to conduct in-depth analyses of events to answer a research question and to understand experiences through interactions with participants (Yin, 2014). Phenomenologists explore the meaning of the participants' lived experiences to answer a research question (Venkatesh et al., 2013). This approach was not appropriate for this study because the focus of the research is not on the lived experiences of the participants to explore the essence of a phenomenon; rather, the study's focus was to explore multiple cases for common themes. An ethnographic design is suitable for researchers who seek to observe and understand groups or organization cultures (Crampton, 2016; Robinson & Shumar, 2014; Vesa & Vaara, 2014). Because the study's

focus was different from that of ethnography and the research was not reflective of exploring a unique phenomenon based on the experiences of a specific cultural or ethnic group, ethnography was not the appropriate research design. A narrative design is appropriate when a researcher is exploring the participants' recollections of life experiences regarding a phenomenon (Park & Park, 2016; Venkatesh et al., 2013). The narrative approach was not suitable for this study because it is based on gathering stories from interviews with participants, and I needed multiple data sources about strategies leaders use. On the other hand, a multiple case study was suitable to identify, explore, and explain strategies of corporate data managers from three different banks. Based on the above analysis and the nature of the study of data governance frameworks in the banking industry, I chose a qualitative multiple case study to explore the strategies that corporate data managers use to implement data governance frameworks in their organizations to reduce operational costs and risks.

Research Questions

The research question I chose to guide the study was the following: What strategies do corporate data managers in banks use to implement data governance frameworks to reduce operational costs and risks?

Interview Questions

1. How long have you been involved in the design or implementation of data governance frameworks?
2. What are the challenges with implementation of data governance frameworks?

3. What has been your experience overcoming the challenges with implementation of data governance frameworks?
4. What strategies do you use to gain knowledge about current IT infrastructure?
5. What strategies do you use to gain knowledge about data risk associated with data usage?
6. How would you describe the data governance framework in your organization?
7. How do you assess the effectiveness of strategies for implementation of the data governance framework in your organization?
8. What strategies do you use to reduce operational costs?
9. What strategies do you use to reduce operational risks?
10. What additional information can you add that would be valuable for identifying the strategies you have used to implement the data governance framework in your organization?

Conceptual Framework

I used servant leadership as the conceptual framework for my study. Servant leadership is a leader-centric approach. Greenleaf (1977) developed servant leadership theory. A servant leader is someone who chooses to serve others first, making a conscious decision to lead with a focus on caring for others (Greenleaf, 1977). Greenleaf conceptualized the servant leadership concept in which leaders placed employees, the customer, and their community as the priority. Servant leaders ensure that the priority is on those being served, ensuring that their followers become healthier, wiser, more

autonomous, more innovative, and more likely to become servant leaders themselves (Greenleaf, 1977). Servant leaders are capable of leading through establishing and expressing goals while ensuring that the goal is verbalized with a sense of certainty and purpose (Greenleaf, 1977). Effective leadership can aid in shaping an organizational culture for successful implementation of a data governance framework (Dahlberg & Nokkala, 2015). Servant leaders can help promote organizational agendas among other divisions and encourage a healthy organization philosophy (Greenleaf, 1977). Healthy organizational culture is a critical component of a successful data governance framework (Korhonen, Melleri, Hiekkanen, & Helenius, 2013). I used the servant leadership framework to examine how leader influence can contribute to the success or failure of implementing data governance frameworks to reduce operational costs and risks.

Operational Definitions

Completeness: Completeness of data means that necessary data are available in application systems for business needs (Dahlberg & Nokkala, 2015). For risk and regulatory reports, completeness means that necessary data are available in application systems to generate reports (Dahlberg & Nokkala, 2015). Completeness is a major component of risk and regulatory report generation (Dahlberg & Nokkala, 2015).

Data accuracy: Data accuracy is an element of quality of the data (Kerle, 2015). Data accuracy refers to a correct value of an object stored in application systems (Kerle, 2015). Data accuracy is assessed by the degree of conformity of a measure to a predefined confidence standard or another body of reference (Kerle, 2015).

Data breach: Data breach refers to unauthorized access and/or use of data from a stolen device such as mobile phones or laptop computers, and/or unauthorized access to application systems (Sen & Borle, 2015). A data breach can occur with data stored in an application system while data are in transit.

Data control: Data controls are components of quality measures (Bahalkar & Ramamoorthy, 2016). Data controls can help discover data errors (Bahalkar & Ramamoorthy, 2016). A successful data control provides validation of the data (Bahalkar & Ramamoorthy, 2016).

Data elements: Data elements are units of data that reside in an application system (Hamdeni, Hamrouni, & Charrada, 2016). Data elements include account numbers, names, addresses, and date of birth of customers. Data elements can be simple yes or no values of the data.

Data governance: Data governance is a group of processes that ensures that important data assets are formally managed throughout the enterprise (Sarsfield, 2009). Data governance means that data can be trusted and people can be made responsible for anything that happens to data due to poor data quality (Sarsfield, 2009).

Technical metadata: Technical metadata are technical elements of the data (Trofimov, Szumilo, & Wiegelmann, 2016). Technical elements include column names, column lengths, table names, data types, and database names. Technical metadata can include database and application server access paths (Trofimov et al., 2016).

Uniqueness: Uniqueness of data means no duplicate values of data should exist in the application system for a single value (Havens, Anderson, & Wagner, 2015). Each

record should be unique. An example is the uniqueness of a person's Social Security number.

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are claims that are considered to be true by the researcher but are not verifiable (Simon, 2011). Assumptions are relevant research-related assertions that can not be verified (Posthumus, Bozer, & Santora, 2016). The first assumption was that participants had a genuine interest in participating in a data governance frameworks study. The second assumption was that participants would provide honest and truthful responses to the interview questions. The third assumption was that readers of the research, specifically corporate data managers in other banks, would be able to understand the body of knowledge on data governance frameworks that I presented in this research.

Limitations

Limitations are potential weaknesses that could minimize opportunities for the research (Park & Park, 2016; Wymer & Polonsky, 2015). The first limitation was that study participants might have had restrictions on sharing confidential information that could have been beneficial for the study. The second limitation was the use of the multiple case study approach; with this approach I focused on the knowledge of selected subject matter experts. Findings are not generalizable beyond the limited population.

Delimitations

Delimitations are boundaries that the researcher has set for the study (Paun, 2014; Singh, 2015). The major delimitation of the study was that I focused on banks in North Carolina and New York. The study also included only data managers who had implemented strategies for data governance frameworks to reduce operational risks and costs. The use of a qualitative multiple study approach was limited to gathering information from corporate data managers at three banks. Organizations other than banks such as consulting or brokerage firms that could have provided additional knowledge on the topic were not a part of the study.

Significance of the Study

Understanding data governance frameworks could contribute positively to business practice and effect positive social change. Using effective data governance frameworks can help financial institutions understand and implement new IT system frameworks to strengthen the financial institutions (Kerle, 2015). Results from the study may be used by corporate data managers to design and implement operational improvement opportunities for enhancing data management practices.

Contribution to Business Practice

Data have a critical role in banking operations and in complying with regulatory requirements (Chakravorty, 2015). Banking operations depend on accuracy and reliability of data (Prorokowski & Prorokowski, 2015; Sipes, James, & Zetoony, 2016). Operational failures can adversely affect a bank's financial performance through reduction in stock prices, increase in operational costs and risks, and higher capital requirements mandated

by government regulatory agencies (Chakravorty, 2015; Prorokowski & Prorokowski, 2015). The results of this study may assist corporate bank managers in identifying effective business practices to consolidate application systems to reduce operational costs and risks. Lower operational risks may reduce the capital requirements and provide banks with opportunities to lend money to new ventures and households (Chakravorty, 2015; Prorokowski & Prorokowski, 2015).

Implications for Social Change

Banks are important to the economy as they act as intermediaries between savers and borrowers (Hirsch, Laschewski, & Schoen, 2016). The proper functioning of banks is important for a stable economy because of monetary transactions (Chakravorty, 2015). Bank application systems contain critical information such as names, addresses, Social Security numbers, and tax identification numbers for retail and business customers (Shirodkar, 2015). Data breaches, unreliability of data, and misuse of the data have increased in the last five years (Silverman, 2015). After review of the study's outcomes, IT professionals may be compelled to improve consumer data security and data reliability through robust IT infrastructure security enhancements. Implementation of a robust IT infrastructure may result in lower operational costs and risks, and with additional capital on hand banks may invest in the local economy.

Review of the Literature

The complexity of the IT infrastructure in the banking industry is high due to the variety of application systems used to conduct daily operations (Grody & Hughes, 2016). The complexity of the system infrastructure increases with large banks, especially G-

SIBs, because larger banks use an even larger variety of application systems (Chakravorty, 2015). Failure of any G-SIBs member bank could create a negative impact on a domestic or international economy. The Federal Reserve mandated the BCBS regulation 239 in 2013, which required all G-SIBs to establish a robust risk data governance framework to manage the risk and regulatory data that contributes to reports (Chakravorty, 2015). The concept of a data governance framework is somewhat abstract and refers to the ability of systems to generate usable, accurate, and efficient data for use by large banks. For ease of use, however, researchers have broken these frameworks down into specific components that are easier to measure. Al-Ruithe, Benkhelifa, and Hameed (2016) and Chakravorty (2015) stated that data governance frameworks consist of robust data design, data reliability, data accuracy, data speed, and data security. Smallwood (2014) stated that data governance frameworks consist of data office, risk management, and change management. Putro, Surendro, and Herbert (2016) found that effective leadership plays a crucial role in promoting data governance frameworks to protect data assets. There is a high demand for reliability, speed, accuracy, and security of data in banks, but among them are risk and cost reduction (Siddiqa et al., 2016; White, Hewitt, & Kruck, 2013). Banks rely on accurate data for daily operations. Because data are managed and stored across many applications and manipulated through manual processes, which increases operational risks and costs (Kerle, 2015), Chakravorty (2015) and Grody and Hughes (2016) advocated for the need to effectuate data governance frameworks. However, there were no recommendations on strategic initiatives for

implementation that could be used to implement data governance frameworks in financial institutions and reduce operational costs and risks.

Corporate data managers in banks find a high level of complexity involved in implementing a risk data governance framework in their organizations due to complexity in the IT infrastructure (Grody & Hughes, 2016). According to Chakravorty (2015), 67% of members of the G-SIBs responded that a future redesign of IT infrastructure was required. Many corporate data managers have been negatively affected by a high level of IT infrastructure complexity, which results in high operational costs and risks. Furthermore, these managers lacked effective strategies for implementing and integrating data governance frameworks. The current study was conducted to fill that gap in knowledge and give corporate data managers the tools they need to implement these programs effectively.

I reviewed the relevant literature, beginning with a discussion of servant leadership theory and alternative leadership theories. The alternative leadership theories include transformational, transactional, and behavioral leadership. The review of the literature includes analysis of data governance in relation to IT infrastructure, data security, role of data, data governance office, risk management, change management, and potential themes. Servant leadership theory is discussed in relation to the components of data governance frameworks. Managing data to comply with the outlined principles is complicated. After describing the organizational characteristics of leadership and how they impact the effectiveness of implementation of a data governance framework, I

address the specific components of a data governance framework and their relation to the servant leadership theory.

Search Strategy

I searched the literature on data governance frameworks, the conceptual framework of servant leadership theory, and alternative leadership theories including transformational, transactional, and behavioral leadership. I gathered scholarly literature from Business Market Research Collection, Business Source Complete, Computers and Applied Sciences Complete, Computing Database, Emerald Insight, ERIC, ProQuest, and SAGE Journals databases. In addition, I used Walden University's library to gather peer-reviewed scholarly literature, and I used full text, peer-reviewed scholarly journals, and academic journals in the search criteria. I employed the following key words in the searches: *servant leadership, transformational leadership, transactional leadership, behavioral leadership, data governance, data governance* and *leadership, data office, BCBS 239, data management, financial industry* and *data, financial industry* and *regulations, data breaches, data security, data risk, data risk management, change management* and *leadership, implementation of data governance, data stewards, data process, report stewards, technology testing, software development life cycle, operational risk,* and *operational cost*. I gathered information from 117 resources for the literature review; 102 (87%) of the resources were peer-reviewed articles published between 2016 and 2018. I included five (4%) seminal books on data governance frameworks and leadership theories, two (1%) government publications, and one (1%) private publication from IBM published in 2017.

Servant Leadership Theory

Servant leadership theory provided the conceptual foundation for this study. Greenleaf (1977) defined a servant leader as a leader who chooses to serve first, making a conscious decision to lead with a focus on caring for others. Greenleaf stated that any transformation within any organization or institution, no matter its size, with the aim of raising the serving quality starts with one individual's initiative regardless of the significance of the movement. Greenleaf introduced a new form of leadership in which leaders placed employees, the customer, and their community as the priority. Servant leaders ensure that the emphasis is on those being served, ensuring that followers become healthier, wiser, more self-directed, and more likely to become servant leaders themselves (Greenleaf, 1977).

Greenleaf (1977) stated there should be more servant leaders and that those not in leadership positions should follow only servant leaders. The popular choice for most leaders is traditional leadership styles or to go along with the current system (Greenleaf, 1977). The idea of more servant leaders and followers accepting only servant leaders was an unacceptable idea among leadership theorists (Greenleaf, 1977). However, the success of servant leadership has made it more widely accepted, and it is now being researched.

Several aspects of servant leadership are different from traditional leadership models. Greenleaf (1977) stipulated that the roles assumed by leaders can be given, assumed, and taken away, but the nature of a servant leader cannot be given, assumed, or taken away. The demeanor of a servant leader provides that change can take place between the leader and the led, as the led willingly follow leaders who are proven and

trusted servant leaders (Greenleaf, 1977). Parris and Peachey (2013) stated that instead of developing a definition for servant leadership, it was often presented as a list of leader attributes and follower antecedent traits. Greenleaf's vision of servant leadership includes a lifetime of changing, learning, and growth that is continuous and evolving rather than arriving (Parris & Peachey, 2013). Van Dierendonck, Stam, Boersma, De Windt, and Alkema (2014) added that even though influence is often considered a main aspect of leadership, servant leadership focuses on the ideal of service instead of influence in the leader-follower relationship.

There are other definitions of servant leadership than the framework provided by Greenleaf. Several overlapping aspects exist in the literature, yet further research is needed to narrow the broad definition of servant leadership (Liden, Wayne, Liao, & Meuser, 2014). Parris and Peachey (2013) conducted a systematic review of the empirical literature on servant leadership and concluded that there was no consensus on how to define servant leadership. Adams, Salina, and Eppinga (2016) stipulated that servant leadership theory was being studied across various cultures, contexts, and themes, and researchers were using several measures to investigate servant leadership. Servant leadership was found to be a viable theory for leadership that helped organizations' growth and improved followers' well-being (Panaccio, Henderson, Liden, Wayne, & Cao, 2015). Parris and Peachey (2013) provided numerous descriptions of servant leadership behaviors that included active listening, empathy, humility, selflessness, patience, calm, and charisma.

Musgrave (2014) noted that a servant leader focuses on the highest priorities of others while persevering and adjusting his or her hypotheses of the needs of followers. According to Parris and Peachey (2013), servant leaders serve others by focusing on helping those they lead to succeed. According to Jaramillo, Bande, and Varela (2015), goal setting and the inspiration and guidance on how to achieve the goal are behavior characteristics of a servant leader. Servant leaders can guide team members to improve the performance and productivity through training and mentorship (Jaramillo et al., 2015). Greenleaf (1977) explained that a servant leader has characteristics to identify followers' behavior, and a servant leader can help followers to build confidence to accomplish challenging goals. The true servant leader is one who continues to serve even if the results from his or her efforts are delayed or unknown (Van Dierendonck et al., 2014).

Jaramillo et al. (2015) asserted that servant leaders are excellent communicators. Greenleaf (1977) argued that the act of listening allows followers to gain confidence in servant leaders. According to Jaramillo et al. (2015), the process of listening begins with understanding that the first response to a communication is always the first time listening to what is being said and not said. A manager is responsible for managing a project and mitigating risks associated with the project, and effective communication skills are vital for success (Bashir & Azam, 2016). Adams et al. (2016) noted that servant leaders demonstrating a desire to understand what is being communicated to them from their followers earn trust and confidence and ensure that no misunderstandings occur, which may cost the organization valuable time. Coetzer, Bussin, and Geldenhuys (2017) stated

that a manager could work with a leader to mitigate a resource constraint issue by bringing additional resources or expanding the timeline to finish the project. A leader, on the other hand, can make a strategic decision of bringing in additional resources rather than expanding the timeline to complete the project. Leaders encourage team members through influential discussions and think outside the box for innovative solutions. The ability of servant leaders to use encouraging language and imagination can inspire others to take a leap of imagination (Greenleaf, 1977).

Servant leaders express humility by putting others' well-being and the main objective of the organization ahead of their personal needs and desires. Greenleaf (1977) argued that the main difference between those who choose to serve and those who choose to lead may be in their desire to achieve power or material possessions. According to Liden et al. (2014), when the primary behavior of a leader is based on servant leadership, the leaders most capable of motivating followers are those who focus least on satisfying their personal needs and most on prioritizing the fulfillment of their follower's needs. Coetzer et al. (2017) argued that leaders who focus on the needs of people display the characteristics of servant leaders. The servant leader builds this trust through the confidence gained by having values, demonstrating competence, and having a sustaining spirit in pursuit of a goal (Greenleaf, 1977). Jaramillo et al. (2015) observed that when top leaders demonstrate servant leadership attributes, the organizational culture is transformed into a serving culture. The role of leadership in shaping organizational culture is crucial in implementing data governance frameworks because it requires

collaboration among many business units and external regulating entities (Smallwood, 2014).

Parris and Peachey (2013) noted that servant leaders exhibit a talent to gain trust despite undertaking high-risk tasks and can effectively communicate with those being served. Greenleaf (1977) stated that servant leaders inspire others by providing direction, inspiration, and community, even as the servant leaders face the possibility of success or failure with those whom they lead. Jaramillo et al. (2015) noted that servant leaders could help shape an organizational culture that can promote diversity and acquire talent that thrives in a diverse work environment. Servant leaders pay close attention to personal and professional goals of their followers and provide guidance toward the achievement of goals (Focht & Ponton, 2015). As a result, followers feel a special bond with leaders (Jaramillo et al., 2015). Parris and Peachey (2013) stated that servant leaders empower their followers through mentorship and training to reach their potential and promote ethical behavior.

According to Musgrave (2014), servant leaders are capable of leading by establishing and articulating goals with a sense of certainty and purpose. Smallwood (2014) noted that effective leaders can help shape an organizational culture for successful implementation and integration of data governance frameworks. Liden et al. (2014) stated that a serving culture is characterized as a work environment in which participants share the understanding that the behavioral norms and expectations are to prioritize the needs of others above their own and to provide help and support to others. Doh and Quigley (2014) argued that although management and leadership are conceptually different,

leaders are often managers and vice versa. Managers and leaders work with their teams to achieve organizational goals (Adams et al., 2016). Doh and Quigley stated that managers are task oriented and focus on reducing risk, managing daily work activities, and executing solutions. According to Musgrave (2014), servant leaders are strategy oriented; servant leaders focus on inspiring the team, modeling the culture, and taking risks on new initiatives. Greenleaf (1977) stated that servant leaders create excitement about the goal while sparking the imagination and challenging people to work toward accomplishing the goal with pride and a willingness to learn strategies for successful goal attainment.

It is important to note that there are discrepancies in the literature regarding the definition of servant leadership. According to Dinh et al. (2014), the eight characteristics of servant leadership include empowerment, standing back, accountability, forgiveness, courage, authenticity, humility, and stewardship. According to Liden et al. (2014), there are seven dimensions of servant leadership that contribute to cultural transformation: emotional healing, conceptual skills, generating value for the community, empowering, putting followers first, helping followers, and behaving ethically. According to Bashir and Azam (2016), three characteristics of servant leadership include reliability, worker perception of and trust in the leader, and authenticity. Servant leaders have the ability to listen to employees, promote emotional healing, and express empathy (Focht & Ponton, 2015). Dinh et al. stated that servant leaders possess specific attributes that include being helpful, having concern for followers, and encouraging followers to become servant leaders. Even though none of the descriptions of servant leadership has been chosen as an

empirically validated definition, none of these definitions are wrong and all of them are related to Greenleaf's initial theory.

Doh and Quigley (2014) argued that servant leadership consists of a leader being there for team members when they need guidance and encouragement in critical or noncritical situations. Focht and Ponton (2015) posited that leaders should place emphasis on the needs of workers to ensure that the demands of the organization are met. Implementation of data governance frameworks consists of dealing with various levels of leaders in many divisions of an organization and implementation of new policies and procedures (Smallwood, 2014). Panaccio et al. (2015) stated when dealing with many leaders, issues tend to arise due to the difference in opinions. Focht and Ponton (2015) specified that servant leaders possess qualities that help them understand the perception of others and this skill can help resolve discrepancies. Smallwood (2014) stated that difference of opinion is common when a new process is implemented. Therefore, implementation teams who effectuate the framework require strong servant leaders who can help resolve implementation issues.

Focht and Ponton (2015) argued that the lack of acknowledgment and awareness of the needs of employees decrease employee job satisfaction and increases employee attrition rates. The practice of servant leadership could help to unite workers within the organization. Doh and Quigley (2014) stated that servant leaders are essential to creating productive teams in which collaboration among many teams is desirable.

Based on the critical analysis above, it is clear that servant leaders can encourage a healthy organization philosophy by reducing the stress, promote change, and develop

thought leaders to promote and implement organizational agenda of data governance frameworks. Servant leaders can help their followers and organizations to achieve goals and can also help their followers to create productive business relations among different teams (Jaramillo et al., 2015; Parris & Peachey, 2013). Data governance framework requires dealing with many teams, and this can create stressful situations. Servant leaders can help promote organizational agenda among other divisions, and this process can contribute to achieving awareness that can help reducing organizational stress (Adams et al., 2016; Greenleaf, 1977). According to Smallwood (2014), a healthy organizational culture that welcomes change is a critical component of a successful data governance framework. In the following sections, I analyzed and discussed alternative leadership theories of transformational, transactional, and behavioral leadership.

Transformational Leadership

Burns (1978) conceptualized transformational leadership, and it was later amended by Bass (1985) and others (Bass, Avolio, Jung, & Berson, 2003; Karakitapoglu-Aygun & Gumusluoglu, 2013; Sahin, Çubuk, & Uslu, 2014). According to Burns (1978), transformational leadership has a greater foundation than only the obedience of followers. Transformational leadership relies on a mutual relationship of elevation and stimulation, which leads to the conversion of followers to become leaders themselves, and even to be moral agents (Burns, 1978). Furthermore, transformational leadership also stems from the personal beliefs and values of the individual, not from an exchange of services between followers and their leaders (Burns, 1978). The beliefs and values of transformational leaders include values such as integrity and justice (Burns, 1978). Transformational

leaders unite their followers and influence them to change their beliefs and goals, by exerting their personal value system (Burns, 1978). According to Bass et al. (2003), transformational leadership is a style of leadership where leaders and followers raise each other to a higher platform of values, motivation, and morality. Karakitapoglu-Aygun and Gumusluoglu (2013) stated that transformational leaders tempt people to achieve outstanding outcomes. Leaders, who possess a transformational leadership style, use inspiration and empathy to engage followers. Burns (1978) focused on motivation and values. According to Burns (1978), this way of leadership results in an enormous change in the lives of workers and the success of organizations. Sun, Xu, and Shang (2014) pointed that transformational leadership leads to altering the values, perceptions, expectations, and desires of followers. Sun et al. (2014) stated that leaders who follow transformational leadership demonstrated virtuous epitome towards the sake of the team, organization, and community.

Chan and Mak (2014) asserted that transformational leadership depends on the character and capacity of the leader to influence a change because of articulating a rousing vision and objectives brimming with vitality. In a similar way, Zwingmann et al. (2014) argued that the key thought fortifying the transformational leadership model is the impression that transformational leaders change the qualities, convictions, standards, and mentalities of followers in such a way they are prepared to perform at a high level with minimal levels of supervision. In a similar vein, Effelsberg, Solga, and Gurt (2014) stated that transformational leadership is moving and centered on the possibility that leaders can change follower's convictions, thinking, beliefs, and behavioral inclinations in a positive

way. According to Sahin et al. (2014), leaders can help set goals for their teams and inspire team members to attain desired results beyond their self-interest. Leaders can influence their teams to mitigate issues during a critical situation (Chia-Huei & Zhen, 2015). Zwingmann et al. (2014) stated that leaders could guide the team members to solve difficult business problems and help achieve organizational goals. Chia-Huei and Zhen (2015) proposed leaders should encourage open communication to promote a mutual dialogue to resolve issues. Similarly, Chan and Mak (2014) asserted that interactive dialogue could foster innovative solutions to business problems.

Chan and Mak (2014) argued that the transformational approach to leadership demonstrates an engaging activity between the leader and the follower, and workers feel content working under leaders who display more transformational organization characteristics. As shown by Chia-Huei and Zhen (2015), the transformational leadership idea altogether influences distinctive parts of the organizational experience, and furthermore on the spirituality of the workers. Sustaining Chan and Mak (2014) disclosures on the transformational expert, Sun et al. (2014) agreed that leaders indicating transformational behaviors are convincing, inspirational, influencing, intellectually stimulating, and outstandingly courageous. Zwingmann et al. (2014) stated that leader support through open communication could help team members feel connected to leaders and organizational goals. Chia-Huei and Zhen (2015) stated that open communication can assist in achieving optimal results under strict deadlines and evolving work environments, especially during crisis because open communication can promote interactive dialogue, and team members do not feel intimidated. Sun et al. asserted that through the

transformational leadership approach, leaders could encourage team members to work in a structured manner to accomplish organizational goals.

Bass (1985) changed Burns's (1978) transforming leadership approach, and over time, four extensions of transformational leadership evolved. According to Karakitapoglu-Aygun and Gumusluoglu (2013), the four dimensions include (a) inspirational motivation, (b) idealized influence (c) intellectual stimulation, and (d) individualized consideration. According to Sahin et al. (2014), five extents of the transformational leader comprise (a) idealized effect attributed to the leader by workers, (b) idealized influence credited to the leader's behavior, (c) intellectual stimulation, (d) moving motivation, and (e) individualized idea. As stipulated by Groves (2014), when these practices exist, workers most likely are satisfied and ultimately perform beyond the normal expectations. Groves (2014) argued that a transformational leader demonstrates each one of these five dimensions to influence followers to achieve organizational goals.

Effelsberg et al. (2014) and Groves (2014) argued that transformational leaders influence organizational performance by transforming follower's convictions through behavioral change, Rowold (2014) and Yukl (1989) have criticized this argument. For instance, Yukl stated that the essential instrument of transformational leadership affect at work speculation is undefined. Yukl argued that the transformational leadership idea lacked required identification of the impact of context variables on leadership effectiveness. In addition to this argument, Rowold and Yukl have condemned the scholarly slant to conflate the forms of idealized influence and motivation as pointless.

Chia-Huei and Zhen (2015) stated that a leader could inspire team members beyond their self-interests for a superior accomplishment through intellectual stimulation in the transformational leadership approach. Chan and Mak (2014) asserted that leaders use a transformational approach to place emphasis on team member's growth that can lead towards innovation and productivity. Groves (2014) stated that intellectual stimulation could improve the morale of team members.

To summarize, transformational leaders possess integrity and enormous emotional intelligence. Effective transformational leaders can influence followers through intellectual dialogs and promote a positive atmosphere in the organization. However, transformational leaders may fall into the trap of depending excessively on enthusiasm and feeling that they would tend to neglect reality and truth (Chia-Huei & Zhen, 2015). Therefore, transformational leadership theory was not an appropriate framework for my study.

Transactional Leadership

Burns (1978) developed the transactional leadership approach that is a task and result based approach. Burns stated that leaders use this approach where workers need to work in a structured organizational environment. Workers follow strict guidelines and do what their leaders instruct them to do. For instance, military combat missions and first responder organizations widely use transactional leadership approaches. Similar to Burns, Caillier and Sa (2017) found that in transactional leadership approach workers follow predefined procedures. Bass (1985) argued that a transactional leadership approach is effective in an organization where job functions are repetitive. Bass stated that both

leaders and followers mutually benefit through a task completion and reward approach. According to Caillier and Sa (2017), transactional leaders provide clear directions to followers related to job functions, and accurate directions reduce task-related mistakes. A similar argument presented by Afsar, Badir, Saeed, and Hafeez (2017) stated that transactional leaders focus on accurate results and emphases on procedures to complete job functions.

According to Francis (2017), the transactional leadership approach does not focus on the motivation and followers can feel discouraged. Francis (2017) argued that tasks achieved through procedures discourage innovation and creativity. Followers led by transactional leaders emphasis specifically on task completion and associated rewards (Francis, 2017). According to Caillier and Sa (2017), rewards and penalties are predefined by transactional leaders. Francis argued that above method might not be useful, as followers may fear of negative impact for unintentional mistakes. Afsar et al. (2017) and Francis argued that transactional leadership is a task-oriented approach that focuses on short-term goals. Khattak, Batool, and Haider (2017) stated that follower performance is a crucial measurement factor for both reward and punishment in a transactional approach.

Caillier and Sa (2017) stated that people showing transactional leadership capabilities urge followers to seek after own self-intrigue. Burns (1978) considered transactional leadership as a type of engagement amongst leaders and followers who take part in an arrangement of trades of satisfaction with the sole point of amplifying singular worker interests and additionally accomplishing arranged authoritative targets. As

indicated by Burns, transactional leadership flourished through quick essential exchanges between leaders and followers, who navigate from one exchange onto the next looking for gratification. As stated by Burns, such exchanging, at last, requires correspondence, adaptability, versatility, and cost optimization in real time.

To summarize, transactional leadership theory is not hard to critique as the theory focuses on tasks, rewards, and the quality of the completed tasks. Francis (2017) stipulated that transactional leadership focuses strictly on task completion approach and lacks the ability to promote creativity and innovation. The transactional leadership theory assumes that worker's motivation depends on reward and punishment. According to Khattak et al. (2017) the transactional theory assumes that followers must follow predefined directions developed by leaders to achieve desired results. Francis argued that transactional leadership could be used for exploitation. Further, the transactional leadership style of leadership has not proven the most effective leadership method in conditions where change is desired (Afsar et al., 2017). Transactional leadership does not cultivate employees as it does not bring out the best in employees but subjugates them with power (Francis, 2017). Above analysis concluded that transactional leadership is useful in a repetitive task-oriented environment and focuses on short-term goals. Therefore, transactional leadership theory was not an appropriate framework for my study.

Behavioral Leadership

Stogdill (1948) developed the behavioral approach in the late 1940s, and later Blake and Mouton (1964) explored the approach in the organizational setting. According

to Stogdill (1974), the behavioral approach emphasizes the behavior of a leader. The behavioral approach consists of two types of behaviors: task and relationship behavior (Stogdill, 1974). Blake and Mouton (1964) stated that both task and relationship behaviors lead to success because every organizational environment can be different and a leader may need to use a task approach in one situation and a relationship approach in another. For instance, some followers seek guidance from leaders based on a specific task and other may seek nurturance from leaders (Makkonen, Johnston, & Javalgi, 2016).

Reams (2017) and Stogdill (1974) argued that behavioral approach is an essential and practical leadership approach to achieve success through task and relationship assessment of followers. According to Qi and Hua (2017), leaders can use a task behavior approach to assist organizational objectives; in a task behavior approach, a leader can describe and arrange tasks for teams. Makkonen et al. (2016) argued that in a controlled organizational environment, a task behavior approach is essential to supervise activities on a task-by-task basis for a complex project.

Reams (2017) argued that relationship behavior emphasizes the encouragement of team members through a relationship approach. According to Qi and Hua (2017), a leader can assess the willingness of a follower through this approach and based on the assessment, the leader can provide appropriate guidance to the follower. In a similar argument, Blake and Mouton (1964) stated that leaders should analyze needs of their followers and assess which approach can help followers to achieve success and to promote a functional organizational environment.

According to Makkonen et al. (2016), success and failure depends on the leader's behavior. Leaders who possess destructive behavior produce negative outcome, reduce productivity, have an adverse effect on the reputation of a company, and de-motivate followers (Makkonen et al., 2016). In contrast, Qi and Hua (2017) argued that positive influential leader behavior has a constructive effect on followers and positive behavior achieves results through task and relationship behavior. According to Jones and Jones (2014), the success of the behavioral approach merely depends on the behavior of a leader. Therefore, the burden is on the leader. Waldman, Danni, Hannah, and Balthazard (2017) argued that behavioral leadership does not contribute to the development of self-leaders.

The above analysis concluded that in behavioral leadership approach, followers tend to develop dependability on leaders for guidance and absence of leader can result in negative productivity. Makkonen et al. (2016) and Waldman et al. (2017) stipulated that the success of behavioral leadership depends on the behavior of a leader; behavioral leadership lacks the quality of development of self-leaders, and followers tend to depend on leaders for guidance. Therefore, behavioral leadership theory was not an appropriate framework for my study.

To conclude the analysis, servant leadership was discussed at large and then transformational, transactional, and behavioral approaches were analyzed as opposing leadership theories. I expanded on conceptual framework of servant leadership for my stud; this framework illustrates servant leaders are better suited for data governance frameworks implementation because servant leaders can not only promote an

organizational agenda through influence but also care about the goals of their followers. Dinh et al. (2014) conducted a qualitative multiple study on effectiveness of servant leadership and Focht and Ponton (2015) conduced a Delphi study to identify principal characteristics of the phenomenon of servant leadership; both studies found that teams led by servant leaders have proven to show empathy towards each other and achieve success through teamwork. Bashir and Azam (2016) stipulated that servant leaders support teams that value teamwork and collaboration. As the above discussion illustrates, there are multiple approaches to leadership in an organization. Any of the discussed styles may be effective in a given organization, and their effectiveness depends on specific needs of the organizational culture. One consistent finding in this research is that effective leadership is a key attribute of a successful implementation strategy and should be taken into consideration for a change management plan. Adams et al. (2016) and Greenleaf (1977) stipulated that servant leadership evidenced leading through influence, collaboration, empathy, and caring for their followers. Therefore, I chose to conceptualize my study using servant leadership theory. The following discussion argued critical analysis of data governance framework and why servant leadership may be the appropriate approach to achieve success in data governance frameworks implementation.

Data Governance Frameworks in Relation to Servant Leadership Theory

In this subsection, I discussed components of data governance framework and the role of servant leadership. Putro et al. (2016) conducted a case study to explore role of leaders to promote data governance frameworks to protect data assets. Data are vital assets to a company in the digital era. Putro et al. described data governance to be a

process used by an organization to manage the consistency, quality, security, usability, as well as the availability of the organization's data, and added that it was a critical topic that should be addressed with urgency. Prorokowski and Prorokowski (2015) conducted a qualitative multiple study utilizing 29 financial institutes in Asia, North America, and Europe. Prorokowski and Prorokowski found that data governance frameworks are required not only to protect data assets but also to comply with BCBS 239 compliance. Sankaran and Ahmed (2016) stipulated that digitalization was changing the current business models for all industries with the increased dependency on information technology. IT leadership should support the organization while serving the changing needs of customers' (Sankaran, & Ahmed, 2016). A robust data design consists of both effective architectures of application systems and business processes through optimal organizational leadership approaches (Tihanyi, Graffin, & George, 2015) that serve the organization and its customer base.

The organization of a data governance initiative encompasses several factors for successful implementation. Fernandes, O'Connor, and Weaver (2012) stated that a data governance framework should consist of the basic precepts of process, policies, and people, specifically data stewards. According to Fernandes et al. (2012), data stewards play a very specific role in improving data quality through data monitoring and should be included to assist with interpreting data quality issues. Smallwood (2014) posited that a data governance council is also recommended to represent key stakeholders throughout the organization. Specific attention should be paid to newly implemented inferences, automated processes, data metrics, as well as monitoring tools (Tihanyi et al., 2015).

Furthermore, new procedures and policies are needed to govern data usage, and processes regarding actions and quality control should be defined in order to secure, optimize, as well as leverage data as an organizational asset through the alignment of data governance objectives (Fernandes et al., 2012).

Along with organizational change, including new data governance procedures or implementation, comes resistance. Ladley (2012) cautioned that when involved in activities regarding the vision of an organization, resistance to data governance should be expected. Furthermore, according to Ladley, three outcomes are imminent when presenting the data governance framework on an executive level:

1. The executives will instruct lower-level employees to deal with the changes since they will be occupied with important activities.
2. The organization's representatives or sponsors will become doubtful when they need to educate other employees in higher ranks and dilute the information.
3. Executive personnel will sit through the presentation, not convinced, ask some questions, and not take it seriously.

Ladley (2012) added that all three of these outcomes represented a lack of understanding and leadership, beckoning the need for sound leadership approaches. Experience with data governance indicated that intense resistance often has a close relation to organizations with ineffective business alignment (Ladley, 2012). Smallwood (2014) suggested that reinforcement and repeated training would decrease resistance.

Servant leadership approaches can help guide and shape organizational culture (Doh & Quigley, 2014), which affects the implementation effectiveness of data governance frameworks (Korhonen et al., 2013). A critical component of data governance frameworks is working with multiple teams, and effective leadership plays an essential role in the successful management of those teams (Korhonen et al., 2013). According to Cai (2014), organizations are made of multiple divisions, and each division can have its norms. For this reason, leaders in each division should customize an approach that fits well with the organizational norms (Cai, 2014). Korhonen et al. (2013) found that implementation teams that employ the framework require strong leaders who can help their teams to resolve implementation issues. Doh & Quigley (2014) and Jaramillo et al. (2015) stipulated that servant leaders are essential to creating productive teams when collaboration among many teams is desirable. Korhonen et al. (2013) stated that the key characteristics of a successful and productive chief steward included strong leadership and team-building skills, as well as effective communication. The researchers added that a chief steward has to ensure that data stewards are implementing the data governance decisions that were agreed on, and they are working, as well as aiding in any challenges that arise (Korhonen et al., 2013). Smallwood (2014) posited that a chief steward should effectively communicate with technology and business leaders in order to close the gap between IT and business and resolve any data governance issues efficiently. Lastly, for chief stewards to be successful, it is required that they show respect across the organization and acts as a builders of consensus (Smallwood, 2014).

Information Technology Infrastructure

Arsenyan and Buyukozkan (2016) conducted a mixed method study to explore strategies to optimize technological infrastructure. They found that technology infrastructure enhancements are critical to achieve competitive advantage. Arsenyan and Buyukozkan, and Renger, McPherson, Kontz-Bartels, and Becker (2016) stated that a systematic methodology is critical in the planning phase to upgrade information technology infrastructure and lack of systematic methodology can lead to poor architecture of application systems. According to Chakravorty (2015), poor architecture of application systems leads to the complexity involved in understanding current IT infrastructure as well as system failures, and poor architecture of application systems increases the cost of IT operations. Shirodkar (2015) asserted that poor infrastructure of business processes ties to the poor architecture of application systems and weak leadership; the poor architecture of application systems can be due to fewer capabilities of system functions. Arsenyan and Buyukozkan (2016) and Chen, Li, and Wang (2015) stated that a simplified data infrastructure creates far less overhead cost compared to multiyear add-on application systems' functionality that creates complex IT infrastructure. Korhonen et al. (2013) asserted that a lack of effective leadership leads to inefficient IT data management practices. Doh and Quigley (2014) stated that servant leaders are selfless and they can promote ethical behavior through encouragement and positive influence. Therefore, a strong servant leader that is committed to improving business processes is can minimize redundant business and IT processes.

Data governance encompasses an extensive process with several interlinking processes. Riggins and Klamm (2017) stipulated that a variety of IT-related governances had been mentioned, which also included data governance, IT governance, analytics governance, as well as information governance. Every one of the mentioned governances has different aims, yet share several characteristics such as a well-stipulated plan and effective leadership for implementation (Riggins & Klamm, 2017). Ladley (2012) asserted that data governance is a fundamental aspect of total enterprise governance, and encompasses the leadership as well as the organizational processes and structures that ensure an organization's IT sustenance and extends its objectives and strategies. Korhonen et al. (2013) stipulated that poorly developed and planned data governance can be the core cause for the lack new project development as well as a loss of competitiveness. According to Riggins and Klamm, further research and empirical investigations of data governance are needed as the available research is still limited.

Technology enhancements. Gupta et al. (2016) conducted a qualitative case study to explore application system requirements including near real-time data transmission and retrieval, data availability, reliability, and scalability for large data processing functionality. According to Clarke (2016) and Gupta et al., technology enhancements should include the latest application systems that support big data analysis and reporting capabilities. Virtual application systems can provide data cloud computing, and virtual application systems can reduce the overhead cost of maintenance of traditional application systems (Gharbaoui, Martini, Adami, Giordano, & Castoldi, 2016; Korpelainen & Kira, 2013). Virtual machine technologies, examples are, Windows

Hypervisor, VMware, and Xen, isolate computation on a shared cluster platform and can help data centers to compute high scale data effectively (Ma, Sheng, & Gu, 2014). Jin, Liu, Ji, and Liu (2016) conducted a qualitative case study and found that IT design should include four important components: significance, capacity, variation, and pace. Similar to Jin et al. (2016), Hou, Zhou, and Du (2016) conducted a qualitative multiple study and found that there is a relationship between the significance, capacity, variation, and pace. Because complex reporting structures in banks rely on strong application systems, four components above can help in the selection process of an effective IT infrastructure that supports data governance frameworks.

According to Putro et al. (2016), organizational change without effective leadership can lead to failures. Panaccio et al. (2015) asserted that strong leadership plays an important role in the success of organizational change. Implementation of new technology can create challenges for both technology and business teams. According to Bashir and Azam (2016), servant leaders can build corporate communities that welcome change. Change is critical for technological innovations to achieve optimization in the business processes. The community should consist of followers from both technology and business teams who share common goals and are committed to generating innovative IT solutions to business problems. Panaccio et al. stated that followers in the community are encouraged to share their ideas and understand perspectives of both business and technology challenges. In the community, each follower expresses personal views of common issues and seeks a mutual solution to business and technology problems (Bashir & Azam, 2016).

Data speed. Lu, Wu, and Wang (2016) conducted a quantitative study on technology infrastructure and data speed. The study found that optimized technology infrastructure design plays a critical role in high speed data transmission and to reduce system failures (Lu et al., 2016). According to Prorokowski and Prorokowski (2015) and Yasushi, Yuuki, and Tomonao (2016), data speed is crucial to generating risk and regulatory reports because these reports require large datasets. Date (2016) stated that banks specifically generate both risk and regulatory reports monthly and/or quarterly, depending on the nature of the reports. The time spent on each report can be significantly reduced with enhanced data speed that can contribute to saving time and cost (Yang et al., 2016). Gunther, Puglia, and Tomasette (2015) stated that application software such as Hadoop MapReduce is used to increase data speed in banks or other technology-driven organizations. Smallwood (2014) stipulated that a leader's approach is important during the adoption of new technologies. The meaning of empathy in the servant leadership approach is seeing and understanding the world from the perspective of a follower (Jaramillo et al., 2015). In the context of this study, it is a perspective of a data user in reference to data speed. Servant leaders can understand criticality and need of data speed from a data user perspective. According to Adams et al. (2016), when servant leaders showed empathy, it provided a confirmation and validity to followers that their leaders will provide support and guidance when the time arises. Servant leaders who possess the empathy characteristic can assess and understand the need of data speed capabilities and engage senior leaders to get their buy-in to implement innovative technologies to enhance data speed.

Data design. Data designers must consider protection of data and should restrict unauthorized use of data (Menon & Sarkar, 2016). Felici, Koulouris, and Pearson (2013) stated that accountability has recently been found to be a critical aspect related to the protection of data. Interestingly, accountability is also regarded as an aspect of servant leadership. According to Dinh et al. (2014), the eight-characteristics of servant leadership are empowerment, standing back, accountability, forgiveness, courage, authenticity, humility, and stewardship. Felici et al. (2013) emphasized that it is important to maintain links of accountability for entire cloud ecosystems to ensure and increase the confidence in the trust of cloud actors operating the cloud-based data. Those creating data design models should give special importance to storing and accessing data promptly (Merino, Caballero, Rivas, Serrano, & Piattini, 2016). Prompt accessibility of data are important for real-time decision-making processes (Pigni, Piccoli, & Watson, 2016). Robinson, Narayanan, Toh, and Pereira (2014) stipulated that accurate data processing capabilities of application systems are critical in making effective business decisions. Therefore, servant leaders can play a crucial role in technology infrastructure optimization by demonstrating the benefits of an optimum data infrastructure and its impact on business decisions through accountability, stewardship, and persuasion.

Marcinkowski and Fonseca (2016) conducted a qualitative case study on large volume IT data processing designs. The researchers found that considerations must be given to both hardware and software application requirements during the data infrastructure design phase to achieve efficiency in data processing. Big data analytics capabilities can help a company achieve a competitive advantage through providing an

accurate analysis of business data (Sanders, 2016). Inaccurately processed data can generate inaccurate reports, which in turn can have a negative effect on a company's reputation. According to Focht and Ponton (2015), awareness is a key characteristic of a servant leader. Awareness of what surrounds the environment of a servant leader and self-awareness make a servant leader a unique character for success (Focht & Ponton, 2015). Smallwood (2014) stipulated that lack of leadership awareness can lead to poor data management that can cause data integrity issues. Through awareness, servant leaders can educate themselves regarding the data integrity issues and influence followers to promote an organizational culture that fosters data accuracy and integrity.

According to Chen et al. (2016) and Lu et al. (2016), reliability and accuracy are other crucial aspects of a robust data design. Phan et al. (2016) and Sanders (2016) stated that the accuracy and reliability of data depends on the credibility of data origin, testing of data, and consistency of data from the source to the target stage of data. Poor reliability and inaccuracy of data reduce the credibility of data, and it contributes to poor business decisions (Gopi & Mastan, 2017). According to Stanley and Edwards (2016), understanding the purpose of reporting requirements can contribute to the reliability of data through proper sourcing of data. When there are two application systems where data stored, a data user should understand reporting requirements and source data from appropriate application systems as per reporting requirements. Lu et al. stated that uniqueness and completeness of the data can attest to the reliability of the data.

Reliability and accuracy of reporting data are crucial for business decisions, and foresight characteristic of a servant leader can play an important role in promoting and

predicting data reliability and accuracy. Foresight characteristic is a leader's ability to forecast future based on the past scenarios (Wong, 2016). For instance, based on previous experience, a leader can predict what kind of support may be needed during a complex technology implementation of a robust data design to support reliability and accuracy of reporting data. Adams et al. (2016) and Wong (2016) stated that the foresight ability can help reduce business problems because servant leaders can provide customized support based on the past scenarios. In addition, Servant leaders can promote data reliability and accuracy business practices through foresight characteristic and help teams understand the risk of inaccurate and unreliable data based on experiences.

System of origin, systems of record, and reporting system. According to Smallwood (2014), three important components in data management are a system of origin, a system of record, and reporting system. Diener, Cruz, Alves, Navaux, and Koren (2016) stated that a system of origin is defined as an application system in which users initially enter data. Examples of the system of origin include teller application system, a trading application system, and a loan application system.

Mark and Ultmann (2016) stated that a system of record is a system that keeps or stores data with or without transformations of data. As an example, a system of record can be a database, a data warehouse, a transformation application system, or cloud storage. A system of record can also be a desktop application such as Microsoft Excel and or Microsoft Access. Ye (2017) stated a transformation application system takes data feeds from internal or external application systems and runs data through transformation logic to process data. Internal application systems are those managed in an organization,

and external application systems are those managed by external organizations, such as a vendor application system (Diener et al., 2016; Hamdeni et al., 2016).

According to Chakravorty (2015) and Hamersky (2016), a reporting system is an application system that generates risk, regulatory, and or company board of director reports. A reporting system takes data feeds from internal and or external application systems and utilizes data to produce reports. A reporting system can do transformations of data for reporting purposes (Chakravorty, 2015; Smallwood, 2014). Mark and Ultmann (2016) stipulated that new rules and regulations can dictate changes to systems described above. It is a system owner's responsibility to ensure new changes are implemented to comply with new data transformation rules (Diener et al., 2016). Korhonen et al. (2013) argued that lack of a system owner's accountability skills can jeopardize system enhancements.

To summarize above analysis, data governance plays an important role in discovering and remediating issues in the information technology infrastructure. The analysis above discovered that dated technology contributed to high operational cost and risk. As a result, efficiency decreased due to low data speed and limited system capabilities (Riggins & Klamm, 2017). Menon and Sarkar (2016) noted that data design must include advanced technologies to enhance data speed to support information technology infrastructure to achieve reliability and accuracy for reporting data and system functionality. Lack of system ownership accountability led to system failures (Smallwood, 2014) Therefore, accountability of system ownership desired as system owners must take responsibility to upgrade system of origin, systems of record, and

reporting application systems. Strong leadership is required to influence and encourage teams including system owners to adopt data governance framework concepts described above to achieve optimization in the information technology infrastructure. Jaramillo et al. (2015) and Panaccio et al. (2015) stated that servant leaders build strong teams through coaching accountability and teamwork. Therefore, a system owner who possesses servant leadership skills, such as awareness and stewardship, can stay on top of new data rules and coach teams during system enhancement implementations.

Data Security

I classified data into the following categories for the purpose of this study: confidential, protected, and public data. According to Phan et al. (2016), confidential data contain private and or proprietary information about a business or retail customer and data security is high on confidential data. Protected data contain significant risk to a business or retail customer and data security is high on protected data (Sen & Borle, 2015). According to Sen and Borle (2015), public data contain information that is available to the public and contains low-risk information.

Sipes et al. (2016) conducted a qualitative multiple study to explore data security issues in financial service companies. Sipes et al. found that dated IT infrastructure and lack of data security policies and procedures led to data breaches. Similar to Sipes et al. (2016), Silverman (2015) studied that poor architecture of the application systems reduces the security of data. According to Kim and Patel (2016) and Sipes et al., data security is critical; weak data security architecture can have an adverse impact on bank's reputation, and it can lower profits. Sen and Borle (2015) and Sipes et al. asserted that

apart from an adverse impact on a bank, weak data security architecture can have a negative impact on a bank's customers. A data breach can damage credit power of customers, and cause a loss of financial resources, which can lead to stress and negative physiological outcomes (Sen & Borle, 2015; Sipes et al., 2016).

In the last five years, there has been an increase in data breaches (IBM & Ponemon Institute, 2017). IBM and Ponemon Institute (2017) conducted a qualitative multiple study and 63 companies in the United States participated in the study. IBM and Ponemon Institute (2017) collected data through interviews over a 10-month period. Cost of data breach is increasing yearly and companies are paying a significant portion of funds to protect against data breaches. Figure 1 provides a per capita cost of a data breach over last four years in the United States. Dollar amounts in the Figure 1 represent average cost per breached record. In 2014, average cost per breached record was $201 dollars and in 2017 the cost increased to $225 dollars (IBM & Ponemon Institute, 2017). According to Sen and Borle (2015) and Sipes et al. (2016), business managers should collaborate with technology managers to create innovative solutions to secure data by providing access to data on a need-basis only, and implement technology solutions to increase the security of data.

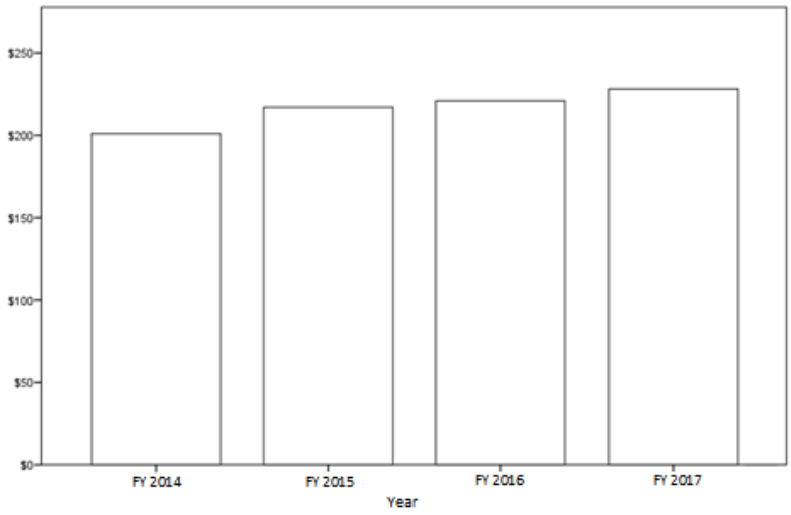

Figure 1. The average per capita cost of a data breach over four years.

The above analysis researchers concluded that poor architecture of the application system reduces data security and causes data breaches. Sen and Borle (2015) and Sipes et al. (2016) asserted that data breaches negatively impact customers and the reputation of a company. A robust information technology infrastructure can increase data security and reduces data breaches. Both business and technology managers should collaborate to create innovative solutions to build a robust information technology infrastructure to protect data through increased data security. Adams et al. (2016) and Jaramillo et al. (2015) showed that servant leaders inspire through courage, teamwork, and challenge. A leader with qualities mentioned above can build a partnership among diverse vital leaders and work together to create innovative technology solutions to serve customer and stakeholders. Therefore, business and technology leaders who possess servant leadership qualities can collaborate to seek optimum technological solutions to protect data from breaches.

Role of Data

Data are often the entire livelihood of an organization, as it is often their source of income and their base for conducting business. Putro et al. (2016) stipulated that data are significant assets in an organization for achieving organizational aims and goals. Data governance involves the means by which the organization manages data assets and covers the policies, roles, rules, procedures, responsibilities, as well as the performance indicators that influences the overall management of these data assets (Putro et al., 2016). Aristei and Gallo (2017) studied that data accuracy is critical because data plays a crucial role in business analysis, reporting, and decision-making process within an organization. Researchers have found that cultural factors influence data governance (Putro et al., 2016). Servant leadership, as indicated previously, has the ability to transform the culture within an organization. According to Liden et al. (2014), when top leaders encompassed serving leadership attributes, the organizational culture was transformed into a serving culture. Korhonen et al. (2013) also stipulated that the role of leadership was crucial in shaping organizational culture for implementing data governance frameworks. Putro et al. (2016) concluded that data governance and an organization's leadership culture had a significant relation, as some organizations have a culture created by their leaders, while other organizations had leaders created by their culture. Servant leadership, as the framework for this study, encourages change through leading, and leading by serving.

Korhonen et al. (2013) stipulated that leadership, as well as vision, are essential aspects for the successful implementation of a data governance plan. Thompson, Ravindran, and Nicosia (2015) stated that the vision and leadership of a Chief

Information Officer (CIO) were vital for the initial and sustained success of all data governance initiatives. According to Wong (2016), foresight has been identified as a characteristic of a servant leader. Thompson et al. continued to state that an effective leader is one who clearly communicates and directs the organization. Such a leader can accomplish challenging and difficult goals (Thompson et al., 2015). Servant leaders have the ability to be communicators by listening to those who they serve (Greenleaf, 1977). The CIO is responsible to make and implement decisions related to data governance, as well as the person to report to (Thompson et al., 2015). Furthermore, data stewardship is also needed as it is a means to acknowledge accountability for managing specific data assets (Thompson et al., 2015). Smallwood (2014) stipulated that as all employees have their own responsibility regarding data governance, there is not one single person responsible for the entire endeavor. Trust is thus an important aspect of data governance, as everyone involved is responsible for caring and protecting all data (Thompson et al., 2015).

To conclude, data represent the core of a business, and data accuracy is extremely important to make diligence business decisions. Putro et al. (2016) stipulated that data accuracy is achieved through implementation of data policies, procedures, role assignment, and defining clear responsibilities under data governance frameworks. Thompson et al. (2015) emphasized that it is not a single person's responsibility for data accuracy but the responsibility of the entire organization through data stewardship. The culture of an organization needs changes to be diligent, and everyone must take responsibility from the point of data collection and entry into an application system

including data analytics and reporting. Several aspects of data governance would benefit significantly from servant leadership inspired conduct. Servant leadership can change the culture of an organization and is thus ideal to implement before extensive data governance action (Wong, 2016). According to Greenleaf (1977), servant leaders build trust by being trustworthy and leading by example. To successfully establish substantial change in an organization to promote the significance and value of data accuracy, training for management and a full commitment to embrace servant leadership is needed.

Data Governance Office

Dahlberg and Nokkala (2015) conducted a qualitative multiple case study to explore leadership involvement in data governance frameworks implementation using two surveys, with 212 and 68 respondents respectively. They found that leadership involvement is critical in the implementation of data governance frameworks. Dahlberg and Nokkala stated that a principal component of data governance frameworks is the establishment of a data governance office to administer the data governance functions. Smallwood (2014) asserted that a data governance office should include executive data management, a risk and regulatory oversight committee, corporate data office, information resources management office, and a line of business data offices to support effective IT infrastructure and capabilities. Queen and Fasipe (2015) stated that these offices can help form a robust data governance framework. Smallwood stated that data governance frameworks are complex and require teamwork to be successful. Adams et al. (2016) stated that servant leaders achieve success through teamwork and promote teamwork through coalitions. As such, servant leadership may be the most successful

approach for leading a data governance team, because a servant leader ensures trust, teamwork, and reliance (Greenleaf, 1977). Trust, teamwork, and reliance are few of the qualities needed in a data governance team to be successful.

Korhonen et al. (2013) posited that executive management should include senior data leadership roles. Queen and Fasipe (2015) emphasized that an executive manager should provide resource support to corporate data office and other business data offices to ensure these units are equipped with appropriate resources to perform job functions. Smallwood (2014) posited that representatives from the executive management office should serve as intermediary leaders between corporate data offices and the board of directors of a company to maintain a dynamic relationship. As previously stated, strong leadership skills are needed to manage data governance frameworks, as well as to reduce resistance in an organization with the implementation thereof (Ladley, 2012). The key characteristics of a successful and productive executive manager included strong leadership and team building skills, as well as effective communication (Adams et al., 2016). Similar to Adams et al. (2016), Jaramillo et al. (2015) noted that servant leaders promote teamwork and encourage each team to work together to achieve common goals through effective communication. Therefore, executive managers who have qualities of servant leaders can motivate employees through collaboration and effective communication to carry out executive management functions.

According to Oprea, Lacatus, and Hutanu (2014), a risk and regulatory oversight committee serves as an intermediary resource between an external regulatory entity, internal audit, and or internal data offices. Culhane (2014) stated that the role of a risk

and regulatory oversight committee is to inform internal data offices about recent regulations and compliance changes in the banking industry. The role of a risk and regulatory oversight committee is to make sure individual lines of business data offices are following most current risk polices and regulations (Culhane, 2014).

According to Doh and Quigley (2014), servant leaders possess collaboration, critical thinking, adaptability, stewardship, and effective communication skills. Doh and Quigley and Panaccio et al. (2015) stated that these skills are desirable when working with diverse teams. It is essential for a risk and regulatory oversight committee to employ servant leaders because this type of leader can work with diverse leaders through stewardship and collaboration to establish roles and responsibilities to carry out a risk and regulatory oversight committee functions.

Yang, Madnick, Wang, Wang, and Hongyun (2014) stated that a corporate data office includes a chief data officer and data managers. According to Ladley (2012), the role of a corporate data office is to generate templates and guidance documents utilized by an individual line of business data offices throughout the organization. Yang et al. (2014) asserted that a corporate data office overlooks activities performed by individual lines of business data offices. According to Ladley (2012), a corporate data office plays an important role in data governance frameworks by assessing the data requirements provided by internal audit or external regulatory agencies. Culhane (2014) and Smallwood (2014) asserted that a corporate data office provides assistance to individual data offices by providing management authorizations and verifications related to data

integrity, controls, and ensures that individual data office members receive correct training regarding regulatory and risk regulations and policies.

Doh and Quigley (2014) stated that servant leaders are known for their collaborative skills. Working with numerous teams can create conflicts and leaders who possess collaborative skills can reduce conflicts through negotiation and collaboration. Servant leaders can work with an executive data management office and individual lines of business through stewardship to establish roles and responsibilities to carry out corporate data office functions. Managing all of the above-mentioned aspects of data governance requires a leader with insight and foresight, and who is pro-active. According to Jaramillo et al. (2015) and Wong (2016), foresight is an attribute of servant leaders, which highlights their ability to foresee the future and forecast the future based on the past scenarios. Therefore, servant leaders can provide a customized approach to support corporate data office functions based on previous experiences.

According to Ladley (2012), the information resources management office ensures that the data quality assurance methodologies to test comprehensiveness and precision of data are in place by implementing data policies. Ramachandran (2016) asserted that the information resource management office can provide guidance to technology teams on the software development lifecycle (SDLC) methodology for new changes to application systems. Chakravorty (2015) and Tihanyi et al. (2015) stated that changes may be dictated by new risk policies and regulations by the government regulating agencies. Ladley (2012) stated that information resources management office plays a major role in conducting user acceptance testing of new application systems

changes to ensure that application systems are working as designed before implementing new data changes into production.

The information resources management office also classifies and identifies any data issues, and communicates issues to appropriate data management executives. Communication is thus essential, and being a good communicator is part of being a servant leader (Jaramillo et al., 2015). According to Musgrave (2014), effective communication and being able to customize the message to senior leadership is essential to get the right message in front of the right audience. Ramachandran (2016) stated that communication of an explicit message at the right time can help resolve urgent issues and avoid delays during system implementations. Therefore, leaders who are effective communicators are desirable to carry out responsibilities of information resources management office functions.

Bennett (2016) and Peterson et al. (2016) stated that a line of business data office provides data management support to the individual lines of business. Smallwood (2014) and Williams et al. (2016) asserted that the role of individual line of business data office is to ensure role establishment of data stewards, data suppliers, data users, data analysts, data managers, data integrity consultants, data integrity managers, report generators, report analysts, and report stewards are in place to support IT infrastructure. An individual line of business data office works with business and technical teams to implement IT changes required by new risk polices and or regulations mandated by government regulating agencies (Ganzelli & Bray, 2016; OFR, 2016).

Smallwood (2014) stated that working with various teams can be challenging as each team has it norms. Korhonen et al. (2013) asserted that data governance is often a changing environment and working with teams requires adaptability skills to convey the message across teams. The leaders of data governance should be able to adapt, regardless of their knowledge and skill. Adams et al. (2016) examined that individuals who are able to adapt in a work environment that is fluid were found to be more successful when compared to peers unable to be flexible in tasks, despite their knowledge or experience. According to Focht and Ponton (2015), servant leaders possess a key quality of commitment to the growth of people. According to Musgrave (2014), servant leaders are individuals who are present for team members when they need guidance and encouragement. Jaramillo et al. (2015) stated that each follower can have unique learning ability, growth level, and characteristics. Adams et al. (2016) stipulated that a servant leader's commitment to the growth of each follower provides an individualized approach to influence and encourage followers to achieve their full potential. A servant leader's commitment to the growth is a desirable quality that is needed during an organizational change such as the implementation of data governance framework (Smallwood, 2014).

Jaramillo et al. (2015) stated that servant leaders are devoted to providing help to each follower in the organization to grow professionally and personally. Adams et al. (2016) stipulated that servant leaders provide opportunities for career growth to their followers and in return, followers feel valued by their leaders. Focht and Ponton (2015) stated that followers go above and beyond to achieve challenging corporate goals because they feel the leadership recognizes their work and followers have the desired guidance

and support from their leaders. According to Musgrave (2014), servant leaders have the ability to conceptualize, be aware of their environment, and to foresight the future. The combination of these skills make a servant leader capable of being pro-active and adapt when the need arises, making them suitable for managing data governance. In next sections, I provided analysis on the role of data steward, data supplier, and data users.

Data steward role. Zhang, Lin, Xiao, Wu, and Zhou (2016) explained that a data steward is someone who is responsible for a particular set of data on an application system. Smallwood (2014) stated that a data steward is responsible for completeness, integrity, validity, accuracy, and timeliness of data that exists in an associated application system. Wang, Li, Liu, Li, and Li (2014) asserted that a data steward is responsible for the integrity of specific derived data elements used in reports from points of data capture through each application system. A data steward collaborates with other teams to fulfill assigned duties, other team may include report generator and or report steward (Wang et al., 2014).

Data supplier role. According to Donker and van Loenen (2016), a data supplier is someone who takes data from one application system and then sends data to another application system with or without data aggregations and/or transformations. As an example, a data supplier in a bank takes data from system X owned by a data steward, then sends data to a report generator with or without aggregations and/or transformations. Ladley (2012) explained that a data supplier is accountable for classifying and aggregating data, then sending data to a report generator in the agreed upon timeframe. If

data need to be aggregated, then a data supplier needs to do so based on requirements provided by a report generator or by external regulators (Ladley, 2012).

According to Wong (2016), servant leaders help followers to achieve both personal and professional goals through engagement, influence, and mentorship. A data governance leader who is also a servant leader can play an important role not only establishing data steward and data supplier roles but also help achieve success through engagement, influence, and mentorship. Jaramillo et al. (2015) asserted that servant leaders are selfless and they care about their followers and strategic goals of an organization. Furthermore, servant leaders are good listeners and communicators (Adams et al., 2016), which are essential attributes of successful teamwork and building a productive community (Greenleaf, 1977). Therefore, servant leaders can help achieve organizational objectives and also help their followers achieve success.

Data users. Data users are classified as anyone who uses data and has a right to use data for business purposes (Chen et al., 2016). Ladley (2012) asserted that data users should be involved in user acceptance testing when new changes are implemented to an application system. It is essential to note the scope of the term “users.” Users include a variety of individuals that use the data and interact with other data users. Users can include analysts, managers, consultants, stewards, and report generators (Ladley, 2012). The following is a brief discussion of the various roles that users may take on.

Roth (2015) stated that a data analyst is someone who analyzes data for business needs. The role is important to understand data trends that include data accuracy. Data

analysts should follow data analysis standards determined by the line or type of business data offices that support business functions (Roth, 2015).

Smallwood (2014) stated that a data manager is someone who provides leadership to data analysts. The role is important to support data analysis through new rules, regulations, and business requirements (Smallwood, 2014). Johnson (2015) and Smallwood noted that data managers should work with data users, data stewards, and data suppliers to stay abreast of the new business function needs for data analysis.

He, Guo, and Feng (2016) noted that a data integrity consultant is someone who is a subject matter expert on rules and regulations provided by internal business functions and external regulatory entities. Ladley (2012) asserted that data integrity consultants need to support line of business data offices and consult data stewards, data suppliers, report generators, and report stewards with industry practices in the data management field. Lin, Shen, Chen, and Sheldon (2017) posited that data integrity consultants should follow data integrity standards determined by the line of business data offices that support business functions.

Ladley (2012) stated that a data integrity manager is someone who provides leadership to data integrity consultants. The role is important to provide guidance to data integrity consultants during the implementation of new data rules and application system implementations (Ladley, 2012). Bardini Idalino, Moura, Custodio, and Panario (2015) and Smallwood (2014) posited that data integrity managers should work with data stewards and data suppliers to stay abreast of new data rules.

Smallwood (2014) stated that a report generator is someone who receives data from various data suppliers and/or data stewards directly through an automated or manual process. Habek and Wolniak (2015) asserted that a report generator collects data, then produces reports manually or by using an application system. According to Smallwood (2014), a report generator must follow instructions provided by report stewards and or regulators. A report generator needs to create and preserve subsidiary documentation for each company board of director reports, and regulatory or risk report (Smallwood, 2014).

According to Habek and Wolniak (2015), a report analyst is someone who analyzes reports, and he or she is responsible for an administrative level review of reporting data, and the expectation is that the overall review should be complete and faultless. A report analyst needs to review systematic and manual modifications for accuracy and validity of data (Habek & Wolniak, 2015; Smallwood, 2014). A report analyst needs to ensure that new rules and standards are reflected in the reports (Elkin, Neiman, & Wulff-Nilsen, 2016).

Smallwood (2014) stated that a report steward is someone who owns responsibilities to ensure reports are generated on time and data successfully passes through appropriate controls of regulatory or risk reports. Hamersky (2016) posited that a report steward should be accountable for report organization, acceptance, and application of new changes to reports. Greco, Sciulli, and D'Onza (2015) noted that a report steward should create and preserve application system data element mapping files for traceability purposes. A report steward should conduct application system testing every time there is

a new change to an application system for data accuracy and validity purpose (Greco et al., 2015).

According to Parris and Peachey (2013), servant leaders focus on helping those they lead to succeed. Therefore, servant leaders can provide appropriate tools and trainings to ensure their teams are equipped with right tools and trainings to perform job functions. Servant leaders are excellent communicators through the act of listening to those who they serve Greenleaf (1977). Parris and Peachey (2013) noted that servant leaders exhibit a talent to gain trust despite undertaking high-risk tasks and can effectively communicate with those being served. According to Musgrave (2014), servant leaders are capable of leading by establishing and articulating goals, whilst clearly verbalizing that goal with a sense of certainty and purpose. Liden et al. (2014) noted that a serving culture is characterized as a work environment in which participants share the understanding that the behavioral norms and expectations are to prioritize the needs of others above their own and to provide help and support to others.

To summarize analysis above, a data governance office is an essential component of data governance frameworks. Data governance office is essential because it helps create policies, procedures, and role and committees establishment within an organization to implement and promote functions of data governance frameworks (Dahlberg & Nokkala, 2015; Smallwood, 2014). These functions include executive data management, risk and regulatory oversight committee, corporate data office, information resources management office, and a line of business data offices to support adequate IT infrastructure and capabilities. Apart from committees and offices, data governance office

establishes functional roles of data users, steward, and supplier illustrated above. Each of these roles is important to carry out the functions of data governance frameworks. Thus far, the analysis showed that data governance frameworks involve dealing with many teams and each team can have their norms and objectives. A corporate culture that upholds data governance to protect data assets is desirable to implement data governance frameworks (Ladley, 2012). In this study, I also established that servant leaders demonstrated proven success when dealing with diverse teams and bringing consensus among teams to achieve corporate objectives. Greenleaf (1977), Musgrave (2014), and Parris and Peachey (2013) showed that servant leaders are excellent communicators, adaptive to the evolving organizational environment, and can promote organizational agenda. Servant leaders are strategy-oriented and make strategic decisions, focus on inspiring the team, modeling the culture, and taking risks on new initiatives. Therefore, the servant leadership approach is desirable. Corporate data managers including data analysts, data managers, data integrity consultants, data integrity managers, report generators, report analysts, and report stewards who are also servant leaders can understand stakeholders' needs and provide innovative solutions that serve the needs of stakeholders to implement data governance frameworks.

Risk Management

According to Kerle (2015) and Sen and Borle (2015), poor risk management leads to poor data controls, which then increases the risk associated with data. Smallwood (2014) found that lack of individual accountability can lead to poor risk management. Adams et al. (2016) and Panaccio et al. (2015) found that a servant leader plays a critical

role in inspiring followers to become accountable through awareness and persuasion. According to Kerle (2015), risk managers who possess accountability skills are best suited for risk reduction opportunities. Angeles (2017) posited that a risk management process in data governance frameworks should exist to reduce the risk exposure of a bank. Phan et al. (2016) asserted that lack of controls and testing of data for risk, regulatory, and board of director reports can contribute to high risk for a bank. A bank can be exposed but not limited to regulatory, reputation, operational, and or credit risk without proper enforcement of risk management (Angeles, 2017; Gatzert, Schmit, & Kolb, 2016).

Regulatory risk. Kerle (2015) noted that regulatory risk occurs when the government and or other regulatory agencies changes laws and or regulations and companies fail to comply with new regulations. Angeles (2017) stated that lack of understanding in frequency and complexity of changes in rules or instructions can increase the regulatory risk in banks. Smallwood (2014) posited that banking managers should work with risk and regulatory oversight committee or other regulatory agencies to understand new changes to reduce the impact of regulatory risk.

Reputation risk. According to Gatzert et al. (2016), a reputation risk is defined as a risk of damaged public repute. A reputation risk can potentially result in a loss of business from reporting inaccurate and incomplete information on a specific report or schedule. A reputation risk includes a potential negative impact on the brand, clients, or employee perception arising from publication by a regulator or media coverage of the published information (Gatzert et al., 2016). Kerle (2015) noted that a reputation risk can

be reduced by enforcing proper controls and testing of data before publishing data for reporting purposes.

Operational risk. St-Hilaire (2014) noted that an operational risk can occur due to not being able to perform application systems enhancements that are necessary for a new risk and or regulatory change to the data calculations. Andersen, Hager, and Vormeland (2016) posited that a proper routine evaluation process should be in place to assess a list of application systems that are due for new enhancements. Andersen et al. (2016) and St-Hilaire (2014) emphasized that proper on-time enhancements to application systems may reduce operational risk.

Credit risk. According to Li and Zinna (2014), credit risk is defined as a risk when a borrower cannot pay a loan. It is important to perform a credit risk evaluation before providing loans to both retail and business customers. According to Kerle (2015), when credit data that is a true history of credit activity performance of retail or business customer is inaccurate in databases, a loan officer in a bank can make incorrect decisions that can lead to credit risk in the long term for a bank.

To conclude, without optimized risk management, a data governance framework cannot be successful. Risk management is not something that achieved by one group or one person, it is a collaborative effort, each employee of an organization must act as a risk manager to mitigate regulatory, reputational, operational, and credit risk illustrated above (Kerle, 2015; Sen & Borle, 2015). Smallwood (2014) found that individual accountability quality plays an essential role in the risk management practices and how to become a sound risk manager. Servant leaders plays a critical role in inspiring followers

to become accountable through awareness and persuasion (Adams et al., 2016). A leader's ability to conceptualize a vision for risk reduction programs is essential for sound risk management (Kerle, 2015). Servant leaders can envision beyond the day-to-day operations and focus on the big picture for risk reductions opportunities for their organizations through the implementation of sound risk management practices. Servant leaders can see a potential for organizational growth and inspire followers through awareness and encouragement to achieve innovative goals. Therefore, servant leaders can help shape an organizational culture through awareness and persuasion to support sound risk management practices and implement data governance freamworks.

Change Management

Putro et al. (2016) and Skvarciany and Iljins (2015) determined that a lack of executive leadership in change management leads to poor implementation of new changes to application systems as well as to business processes, it can leave key stakeholders out of the picture, and projects can run over budget. According to Johnson (2015), change management is an important component of data governance frameworks because there are constant changes to rules and regulations in the banking industry. Changes to rules and regulations enforced by risk management committees and or government regulating agencies require modifications to the application systems as well as changes to the data processes (Johnson, 2015).

Smallwood (2014) stated that strong change management processes can help ensure accurate, complete, and consistent regulatory and risk reporting data changes implemented successfully to application systems. Changes can occur from sources such

as changes in reporting guidelines, government regulations, and or application system enhancements to accommodate new rules and regulations (Skvarciany & Iljins, 2015; Johnson, 2015). Garousi and Mantyla (2016) and Smallwood (2014) posited that data stewards, data suppliers, report stewards, and report generators should ensure that they are thoroughly involved in application system change related actions to ensure that reporting requirements are appropriately measured, and processes are in place to test reporting data and processes during software and hardware changes to an application system. The line of business staff support and data suppliers should ensure they are aware of application systems changes. Ladley (2012) specified that missed changes to reportable data can produce inaccurate reports, resulting in but not limited to regulatory and/or reputation risk.

Skvarciany and Iljins (2015) stated that companies go through many changes such as reorganization, new policies and procedures to conduct business activities, employees change jobs or take leave for personal reasons, or other life events happens, and these events are a part of organization's life cycle. Panaccio et al. (2015) studied that servant leaders convince their followers to change for good to achieve desired results. Jaramillo et al. (2015) stated that servant leaders use a nonjudgmental approach to influence their followers to learn and adopt new processes and skills. Change is crucial for innovation and competitive advantage (Coles, 2015). According to Adams et al. (2016) and Jaramillo et al. (2015), instead of using a positional authority to force to learn new skills and processes, servant leaders encourage their followers using a nonjudgmental approach to acquiring new skills to be successful in the organization. Followers feel a sense of

comfort and equality through a nonjudgmental approach (Adams et al., 2016). Servant leaders can empower their followers and provide training to ensure there are backups available and data process procedures promptly updated as an essential practice for business sustainability. Smallwood (2014) stipulated that leaders can ensure through training and mentorship that data stewards, data suppliers, and report generators have processes and procedures in place to cover and/or transfer job duties if needed to avoid any disruption of business activities.

Smallwood (2014) stated that change management and effective communication are closely related to strong leadership especially in the implementation of data governance frameworks. Adams et al. (2016) and Jit, Sharma, and Kawatra (2016) found that communication is a key to a successful relationship between a leader and a follower during a period of change. Leaders and managers are responsible for ensuring that all aspects of a system are both operational and routinely employed by staff. Failure to employ a new protocol or inability to use the system both lead to system failures that are costly and increases risk (Korhonen et al., 2013). Grisaffe, Van Meter, and Chonko (2016) stated that servant leaders listen to their followers and assess the circumstances, then provide appropriate support to guide their followers during organizational changes. Adams et al. (2016) stated that listening to their followers enable servant leaders to understand followers viewpoints and validate their perspectives.

According to Jaramillo et al. (2015), mentorship is a key quality of a servant leader. Grisaffe et al. (2016) stated that leaders can promote change through training and mentorship. Servant leadership is about taking responsibilities and leading teams to

achieve corporate goals (Jaramillo et al., 2015). Servant leaders take leadership responsibility wisely and lead their followers to help them be successful (Jaramillo et al., 2015). Adams et al. (2016) stated that servant leadership is an art and science to not only achieve success in corporate goals but also help their followers achieve their personal and professional goals.

To summarize, change has become the norm in organizations. Change is required to be innovative and stay ahead of the competition. Technologies are continually changing, and application systems must be kept up-to-date to reduce operational risk and cost (Smallwood, 2014). A crucial component of the data governance framework is optimal change management. Changes to data rules, application systems, and business processes require reliable and robust change management for data accuracy and proper functioning of the IT infrastructure (Garousi & Mantyla, 2016; Johnson, 2015). The above analysis found that effectiveness of change management depends on a leader's capabilities who lead the change. Senior leadership involvement is necessary as non-involvement of senior leadership leads to poor implementation of changes and projects can run over budget. Changes within an organization can create organizational stress because of the unknown. Change leaders who are also servant leaders can help lead organizational changes efficiently because servants leaders are known for leading a change through influence, encouragement, and collaboration. Servant leaders build trust among teams, foster a culture that thrives in evolving organizational environments, and encourages and promotes teamwork (Adams et al., 2016; Panaccio et al., 2015). Thus,

change leaders who are also servant leaders can promote organizational change successfully to implement data governance frameworks.

Potential Themes

Based on my literature review, I foresaw three to five potential themes that may emerge from the research findings that relates to the research question and conceptual framework. The first theme the emergence of leadership in an organizational culture that emphasizes data governance to protect data assets and to reduce risk and cost, as Putro et al. (2016) stated that an organizational culture that accepts change and encourages governance of data are critical for data governance framework implementation. According to Merino et al. (2016), promoting awareness of data quality necessities at the organizational level could reduce inaccuracies in the data, and operational cost can reduce significantly by the reduction in the data cleanup efforts at a later stage. A second theme is the need for policies and procedures for data governance. Smallwood (2014) stated that implementation of policies and procedures are required as these documents can guide teams and reduce ambiguity in the data governance framework implementation. According to Fernandes et al., 2012, procedure documents play an essential role when companies go through a significant change. Chakravorty (2015) stated that BCBS 239 compliance requires financial institutes to create procedures for business continuity and disaster recovery planning. Ladley (2012) identified that procedure documents are essential to achieve consistency in reporting and enhance data quality.

The third theme combines data accuracy and security as Aristei and Gallo (2017) and Putro et al. (2016) emphasized the importance of accurate data in critical business decisions. Inaccurate data can increase operational cost and misrepresent data on key risk and regulatory reports damaging reputation of a bank (Chakravorty, 2015). Korhonen et al. (2013) stated that accuracy of data could be increased through testing and validation. Silverman (2015) emphasized data security as it is a crucial subject in the digital age and companies must shift their focus to protect data and build a strong data security to protect data from data breaches. The formation of a data office is the fourth theme e. According to Prorokowski and Prorokowski (2015) and Smallwood (2014), the formation of a data office is required to conduct data governance framework activities. A data office can help centralize core components of the framework and to carry out framework activities. Smallwood stated that a data governance office should include executive data management office, a risk and regulatory oversight committee, corporate data office, information resources management office, and a line of business data offices to support efficient IT infrastructure and capabilities. The role of each office listed above is essential to establish policy and procedures, collaboration among teams, provide support to business, technology, and framework implementation teams (Peterson et al., 2016; Smallwood, 2014).

The fifth theme is commitment of strong leadership; Musgrave (2014) and Smallwood (2014) acknowledged that strong leadership commitment is a fundamental component to implement change in an organization. Data governance framework requires interaction between business and technology teams and interactions between many teams

can create conflicts (Focht & Ponton, 2015). Greenleaf (1977) explained that a servant leader has characteristics to identify follower's behavior and servant leader can help the follower through mentorship to build relationships with different teams to reduce conflicts. According to Liden et al. (2014) when top leaders adopted servant leadership characteristics, the organizational philosophy changed into a service culture. Korhonen et al. (2013) also stipulated that the role of leadership was crucial in influencing organizational culture for implementing data governance frameworks. Putro et al. (2016) According to Musgrave (2014), servant leaders are capable of leading by establishing and articulating goals, while clearly verbalizing that goals must have a sense of certainty and purpose. In the analysis above, I submit potential research finding themes that successful corporate data managers in some banks use to implement data governance frameworks to reduce operational costs and risks.

In the above analysis I compared and contrasted different point of views pertaining to data governance frameworks relationship to servant leadership, and concluded that a strong leader can inspire teams through mentorship to accomplish organizational objectives and data governance leaders interact with both internal and external regulators (Panaccio et al., 2015). Liden et al. (2014) stipulated that servant leaders possess influential skills, which are essential for leaders in an organization that deal with internal and external entities. Data management involves dealing with many application systems, and complex data-driven activities (Smallwood, 2014). Focht and Ponton (2015) asserted that servant leaders utilize conceptual skill to guide team members during a difficult project. Doh and Quigley (2014) found that servant leaders

use conceptual skills to provide precise instructions towards challenging organizational goals. Servant leaders are observant and can understand perspectives of their followers. Implementation of data governance framework requires interaction between business, compliance, and technology teams. According to Smallwood (2014), a leader who is well versed in both business and technology can influence teams effectively because it is essential in the decision-making process that involves data changes as well as improvement of existing application systems. A leader who is technically observant can guide teams during implementations of new functionality and or existing application system enhancement phase (Smallwood, 2014).

Since servant leaders are capable of stewardship (Greenleaf, 1977), they are capable of taking leadership responsibility and leading their followers to help them become successful (Jaramillo et al., 2015), as well as building trust amongst the team and encouraging a productive team environment (Jaramillo et al., 2015; Panaccio et al., 2015). The meaning of healing in the context of servant leadership is caring about the personal well-being of followers. According to Adams et al. (2016), work-related stress can have a negative effect on followers and halt business processes. Servant leaders care about the well-being of their followers and provide guidance and support to tackle problems that can occur due to personal and professional issues. Jaramillo et al. (2015) stated that servant leaders could help shape an organizational culture that promotes well-being of team members. Adams et al. and Panaccio et al. (2015) postulated that the cognitive style of an individual was directly correlated with their critical leadership skills, which includes interpersonal communication, decision-making, as well as team building

and is needed for the implementation of business intelligence systems. Trust is a significant attribute for a leader in data governance, as team members have to be comfortable with their leader in order to sufficiently and thoroughly carry out data governance functions and report any problems.

The discussion above has established the sheer volume of both technological and organizational leadership considerations that must be taken into account when implementing a data governance framework. The discussion of the concepts above established that the role of effective leadership in the data governance frameworks is critical. As stated by Greenleaf (1977), servant leaders prioritize their followers, ensuring that their followers become healthier, wiser, more autonomous, and freer, as well as more likely to become servant leaders themselves, which indicates that the followers of servant leaders would be able to follow an example and work responsibly with what is entrusted to them. By entrusting followers, they become more confident in their tasks, and they may feel valuable to the organization and live up to their potential.

The number of technical components and players involved in the transmission and recording of data makes it abundantly clear how system failures occur and expose banks to undue risk. In order to better understand the issues related to change management, it is useful to review the specific data and information components of a data governance framework. This discussion helped to draw out some of the key issues associated with integrating new applications with existing technology and protocols. In this multiple case study, I explored some of the specific strategies that managers and leaders can employ to

manage change in their organizations to implement data governance frameworks successfully.

Transition

The volume of applications used to create, manage, and store risk data in banks is incredibly large. One can see from this review that the principles set out by BCBS 239 have been complicated for banks to implement. This was due to the number of applications already in use by banks that led to redundancy and inefficiencies. It also made it complicated to implement new technologies and protocols over existing protocols. Corporate data managers found that implementing these programs required a detailed look at their existing protocols and a change management protocol to ensure that new technologies are used, and new procedures are followed. The purpose of the multiple study was to explore, through interviews, the various strategies that managers have found to be useful in the implementation of these new principles of risk data management and governance. The interview population was drawn from corporate data managers in banks located in North Carolina and New York. The conceptual framework that guided this study was servant leadership theory, which helped to illuminate the various impacts that different data users have in the larger organizational system.

In my review of the literature, I discovered the complexity and volume of technical considerations that must be taken into account during the implementation process. Not only the applications themselves but also the procedures used to utilize these programs are also crucial in the reeducation of costs and risk associated with systems failure. The number of actions and procedures used must be well coordinated through a

strong leadership team. In the literature review I found there were several aspects of data governance that benefitted greatly from servant leadership, management and leaders who possessed servant leadership qualities were key attributes of the implementation of any large-scale organizational change. Servant leaders have the ability to inspire the culture of an organization for change through mentorship, influence, and effective communication to accomplish organizational objectives, thus, servant leaders promoted organizational change successfully to implement data governance frameworks. Now that I have established a firm background for the study, in Section 2 I presented details of the proposed study including method, design, population, sampling, and data collection procedures.

Section 2: The Project

The objective of this study was to explore strategies corporate data managers in the banking industry use to implement data governance frameworks in their organizations to reduce operational costs and risks. In Section 2, I provided detailed information on the methodology, data collection, and data analysis process. This section contains the purpose statement, role of the researcher, participants, research method, research design, population and sampling, ethical research, data collection instruments, data collection technique, data organization technique, data analysis, reliability, and validity.

Purpose Statement

The purpose of this qualitative multiple study was to explore the strategies that successful corporate data managers in some banks use to implement data governance frameworks to reduce operational costs and risks. The target population consisted of seven corporate data managers in three banks located in North Carolina and New York who had developed effective strategies to implement data governance frameworks in their organizations to reduce operational costs and risks. The results of the study may lead to positive social change, as bank leaders may use the findings to maintain reliable and accurate data as well as reduce data breaches and misuse of consumer data. The availability of accurate data may enable corporate bank managers to make informed lending decisions to benefit consumers.

Role of the Researcher

The role of the researcher is an essential part of a qualitative study because the researcher is the primary data collection instrument (Bolte, 2014; Fleet, Burton, Reeves,

& DasGupta, 2016; Resnik, Miller, Kwok, Engel, & Sandler, 2015). I served as the primary instrument for data collection in this study. The role of the researcher in a qualitative study is critical because the researcher plays an important role in conducting interviews and analyzing results (Bolte, 2014; Fiske & Hauser, 2014; Fleet et al., 2016). I reviewed the Belmont Report for ethical principles and completed the Protecting Human Research Participants training offered by the National Institutes of Health Office of Extramural Research. Knowledge gathered from the Belmont report helped me understand three principles: respect for participants, benevolence, and fairness. As a program manager, I possess knowledge in areas of data management. In my role as researcher I did not have a relationship with participants, and participants did not receive compensation of any kind.

I completed the Protecting Human Research Participants training on June 23, 2016, offered by the National Institutes of Health Office of Extramural Research (Certification Number 2100204, Appendix A). The training provided by National Institutes of Health Office of Extramural Research helped me understand the consent process, mitigate ethical challenges in the study, and protect the privacy of participants. It is impossible for a researcher to eliminate all bias, but the researcher should eliminate bias as much as possible (Bolte, 2014; Fleet et al., 2016; Nagasaka, Bocher, & Krott, 2016). I mitigated bias during data collection and analysis by not asking leading questions during the interview process and by analyzing the data based on the knowledge gathered from corporate data managers through interviews. To further mitigate bias, I triangulated data.

I started the research by conducting the interviews using open-ended questions. Open-ended questions allowed participants to express insightful information on data governance frameworks in the banking industry. A researcher should follow a protocol that guides him or her to collect trustworthy data in a case study research design (Bolte, 2014; Fleet et al., 2016; Onwuegbuzie & Hwang, 2014). I used an interview protocol (see Appendix B) as a guide for the interview format, and the protocol added consistency to the qualitative research process. Gathering data through interviews allowed me to understand data governance frameworks at a deeper level.

Participants

The population sample consisted of seven corporate data managers in three banks located in North Carolina and New York who had developed effective strategies to implement data governance frameworks in their organizations to reduce operational costs and risks. In a qualitative study, interviewees play a major role because interviewees are critical sources of data (Bothin & Clough, 2014; Elo et al., 2014; Park & Park, 2016; Stoddard, Dotson, & Das, 2016). The selection process should ensure that participants have relevant knowledge of the study topic (Elo et al., 2014; Park & Park, 2016; Stoddard et al., 2016). The selection criteria included the knowledge of the study topic, number of years of experience, and requirements of the institutional review board (IRB). Selected participants had extensive knowledge in data governanceframeworks, data architectures, data offices, data security, and data management services in the banking industry. Participants had 5 to 16 years of experience in their relevant field of expertise.

Professional social media Internet sites can provide access to a verity of professional study participants, and many of these sites offer search options to gain access to participants' characteristics such as subject matter knowledge of a particular topic or profession (Bender, Ferris, Cyr, & Arbuckle, 2017; Dodge & Chapman, 2018; Stoddard et al., 2016). Professional social media profiles of potential participants can enable a researcher to gain access to participants' characteristics, which can allow a researcher to determine potential participants' eligibility based on the research question (Bender et al., 2017; Dodge & Chapman, 2018; Stoddard et al., 2016). I started the participant recruitment process via LinkedIn professional social media networking website after I received IRB approval (Number 03-23-18-0415095). In the advanced search option of LinkedIn, I typed *data governance* and *data management* in the key words search box, and selected industry as financial services and English as profile language. Then I read profiles and selected potential participants in the North Carolina and New York areas based on expertise in the data governance field in the banking industry.

Potential participants can be contacted via e-mail initially, and after initial contact a researcher should establish a preferred method for future communications with the participants for data collection purposes (Bender et al., 2017; Park & Park, 2016, Yin, 2014). I contacted potential participants via the LinkedIn in-network contact e-mail service. I used an invitation e-mail letter (see Appendix C), and I included a Data Governance Knowledge Check Questionnaire (see Appendix D) and a consent form. The invitation e-mail letter provided a brief introduction and the reason for contacting the

participants. The Data Governance Knowledge Check Questionnaire was a qualifier questionnaire that helped me determine whether participants had knowledge of the strategies explored in this study. The consent form provided information about the privacy and risks and benefits of the study.

After I received consent from participants and confirmation of their eligibility to participate in the study, I contacted participants via e-mail and telephone to schedule face-to-face and Skype video interviews. I sent participants the interview questions via e-mails prior to the interviews. Trust and mutual respect are necessary to establish rapport between participants and researchers, and researchers should establish a working relationship with participants to build trust and ensure confidentiality (Elo et al., 2014; Marin, Negre, & Perez, 2014; Park & Park, 2016). I established a working relationship with participants to build trust and mutual respect and to ensure their confidentiality after I received confirmation from them to participate in the study. I ensured that participants were aware of the nature of the study, risks, and benefits as stated in the consent form. I reiterated that confidentiality of data was of utmost importance. I also ensured participants that their personal and professional information would not be shared with anyone.

Research Method

I used a qualitative research method for my study. The qualitative research method is used to provide a detailed description of a phenomenon and to explore the context of information to assess its relevance to solving business problems (Bolton, 2015; Park & Park, 2016; Williams & Gemperle, 2017). The qualitative approach is beneficial

because the focus is on identifying patterns that can provide knowledge about complex action-oriented organization behaviors (Bolton, 2015; Singh, 2015; Williams & Gemperle, 2017). A qualitative study can provide data regarding individuals' life experiences through open-ended interview questions (Clayton, 2016). In business studies, qualitative research provides perspectives of various stakeholders based on individual experiences (Bolton, 2015; Singh, 2015; Williams & Gemperle, 2017). The qualitative research method allows for flexibility, dynamism, and detailed textual descriptions needed to address the research problem (Merriam & Tisdell, 2015). Given the focus of the study, which was to explore the strategies used by corporate data managers, a qualitative research method was appropriate.

I considered two other methodologies: mixed and quantitative methods. Mixed-methods research techniques are a viable mode of exploration when there is a need to use quantitative and qualitative approaches within the parameters of the study (Venkatesh et al., 2013). The mixed-methods approach requires additional data collection that requires more time. Given the time limitation and the need for quantitative data collection, this approach was not suitable for my study. In addition, mixed methods can be used to develop a new instrument and/or complement strengths of a specific design (Moizer, Carter, & Liu, 2015; Park & Park, 2016; Williams & Gemperle, 2017). I did not seek to develop a new instrument given that the study was focused on the experiences of corporate data managers. Therefore, the mixed-methods approach was not appropriate for this study of data governance frameworks in the banking industry.

The quantitative approach includes a research question and hypotheses (Moizer et al., 2015; Park & Park, 2016; Williams & Gemperle, 2017). The quantitative approach is used to examine relationships or differences among variables to test hypotheses (Park & Park, 2016; Venkatesh et al., 2013). A quantitative approach is appropriate for studies that include numerical data from a large number of participants when variables are known and measurable (Park & Park, 2016; Williams & Gemperle, 2017). The current study was not focused on identifying relationships between variables, as the purpose was to explore the strategies that successful corporate data managers in some banks used to implement data governance frameworks to reduce operational costs and risks. Quantitative methods were not appropriate because the details about the strategies of the corporate data managers could not be obtained using standardized instruments. Therefore, the quantitative approach was not appropriate for the study of data governance frameworks in the banking industry.

Research Design

There are several types of qualitative research designs, including narrative, phenomenology, ethnography, and case study (Buckley, Ali, English, Rosik, & Herold, 2015; Clayton, 2016; Shenhav, Oshri, Ofek, & Sheafer, 2014). A narrative design is appropriate when a researcher seeks to conduct a biographical study of individuals (Poulsen & Carmon, 2015; Shenhav et al., 2014; Wehner & Thies, 2014). A researcher uses stories, literature, autobiography, letters, field notes, and conversations to analyze the significance of the lives of the participants as narratives (Poulsen & Carmon, 2015;

Shenhav et al., 2014; Wehner & Thies, 2014). I did not seek to conduct a biographical study, therefore, the narrative design was not appropriate for my study.

A phenomenological design can be used by researchers who would like to explore individuals' life experiences to understand the essence of a phenomenon (Blumen, 2015; Clayton, 2016; Ritch, 2015). In a phenomenological study, researchers use interviews to collect data to understand real-life experiences (Blumen, 2015; Clayton, 2016; Venkatesh et al., 2013). This approach was not appropriate because the current study did not focus on the lived experiences of the participants to explore the essence of a phenomenon; rather, the study's focus was to explore multiple cases for common themes. An ethnographic design is suitable for researchers who seek to observe and understand a group's or organization's culture (Crampton, 2016; Robinson & Shumar, 2014; Vesa & Vaara, 2014). Because the current study's focus was different from the focus of ethnography and the research not concerned with exploring a unique phenomenon based on the experiences of a specific cultural or ethnic group, ethnography was not an appropriate research design.

In a case study, a researcher uses multiple data sources to examine perspectives of participants to determine how participants made decisions and gained information about an experience (Buckley et al., 2015; Durugbo & Erkoyuncu, 2016; Scott & Halkias, 2016). A case study can allow a researcher to focus on how experts in the industry solved a business problem and reduced or eliminated an adverse impact on business operations (Buckley et al., 2015; Durugbo & Erkoyuncu, 2016; Scott & Halkias, 2016). I used a

multiple case study design to explore and understand strategies for data governance frameworks in the banking industry.

In qualitative studies, data saturation is necessary, and researchers achieve data saturation by continuing to gather data until no new findings emerge (Boddy, 2016; Kalla, 2016; Zakrison et al., 2015). Researchers should conduct interviews until no new data are collected (Boddy, 2016; Kalla, 2016; Zakrison et al., 2015). A researcher can assess that he or she has reached data saturation when there are enough data to duplicate the study (Boddy, 2016; Fusch & Ness, 2015; Kalla, 2016; Zakrison et al., 2015). I continued interviewing the selected participants until no new information was provided. After interviewing seven participants, I achieved data saturation.

Population and Sampling

Purposive sampling is a technique of sampling participants based on characteristics such as field expertise and number of years of experience in the field (Boo, Carruthers, & Busser, 2014). In purposive sampling, a researcher chooses participants who are qualified based on the set criteria to participate in the study (Pradana & Salehudin, 2015). The purposive sampling technique enables a researcher in a case study to select participants who can provide the expert knowledge on the study subject (Pradana & Salehudin, 2015; Sharma, Aima, & Sharma, 2015). I used purposive sampling to select participants from three banks based on participants' expert knowledge in the field of data governance frameworks.

Convenience sampling is a method by which a researcher selects a sample population based on the accessibility and subject knowledge of participants (Boddy,

2016; Poulsen & Carmon, 2015; Yin, 2014). Criterion sampling is a sampling method by which a researcher selects a sample population based on specific selection conditions of the study subject and participants (Boddy, 2016; Poulsen & Carmon, 2015; Yin, 2014). I used both convenience and criterion sampling to select seven corporate data managers from three banks located in North Carolina and New York who had developed effective strategies to implement data governance frameworks to reduce operational risk and cost. I selected middle, high, and executive level corporate data managers from three banks. Mid-level managers typically have 5 or more years of experience in the relevant field of expertise (Bandow & Self, 2016; Behrens & Patzelt, 2016; Glaser, Fourne & Elfring, 2015). Mid-level corporate data managers were subject matter experts and leaders in the implementation and enforcement of data governance frameworks. High-level managers typically have 10 or more years of experience in the relevant field of expertise (Bandow & Self, 2016; Behrens & Patzelt, 2016; Glaser et al., 2015). High-level corporate data managers were subject matter experts in designing, leading, and enforcement of the data governance frameworks. Executive level data managers are key leaders in the organization that are responsible in the critical decision-making process for strategic program initiatives (Khatri & Brown, 2010; Smallwood, 2014). Executive level data managers were key leaders in the organization that were strategic decision makers and responsible of the implementation of data governance frameworks. In a qualitative case study, a sample size range can vary depending on the data saturation attainment point (Boddy, 2016; Kalla, 2016; Yin, 2014). A researcher can determine the point of saturation by assessing characteristics of achieving data: when no new themes and codes

emerge, no new data are found, and a researcher can replicate the study (Boddy, 2016; Fusch & Ness, 2015; Kalla, 2016). Sampling three mid-level, two high-level, and two executive level corporate data managers provided sufficient data to attain data saturation. I conducted five face-to-face and two Skype Video interviews based on the availability of the participants.

Ethical Research

I initiated the process of recruiting and interviewing corporate data managers after IRB approval (IRB approval number 03-23-18-0415095). I emailed a consent form to all research participants. A consent form is essential to the research because it provides evidence of participant's agreement and respect, and protects rights of participants (Blee & Currier, 2011; Greenwood, 2016; Nagasaka et al., 2016; Yin, 2014). The informed consent form covered important information such as nature and purpose of the research study, confirmation of IRB approval, and disclosure regarding the confidentiality of participant's responses. This allowed participants to understand what was being explored prior to their participation in the study.

I informed participants that their participation is voluntary, and they have a right to withdraw from the study at any time without notification. It also indicated and explained that there will be no incentives provided to participants for their participation in the study. All those involved in the study signed the consent form before I conducted interviews. A researcher must maintain the privacy of the participants and mask any identifiable information by using codes (Greenwood, 2016; Nagasaka et al., 2016; Yin, 2014). As a researcher, I maintained the privacy of corporate data managers and

organizations where corporate data managers worked by not including the name and place of work. A researcher must inform participants of any potential risks (Nagasaka et al., 2016; Yin, 2014). I followed the Walden University's IRB ethical and legal requirements and informed participants that being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as minor stress. Being in this study would not pose a risk to your safety or wellbeing. A researcher should withhold personal bias as much as possible to provide high-quality, ethical research, and should focus on experiences of subject matter experts (Blee & Currier, 2011; Greenwood, 2016; Partridge & Allman, 2016; Yin, 2014). I kept personal bias out as much as possible, by avoiding leading questions and sticking to the pre-determined questions, unless required to follow-up with other questions in order to provide high-quality, ethical research by focusing on capturing experiences of corporate data managers. The ethical focus was on ensuring that data was gathered and analyses were done without personal bias and with the purpose of identifying strategies based on information provided.

A researcher must evaluate ethical standards in research, because ethical standards are critical to increasing the quality of the study and protecting the privacy of participants (Blee & Currier, 2011; Greenwood, 2016; Partridge & Allman, 2016; Yin, 2014). As a researcher, I ensured that all participants meet IRB requirements, and I ensured that participants fully understand objectives and protocols of the study before the interview process. I maintained the privacy of all participants by assigning a letter and number to each participant. I assigned letters EM, PH, PM, and a number to each participant. Letters EM1 represented participant one executive-level corporate data

manager, letters PH1 represented participant one high-level corporate data manager, and letters PM1 represented participant one mid-level corporate data manager. I stored research data in a password-protected storage device, and I will keep the data in a secured password protected Universal Serial Bus (USB) storage device for next five years. Confidential paper records are stored and locked in a cabinet where only I have access to this storage. All records will be disposed of properly through deleting the files and shredding paper records five years after the publication of the study.

Data Collection Instruments

As a researcher, I served as the primary instrument for data collection. In a qualitative case study, a researcher can act as a data collection instrument because a researcher can gather data through the interview process (Bolte, 2014; Fleet et al., 2016; Nagasaka et al., 2016). Open-ended questions can allow participants to provide in-depth answers and a researcher should not ask leading questions in a qualitative case study during the interview process to avoid bias (Bolte, 2014; Fleet et al., 2016; Nagasaka et al., 2016). To avoid bias, interview questions were open-ended, and there were no leading questions. In qualitative methods, a researcher can use semistructured interviews to explore themes and information from participants: semistructured interviews are suitable for pre-determined interview questions, and the interview process can allow participants to provide thoughtful information (Fleet et al., 2016; Mojtahed, Nunes, Martins, & Peng, 2014; Nagasaka et al., 2016). I conducted semistructured interviews using pre-determined interview questions to gather information from the participants. A researcher should use a interview protocol to add consistency in a case study (Bolte, 2014; Fleet et al., 2016;

Onwuegbuzie & Hwang, 2014). I used an interview protocol (see Appendix B) as a interview guide and it added consistency to the qualitative research process.

A researcher should ask follow-up questions and clarify unclear information during the interview process (Fleet et al., 2016; Mojtahed et al., 2014; Nagasaka et al., 2016). A researcher should review data collected through interviews with participants to make sure there are no gaps in the information (Fleet et al., 2016; Mojtahed et al., 2014; Nagasaka et al., 2016). During each interview, I asked follow-up questions, and seeked clarifications on terms that were foreign to my knowledge. After each interview, I sent each participant a transcript of their interview via email and asked participants to review it to ensure I collected complete and accurate information.

To ensure reliability and credibility in doing data gathering, researchers ask the same interview questions to each participant: asking same questions to each participant in a same order allow researchers to identify themes, and to efficiently organize and analyze the interview data (Bredart, Marrel, Abetz-Webb, Lasch, & Acquadro, 2014; Mojtahed et al., 2014; Nagasaka et al., 2016). I asked the same open-ended interview questions in the same order to each participant to enhance the credibility and reliability of data. In a qualitative study, a researcher can use data or methodological triangulation to facilitate reliability and validity of the research data (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). Data triangulation involved gathering multiple perspectives from different participants from a different level in the same industry (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). Methodological triangulation process involved gathering data from more than one source to increase research assurance and to reduce

bias (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). I used a multiple study research design. I selected three types of participants from three different banks. The three categories of participants were middle, high, and executive level corporate data managers. The use of three types of participants allowed me to perform data triangulation on multiple perspectives to facilitate reliability and validity of the research data. Other sources of data included non-confidential bank documentation and the BCBS 239 compliance documentation. An assessment of existing non-confidential bank documentation mitigated the chance of bias, and support the methodological triangulation.

A member-checking method is used to achieve research validity, and it can help in reducing bias (Birt, Scott, Cavers, Campbell, & Walter, 2016; Houghton, Casey, Shaw, & Murphy, 2013; Yin, 2014). A researcher can use the member-checking method as a quality control process to make sure research data does not include incorrect information due to researcher misunderstanding (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). I met a second time with each participant face-to-face and Skype Video to discuss interpretations of the interview. The second meeting served as a member-checking method and provided confirmation, clarifications, and assurance to the interview data. I incorporated final edits and clarifications received during member-checking meetings in themes and final study.

Data Collection Technique

I started the data collection process after I received the IRB approval. After I received signed consent form from each participant, I sent interview questions via emails

prior to the interviews. I asked each participant to provide few dates and time slots that can work best based on each participant's availability for a face-to-face or Skype Video interview. After I received interview schedule options from each participant, I scheduled a face-to-face or Skype Video interview with each participant. I conducted five face-to-face and two Skype Video semistructured interviews with seven corporate data managers from three banks located in North Carolina and New York. Each interview took place in a private non-work location in North Carolina and New York. There are few advantages and disadvantage of this data collection technique. Advantages includes, semistructured interviews are a good practice to explore in-depth information from participants through open-ended interview questions and dialog because open-ended dialog can support an interactive approach to conduct a meaningful discussion and gather thoughtful information (Fleet et al., 2016; Mojtahed et al., 2014; Nagasaka et al., 2016). This technique allows a researcher to observe the physical reaction of participants when they provide answers to the interview questions (Nagasaka et al., 2016). A researcher can observe the confidence level of a participant by assessing the comfort level of a participant through physical reaction during a face-to-face interview (Fleet et al., 2016; Nagasaka et al., 2016). I used open-ended interview questions. I had meaningful interactions with each participant and I observed that each participant was very comfortable during the interview. Some disadvantages of semistructured interviews include lack of interviewer's experience to conduct interviews (Aladag, 2017). Also with this type of interview, the researcher must continue the interview process until data saturation is achieved (Azarpazhooh, Ryding, & Leake, 2008), and it requires interview

preparation planning, and face-to-face interviews can be a prolonged process because participants' schedules may conflict with the interviewer's schedule (Yin, 2014). To overcome some of these weaknesses, Lora et al. (2016) and Yin (2014) suggested that an interviewer should conduct practice interviews before conducting actual interviews and seek multiple time slots for face-to-face interviews. Osteraker (2001) suggested that an interviewer should use an interview protocol to achieve consistency and read material on interview strategies to self-prepare before conducting interviews. I work as a program manager at my current company and part of my job is to conduct semistructured interviews with subject matter experts on a regular basis, apart from having experience conducting semistructured interviews I conducted practice interviews with my mentor using interview protocol (see Appendix B) as a guide. I read academic journals referenced above to educate myself on interview techniques, I requested multiple time slots for face-to-face and Skype Video interviews, and I used an interview protocol (see Appendix B) during each interview to achieve consistency and to overcome weaknesses of interview techniques.

Recording and taking notes in the interview process are two methods used widely by researchers (Bredart et al., 2014; Mojtahed et al., 2014; Yin, 2014). Researchers should reconcile interview notes with recordings and then review and confirm final interview draft notes with each participant to enhance the validity and credibility of the information (Bredart et al., 2014; Mojtahed et al., 2014; Yin, 2014). If a participant is not comfortable recording the interview session, then a researcher should take ample notes and confirm notes with participants to make sure the researcher captured accurate and

complete information (Bredart et al., 2014; Houghton et al., 2013; Mojtahed et al., 2014; Yin, 2014). I conducted semistructured interviews with all participants. I asked participant's permission to record the audio prior to recording each interview. I also took notes during each interview. I used open-ended interview questions and asked follow-up questions to gather in-depth information from participants. Each interview lasted between 45 minutes to one hour. Duration of the interview depended on the need for follow-up questions.

I used a voice-to-text recorder and reconcile notes from each interview with text from recordings. I used Dragon NaturallySpeaking application to transcribe the recording into text. A researcher should reconcile recordings with the transcribed text for accuracy and completeness of the information as a good practice (Bredart et al., 2014; Mojtahed et al., 2014; Yin, 2014). I listened to each recording and reconciled with the transcribed text for accuracy and completeness of the information gathered during each interview.

To determine if reliability and credibility have been achieved and to mitigate bias, a researcher can use data and or methodological triangulation in a multiple study (Constantino & Kate, 2009; Perkmann & Schildt, 2015; Yin, 2014). Data triangulation involves a process of gathering multiple perspectives from different level participants in the same industry (Constantino & Kate, 2009; Perkmann & Schildt, 2015; Yin, 2014). Methodological triangulation is a process of gathering data from multiple sources for the validity of data to increase research assurance and to reduce bias (Constantino & Kate, 2009; Perkmann & Schildt, 2015; Yin, 2014). The study of data governance framework was a qualitative multiple study, and I utilized three types of participants: three middle,

two high, and two executive level corporate data managers from three different banks. The use of three types of participants provided multiple perspectives to facilitate reliability and validity of the research data to attain data triangulation.

Constantino and Kate (2009) and Yin (2014) suggested that researchers could request additional documents from participants as supplementary evidence to support methodological triangulation during semistructured interviews. Perkmann and Schildt (2015) suggested that researchers could obtain publically available documents from the official internet site of a company. To support the methodological triangulation, I did an assessment of existing non-confidential bank documentation on the data governance framework and the BCBS 239 compliance documents to mitigate the chance of self-reporting and bias from the interview data. I requested non-confidential bank documents during interviews and ask participants to email me the documents. I obtained the BCBS 239 compliance documentation from the internet site https://www.bis.org; this internet site is the official homepage of the Bank for International Settlements. I obtained these documents as additional information for the purpose of the study. The assessment of existing bank documentation, the BCBS 239 compliance, and responses from participants provided an extensive evidence to assist data validation process. This process also helped me to have a better understanding of the current processes in place for banks.

A researcher should conduct a transcript review of the data collected through interviews with participants to enhance validity and credibility of the information and to make sure there are no gaps in the information (Fleet et al., 2016; Mojtahed et al., 2014; Nagasaka et al., 2016). After each interview, to enhance the validity and credibility of the

information I sent each participant a transcript of their interview via email and asked participants to review it to ensure I collected complete and accurate information. I requested each participant to provide edits and or clarifications where needed. Once I received confirmation, edits, and or clarifications in the interpretation of research data from all participants, I scheduled a second meeting with each participant to discuss interpretations of the interview. A researcher can use the member-checking method as a quality control process to achieve research validity and credibility (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). A member-checking method can assure there is sufficient authentication of the data gathered through interviews by reviewing the data with participants (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). I utilized the member-checking method,;I met second time with each participant face-to-face and Skype Video to discuss interpretations of the interview. The second meeting served as a member-checking method and provided confirmation, clarifications, and assurance to the interview data. I incorporated final edits and clarifications received during member-checking meetings in themes and final study.

Data Organization Technique

Data organization is a critical process of the research, and efficient data organization techniques can save time during the data analysis and interpretation phase of the research (Johnston, 2006; Mojtahed et al., 2014; Nagasaka et al., 2016; Zwijze-Koning & de Jong, 2005). A researcher can use an ID method to store information for easy access (Johnston, 2006; Mojtahed et al., 2014; Zwijze-Koning & de Jong, 2005). I stored each participant’s response into Microsoft Word, and I saved each file using an ID.

I saved each audio file using an ID. To maintain the privacy of all participants, I assigned a letter and number to each participant. I assigned letters EM, PH, PM, and a number to each participant. Letters EM1 represented participant one executive-level corporate data manager, letters PH1 represented participant one high-level corporate data manager, and letters PM1 represented participant one mid-level corporate data manager.

I removed any personal information from the interview responses, and uploaded final response documents into QSR NVivo. I categorized data, and I used categories as nodes in the QSR NVivo for theme generation process. I organized consent forms, interview audio files, drafts and final transcripts and interpretations based on the participant ID assignment. I stored signed consent forms, interview audio files, drafts, final transcripts and interpretations, non-confidential bank documents and the BCBS 239 compliance documentation in a password protected USB storage device. I stored hard copies of all interview related material, non-confidential bank documents, BCBS 239 compliance documentation, and USB storage device in a fireproof locked cabinet. I will keep paper copies and USB storage device for next five years in a fireproof locked cabinet. After five years of the retention period, I will destroy the USB storage device and shred paper copies.

Data Analysis

Data analysis is a critical component of the qualitative research: data analysis is a process of analyzing data manually and or using computer applications (Marshall, Cardon, Poddar, & Fontenot, 2013; Vaughn & Turner, 2016; Yin, 2014). Data analysis involves a process to identify common themes and codes to explore integrity in data

collected through the interview process (Marshall et al., 2013; Vaughn & Turner, 2016; Yin, 2014). I utilized thematic analysis, which is a process used in qualitative research focused on examining themes in the data (Marks and Yardley 2004). The process involves detecting, examining, and recording patterns within the data (Braun & Clarke, 2006; Guest & MacQueen, 2008). Yin (2014) suggested a five-step thematic data analysis technique that includes a collection of data, deconstruction of data, reconstruction of data, analysis of data, and concluding the data. This approach is viable for researchers that pursue to explore using interpretations. The use of thematic data analysis allows researchers to link the various concepts and opinions of participants as well as compare these with each other to identify common themes and contrasting perceptions and experiences (Alhojailan, 2012).

In a qualitative multiple study, a researcher can use methodological triangulation to conduct data analysis (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). Methodological triangulation is a process that involves using multiple sources of data to conduct the research analysis (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). Methodological triangulation is useful in providing confirmation and validity of data (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014).

I used methodological triangulation to conduct data analysis through assessment of non-confidential bank documentation, the BCBS 239 compliance documentation on data governance frameworks, and interview data. I uploaded non-confidential bank documentation, the BCBS 239 compliance documentation, and interview transcribed data into QSR NVivo. QSR NVivo is computer software to analyze data, and researchers use

it to create codes through the creation of nodes (Johnston, 2006; Yin, 2014; Zamawe, 2015). The process of nodes creation results in generating coding of data in QSR NVivo (Johnston, 2006; Yin, 2014; Zamawe, 2015). Coding can help a researcher investigate relevant information in the interview transcript (Marshall et al., 2013; Vaughn & Turner, 2016; Yin, 2014). A researcher can utilize data analysis process to find keywords or codes that can help a researcher identifying data representation, in-depth evaluations of themes, trends, and or a conveyed message (Marshall et al., 2013; Vaughn & Turner, 2016; Yin, 2014). To identify and compare patterns in the research data, a researcher can use the thematic coding framework in a case study design (Marshall et al., 2013; Vaughn & Turner, 2016; Yin, 2014).

The thematic coding framework is useful in the organization of data that can help a researcher to conduct meaningful analysis in an organized and simplified manner that can help in effective analysis through reduced data analyses errors (Marshall et al., 2013; Vaughn & Turner, 2016; Yin, 2014). I utilized Yin's (2014) thematic coding analysis framework. First, I collected data to develop groups. Once data grouping was complete, then I deconstructed data by removing invariant themes. For the next step, I reconstructed the data to group primary themes. For data analysis, I checked patterns against non-confidential bank documentation, the BCBS 239 compliance documentation, and interview transcribed data to construe and synthesize the meaning of the data. In the conclusion step, I condensed the data into the individual critical narrative of experiences. I generated codes manually to test the validity of the QSR NVivo computer software. My working process of developing codes in the interview transcript, non-confidential bank

documentation, and the BCBS 239 compliance documentation was that at first, I analyzed patterns in non-confidential bank documentation, the BCBS 239 compliance documentation, and interview transcripts then I identified codes. I selected chunks of data, and I applied codes. I used codes to create themes. This process helped me identify responses to a specific interview question. Initially, I identified all possible themes, then through further evaluation, I categorized themes into appropriate buckets. The manual process and the use of QSR NVivo computer software generated similar themes. Through the data analysis process, I found five major themes. Themes were (a) leadership role in data governance frameworks to reduce risk and cost, (b) data governance strategies and procedures, (c) accuracy and security of data, (d) establishment of data office, and (e) leadership commitment at the organizational level. Presentation and interpretations of the study results might lead to an informed understanding of effective strategies that might enable corporate data managers to implement data governance frameworks to reduce operational costs and risks in the banks.

Five themes from the data analysis correlated with the key themes from the literature review and conceptual framework. The conceptual framework for this study was servant leadership. Greenleaf (1977) authored servant leadership theory. A servant leader is someone who chooses to serve others first, making a conscious decision to lead with a focus on caring for others (Greenleaf, 1977). The data analysis showed that servant leaders are best suited to implement change in the organization through inspiration and encouragement. In the literature review, section 1, I analyzed and discussed various sources that connect to this study. Data collected through interviews, review of bank

documentation on data governance frameworks, and the BCBS 239 compliance documentation aligned with themes presented in the literature review of this study. In section 3, I reviewed and analyzed new studies published since I wrote the proposal to correlate key themes with the literate review and the conceptual framework. I also searched for new studies using the Walden University library. In my analysis of the new studies, I was able to confirm themes discovered in the literature review and the conceptual framework. In conclusion, servant leaders might be more likely to be successful in implementing data governance frameworks to reduce operational costs and risks in the banks because servant leaders place employees, customers, and their community as the priority.

Reliability and Validity

Research data reliability and validity are achieved through data saturation, member checking, data triangulation, or methodology triangulation (Bredart et al., 2014; Constantino & Kate, 2009; Fusch & Ness, 2015; Yin, 2014). Data reliability and validity play important roles in eliminating bias and minimizes errors in the research data (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). Data saturation is achieved by continuing to gather more information until no new themes emerged through the interview process (Fusch & Ness, 2015; Kalla, 2016; Zakrison et al., 2015). Researchers can achieve reliability of research data through data saturation and data saturation is achieved when research no longer provides new information and a researcher has enough information that he or she can duplicate the research (Boddy, 2016; Kalla, 2016; Zakrison et al., 2015).

However, for qualitative research, Guba and Lincoln (1981) changed validity and reliability with the equivalent perception of “honesty,” containing four facets: dependability, credibility, transferability, and confirmability. Dependability emphasizes the need for accountability on the part of the researcher regarding the changing context that happens during the research. The researcher is accountable in describing any change that occurs in the setting and how this affects the approach of the study. Credibility refers to establishing results that are authentic from the viewpoint of the contributors in the research. When a qualitative approach is done from the perspective of the participants, they are the ones who can assess the credibility of the results. Transferability pertains to the point to which findings of the study can be transferred or generalized to additional situations and perspective. Confirmability signifies to the point to which results of a study can be inveterate or validated by others (Guba & Lincoln, 1981; Guba & Lincoln, 1982). Dependability is usually achieved through ensuring that the researcher reports each process in detail to ensure that future researchers are able to repeat the study, and results are similar (Guba & Lincoln, 1981; Guba & Lincoln, 1982). I ensured that each process and step that was done in the study was captured correctly in the narrative to allow future researchers to replicate the study.

Research using open-ended questions can enhance the reliability of the research data; open-ended questions allow participants to provide in-depth answers that can avoid participant bias and enhance the credibility and reliability of the data (Bolte, 2014; Fleet et al., 2016; Nagasaka et al., 2016). All questions in the study were open-ended, which allowed participants to provide in-depth answers that enhanced the credibility and

reliability of data. Credibility can be addressed through researchers using the transcript review and or member-checking method as a quality control method to achieve research data validity and credibility (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). A researcher should conduct a transcript review of the data collected through interviews with participants to enhance validity and credibility of the information and to make sure there are no gaps in the information (Fleet et al., 2016; Mojtahed et al., 2014; Nagasaka et al., 2016).

A researcher can also utilize a member-checking method that allows a researcher to validate collected interview data with other authors' data (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). Member-checking can serve as a validation step to make sure the researcher did capture and interpret the information for the intended purpose of study (Birt et al., 2016; Houghton et al., 2013; Yin, 2014). From a participant perspective, member-checking allows participants to provide a final review, edits, and confirmation on the interview data and how it contributes to improving the accuracy of the interview data (Birt et al., 2016; Houghton et al., 2013; Yin, 2014).

As a researcher, I utilized transcript review and member-checking methods to assure that I captured sufficient authentication of the data gathered through interviews. After I drafted each interview transcript, I emailed the draft to an appropriate participant for review and validation. I added clarifications in the email correspondence. I asked each participant to provide edits and clarifications. After I received responses from each participant via email, I reviewed edits and clarifications and then I set up second and final interviews. I met a second time with each participant face-to-face and Skype Video to

discuss interpretations of the interview. The second meeting served as a member-checking method and provided confirmation, clarifications, and assurance to the interview data. I incorporated final edits and clarifications received during member-checking meetings in themes and final study.

The research assumptions, limitations, delimitations, and persistent sampling provided should include sufficient context to determine the transferability of the data governance frameworks study by other researchers (Houghton et al., 2013; Marshall & Rossman, 2016; Yin, 2014). In qualitative research, transferability of the generalization of the research outcomes applies to a researcher other than the original researcher (Houghton et al., 2013; Marshall & Rossman, 2016; Yin, 2014). Researchers can enhance transferability by ensuring that description of the research context and assumptions are thoroughly explained (Houghton et al., 2013). The person who aims to transfer the results of this study to another context or setting will be responsible for judging how sensible the transfer of these findings is to a different setting. I ensured research context and assumptions were well defined in the study to provide future researchers enough details should they wish to replicate my study. Confirmability can be enhanced through a number of strategies. Researchers can manuscript the measures for checking and rechecking the information in the study (Yin, 2014). Other researchers can serve as "devil's advocate" in discussing the results, and this process can be documented. Another approach involves actively searching for and describing negative instances that dispute prior findings. Researchers can utilize the member-checking method to validate collected interview data (Houghton et al., 2013; Marshall & Rossman, 2016).

Methodological triangulation is suitable for a qualitative case study to facilitate validity and reliability of the research data (Constantino & Kate, 2009; Perkmann & Schildt, 2015; Yin, 2014). Methodological triangulation uses multiple data sources to increase research assurance and to reduce bias (Constantino & Kate, 2009; Perkmann & Schildt, 2015; Yin, 2014). I used data and methodological triangulation to facilitate reliability and validity of the research data and to reduce bias. Data triangulation is a process of gathering multiple perspectives from different participants in the research (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). The methodological triangulation is a process of gathering data from multiple sources to enhance the validity (Bredart et al., 2014; Constantino & Kate, 2009; Yin, 2014). The use of a multiple study research design allowed three types of participants from three different banks. Middle, high, and executive level corporate data managers participated in the semistructured interview process to contribute to the research data. I achieved data triangulation by the usage of three types of participants who offered numerous viewpoints to facilitate reliability and validity of the research data. Multiple perspectives of participants from three different banks reduced participant bias.

To achieve the methodological triangulation to mitigate the chance of self-reporting bias from the interview data, I assessed existing nonconfidential bank documentation on the data governance frameworks and the BCBS 239 compliance. I strictly followed the data collection method, ethical research, research method, data analysis techniques, and research design described in Section 2 of this study. I achieved

confirmability of the research data through member-checking, data saturation, and methodological triangulation.

Transition and Summary

In Section 2, I provided detailed information on the methodology, including the design, data collection and data organization, and the analysis process. Servant leadership was used as a conceptual framework. Section 2 provided an overview of the research project, which included the purpose statement, role of the researcher, participants, the research method and design, population and sampling, ethical research, data collection instrument and technique, the data organization technique, data analysis, and the reliability and validity of the study.

The specific business problem was that some corporate data managers in banks lack strategies to implement data governance frameworks to reduce operational costs and risks. The purpose of this qualitative multiple study was to explore the strategies that successful corporate data managers in some banks used to implement data governance frameworks to reduce operational costs and risks. The research question that guided the study was: What strategies do corporate data managers use to implement data governance frameworks to reduce operational costs and risks? The target population consisted of seven corporate data managers in three banks located in North Carolina and New York who have developed effective strategies to implement data governance frameworks in their organizations to reduce operational costs and risks. The use of a transcript review, member-checking, and methodological triangulation ensured the validity and reliability of the study.

In Section 3, I provided an introduction to the study and presentation of findings. This section also included application to professional practice, implications for social change, recommendations for action and future research, a reflection of my experiences conducting this study, and my research conclusions. The ensuing results from the study might enable corporate data managers to implement data governance frameworks to reduce operational costs and risks in the banks.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this qualitative multiple case study was to explore the strategies that successful corporate data managers in banks used to implement data governance frameworks to reduce operational costs and risks. The participants were seven corporate data managers in three banks located in North Carolina and New York. Sampling included two executive-level, two high-level, and three mid-level corporate data managers who provided sufficient data to attain saturation. The results showed different strategies that corporate data managers used to implement data governance frameworks in their organizations to reduce operational costs and risks. The corporate data managers emphasized the critical need for, and contribution of, IT infrastructure design, knowledge of banking regulations, employee training, data security measures, data reliability and accuracy measures, and data office establishment in data governance frameworks. The corporate data managers reported that teams who were open to the adoption of change succeeded during the implementation and business-as-usual phase of data governance frameworks. The corporate data managers indicated that both technical and effective leadership skills are critical to implementing and leading initiatives of data governance frameworks. The corporate data managers emphasized that a leader's ability to influence and implement change is critical in implementing data governance frameworks because frameworks consist of people, processes, and technology.

Presentation of Findings

The research question that guided the study was the following: What strategies do corporate data managers in banks use to implement data governance frameworks to

reduce operational costs and risks? I conducted semistructured interviews and examined documents. The main data analysis method I used was thematic analysis. Five major themes emerged during data analysis: (a) leadership role in data governance frameworks to reduce risk and cost, (b) data governance strategies and procedures, (c) accuracy and security of data, (d) establishment of a data office, and (e) leadership commitment at the organizational level.

In Section 3, I discussed each major theme and subthemes. I also interpreted the findings using the conceptual framework and the existing literature on effective business practice. A list of major themes and subthemes and the number of participants who offered each perception are presented in Table 1.

I maintained the confidentiality of all participants by assigning a letter and number to each participant. I assigned letters EM, PH, PM, and a number to each participant. The letter and number combination EM1 represented Participant 1 executive-level corporate data manager, PH1 represented Participant 1 high-level corporate data manager, and PM1 represented Participant 1 mid-level corporate data manager.

Table 1

Major Themes and Subthemes Based on the Data

Primary Theme	Subtheme	Number of participants with this perception
	Active Leadership Participation	4

Leadership Role in Data Governance Frameworks to Reduce Risk and Cost	Risk Management to Reduce Risk and Cost	4
Data Governance Strategies and Procedures	Change Management Process	3
	Strategies to Optimize IT Infrastructure	5
	Strategies to Manage IT Risk	4
Accuracy and Security	Data Accuracy and Validity through Data Testing	6
	Data Security	3
Establishment of Data Office	Data Office at a Strategic Level	3
	Data Office at a Functional Level	5
Leadership Commitment at the Organizational Level	Resolve Challenges through Leadership	4
	Organizational Change Through Leadership	5

Theme 1: Leadership Role in Data Governance Frameworks to Reduce Risk and Cost

The first theme that emerged from the findings was the leadership role in data governance frameworks to reduce risk and cost. Promoting a healthy, collaborative corporate culture that enables leaders to guide their teams to achieve corporate goals benefits both short- and long-term initiatives (Chia-Huei & Zhen, 2015). This theme highlights the participants' perceptions that leaders play a critical role in the data governance framework's design and implementation. Participant EM2 stated,

> We had old process and procedures to manage risk and cost was on the rise. The challenge was how to convince group leaders to adapt to new ways to govern data and manage risk. Being a large organization, our processes were very much interconnected. I worked with each group leader and listened to their needs and developed data governance frameworks. I created a welcoming environment and encouraged all stakeholders to share their needs. One thing I completely avoided is that I did not build process in a vacuum.

Change is critical for innovation and can be difficult to implement because organizational processes, practices, and goals are interconnected (Avila & Garces, 2017). According to Grody and Hughes (2016), data governance frameworks require changes in the process and technology to govern and manage data in a data-driven organization. Leaders who support change through influence and encouragement achieve success during a major organizational change because they can bring diverse teams to work together to achieve common goals (Gandolfi, Stone, & Deno, 2017). I learned from the

data collected that leaders who actively participated in understanding the concerns of their teams and promoted a collaborative organizational culture achieved success in designing and implementing data governance frameworks. Two subthemes emerged: active leadership participation and risk management to reduce risk and cost.

Subtheme 1.1: Active leadership participation. The first subtheme was active leadership participation. An essential part of the organizational culture is leaders who take an active part in data governance framework design and implementation. Particularly important is bringing together disparate groups, listening to their ideas, and getting them to work toward common goals. Through decision-making and prioritized planning, leaders are central to reducing intergroup conflicts that arise from the implementation of new initiatives (Gandolfi et al., 2017). Participant EM1 stated,

> We had big challenges during the initial phases of the framework design and implementation. The challenges were due to the large group participation because each group worked at a different pace and had different priorities. Each group was busy with their regular daytime jobs and did not have time to participate in long design sessions.

Participant PH1 stated, “Some data managers disagreed during the brainstorming sessions because they wanted to promote their group agendas and lost sight of the big picture.” Participant EM1 stated, “Getting buy-in from a leader of each group was the strategy that worked well and reduced conflicts.” Similarly, Participant PM3 stated, “We worked individually with each group manager to listen and assess their concerns, and

then we worked with their senior leaders to make rational decisions based on the outcome of individual discussions with each group manager." Participant PH2 stated,

> We mandated attendance of key decision-making bodies. We understood early on that we need time from key subject matter experts and that is why we provided additional resources to help manage their workload. We also spent the time to set priorities in advance to manage workload. We encouraged subject matter experts by creating a welcoming environment where they freely shared their ideas.

Participants' statements resonated with Weiss's (2018) assertion that when many groups are involved in the decision process, issues tend to arise and group leader buy-in is necessary to move forward with initiatives by setting priorities in advance to avoid conflicts. Gandolfi et al. (2017) stated that servant leaders can drive a critical conversation to get mutual agreements through negotiations and setting agenda priorities, which can also reduce conflicts. According to Bashir and Azam (2016), a corporate culture that allows team members to share their ideas freely opens doors for innovation and creates a welcoming environment. This allows team members to share their ideas with other peers and leaders without hesitation and encourages open dialog (Bashir & Azam, 2016). In the next subsection, I discuss the second subtheme of risk management to reduce risk and cost.

Subtheme 1.2: Risk management to reduce risk and cost. In this study, I found that promoting a corporate culture in which members actively take part in risk management practices is essential to reducing operational risk and cost. Participant EM1

stated, “It is my job as a leader to take an active role in prioritizing considerations of mitigating operational risk.” Participant PH2 stated,

> We take risk management seriously at our bank because we have customer data. High risk of data breach and high cost to maintain data in outdated application systems were two important factors that drove the need for data governance frameworks.

Participant PM2 stated, “We had old outdated systems, and poor IT infrastructure increased the operational risk and data maintenance cost, so we had to come up with a solution to reduce both operational cost and risk.” Similarly, Pimchangthong and Boonjing (2017) stated that poor IT infrastructure increases maintenance cost and data risk. Participant PH1 stated,

> I worked with my peers and senior leaders and formed a corporate culture that understood a critical need to mitigate operational risks. I started lunch-n-learn sessions of risk management practices. My team started companywide monthly newsletters to promote risk awareness and impact on effective business decisions.

Participant PH2 stated, “I met with business and technology managers to develop a robust risk management framework to support data governance frameworks. We standardized our risk management functions through a new risk management framework.” Participant PM2 stated, “We encouraged our key managers to promote a newly implemented risk management framework to achieve consistency in the risk management methodologies. Consistency in the risk management approach helped us reduce operational cost and risk.” This is consistent with the work of Smallwood (2014),

who mentioned that the key to managing risk effectively is to establish a consistent approach for risk management and support from key stakeholders.

To summarize this theme, data from interviews revealed that managers who promote a corporate culture that embraces change and encourages employees to work together as a team to design and implement data governance frameworks were able to improve effective data management practices to reduce operational cost and risk. Adams et al. (2016) stipulated that leaders who promote teamwork achieve success because teamwork creates synergy, reduces conflicts, and fosters the ability to adapt to change. According to Bashir and Azam (2016), servant leaders possess qualities of serving others, and they can build corporate communities that welcome collaboration and change through improved operations and strategic awareness to drive more effective corporate results. Findings from the current study also showed that a corporate culture that is proactive and collaborative is more capable of operationalizing management's vision to achieve more effective corporate performance in designing and implementing data governance frameworks. The theme of a leadership role in data governance framework to reduce risk and cost relates to and confirm themes that emerged in the literature review. The current study findings also relate to the servant leadership conceptual framework. Leaders can promote and encourage an organizational culture that acclimates to change through collaboration and awareness. Increased collaboration and awareness, in turn, leads to the improvement of data governance frameworks to reduce operational risks and costs.

The participants provided the responses to Interview Questions 2 through 10, and from their responses I identified Theme 1 and its two subthemes. Table 2 shows a list of the study participants and how often participants mentioned each subtheme as an effective strategy to implement data governance frameworks to reduce operational costs and risks.

Table 2

Theme 1: Subthemes of Leadership Role in Data Governance Frameworks to Reduce Risk and Cost

Participant	Subthemes	
	Active leadership participation	Risk management to reduce risk and cost
	#	#
EM1	2	1
EM2		
PH1	1	1
PH2	1	2
PM1		
PM2		2
PM3	1	

Theme 2: Data Governance Strategies and Procedures

The second theme that emerged from the data analysis was data governance strategies and procedures to design and implement data governance frameworks. Policies and procedures are important tools to guide organizations; policies and procedures are step-by-step guides for consistency and efficiency (Deshpande, 2016). Deshpande (2016) and Skvarciany and Iljins (2015) stated that policies and procedures are important especially during the establishment of new organizational initiatives. Policies and procedure can provide a road map for day-to-day operations and guide employees to achieve consistency. Theme 2 highlights the participants' perception that the establishment of IT risk management strategies and procedures is necessary to mitigate data and IT risks, optimize IT infrastructure, and achieve consistency in data governance frameworks. Participant EM1 stated,

> I noticed a lack in consistent strategies to assess existing IT infrastructure. Everyone had their procedures and it created misunderstanding among various teams. I held multiple sessions with other group leaders and advised those leaders to establish consistent strategies across teams to assess existing IT infrastructure. My message was well received among other leaders and as a result, we established standard strategies across teams to achieve consistency.

Similarly, participant PM2 stated,

> Lack of procedures led to confusion and inconsistency in the process. We learned in the early stages that we need procedures to achieve consistency, which is why we established templates to gather information on current IT infrastructure and

data usage. This information helped us to optimize IT infrastructure to govern data and mitigate data, and IT risks.

Participant EM1 stated, “We provided several trainings to educate our teams regarding new tools and processes to manage risk.” According to Deshpande (2016) and Sen and Borle (2015), risk management policies and procedures are essential to achieve consistency and to assess and mitigate risks. Similarly, van den Broek and van Veenstra (2018) stated that the use of standard tools and templates could achieve consistency and provide guidance to govern and mitigate data risks.

Three subthemes emerged, change management process, strategies to optimize IT infrastructure, and strategies to manage IT risk.

Subtheme 2.1: Change management process. The first subtheme that developed from the findings was the importance of organizational change management processes. In this study, I found that organizational change management process is critical to managing information technology infrastructure changes to implement data governance frameworks. A bi-weekly change management forum was established to address issues related to data governance frameworks implementation activities. An Enterprise Resource Planning (ERP) solution by SAP was used to track and manage changes related to the design and implementation of data governance frameworks. According to Johnson (2015), organizational changes are not easy and often require a robust change management process to carry out activities effectively to support changes. Changes to information technology infrastructure without a robust organizational change

management process can lead to budget overruns, and cause leaders to lose track of project progress (Avila & Garces, 2017). Participant PH1 stated,

> The very first process I implemented was the organizational change management process to track and manage changes related to the design and progress of new information technology infrastructure to implement data governance frameworks. We had so much going on and we needed a process to track and manage changes related to the data governance design and implementation. I worked with our internal SAP team to customize an SAP-ERP solution for data governance frameworks change management process.

Similarly, participant PH2 stated, “Initially we did not have change management process in place and it created challenges to manage and track the progress of data governance initiatives.” Participant PH1 stated,

> We established a change management process to monitor progress of the implementation of new information technology infrastructure and addressed issues related to budget and resources. We used the change management process to escalate issues to the senior leaders. We established a bi-weekly change management forum and presented issues to the senior leaders. The bi-weekly change management forum enabled project teams and senior leaders to have an open discussion regarding issues related to the implementation activities of data governance frameworks and address such issues in a timely manner.

Participants’ statements resonated with Avila and Garces’s (2017) assertions that a robust change management process can enable organizations to implement technical

and business functional changes effectively through change management process and procedures. Routine change management forums can be used to bring project related issues to the leaders and address such issues efficiently to avoid project failures (Avila & Garces, 2017). Similarly, Johnson (2015) stated that change management is critical because it assists project leaders to track and manage changes through standards tools and procedures efficiently. According to Altamony, Tarhini, Al-Salti, Gharaibeh, and Elyas (2016) ERP tools can be used to track and manage activities related to the organizational changes. ERP tools can be customized per organizational change management requirements. Participant PM1 stated,

> Change management process should be a well thought out process. I would like to say that our change management process is comprehensive because data management disaster recovery procedure is a part of our data governance change management process. We conduct business continuity planning exercises every quarter to be prepared for disasters. After each exercise, we incorporate lessons learned into our change management procedures. As a matter of fact, we actually used it last year when one of our main data servers failed.

Simalrly, Alshammari, Alwan, Nordin, and Abualkishik (2018) stated that a disaster recovery procedure is necessary for business continuity. There should be a standard exercise to prepare teams to mitigate disasters. Disaster recovery procedure can provide the necessary guidance to support critical business functions when disaster situations arise (Alshammari et al., 2018). In the next subsection, I discussed the second subtheme of strategies to optimize IT infrastructure.

Subtheme 2.2: Strategies to optimize IT infrastructure. The second subtheme revealed from an examination of the findings was successful strategies managers used to optimize IT infrastructure. In the study findings reviewed, I found that that optimal IT infrastructure was a critical part of the data governance framework. Participants specified that they worked with corporate data governance office to develop templates to capture, assess and analyze existing IT infrastructure, risks, and controls associated with data. Participant PH2 stated,

> We developed templates to achieve consistency to capture existing IT infrastructure, data risks, and controls. The use of templates to capture existing IT infrastructure from various groups enabled us to develop a robust IT infrastructure design. The current state documents helped us understand the overall IT infrastructure through its flaws and strengths.

Similarly, participant PM3 stated,

> Our success would not have been possible if we did not have a complete picture of our old IT infrastructure. I can tell you honestly that I did not know our data controls were so outdated. So this exercise was very helpful and critical for infrastructure optimization. After we were done documenting the current state of our infrastructure we conducted assessments using flaws and strengths found in the IT infrastructure. Assessments helped us to discover data usage and associated risks with existing controls. We used assessments to make decisions to upgrade IT infrastructure design.

According to Lunardi, Gastaud Macada, Becker, and Van Grembergen (2017) and Pimchangthong and Boonjing (2017), assessment of existing risks and IT infrastructure is a good practice to analyze current capability and limitations of application systems. The assessment of legacy IT infrastructure can help to enhance IT infrastructure for optimization by understanding the current state and then design a new IT infrastructure to overcome deficiencies in the legacy IT infrastructure (Pimchangthong & Boonjing, 2017). Lunardi et al. (2017) stated that assessment on existing risks and IT infrastructure should be an ongoing process and critical part of data governance to keep IT infrastructure up-to-date.

Participant EM1 stated, “Our IT infrastructure upgrades included streamlining and adding new functionality to the application systems. The new changes to the IT infrastructure reduced the operational costs and risks because it removed data silos.” Participant EM2 stated, “We consolidated application systems that eliminated redundant processes. The consolidated application systems increased data speed, capacity and security.” Similarly, participant PM2 stated, “Changes made to the application systems enhanced data security, increased data capacity, and data speed.” Participant PH1 stated, “We used current state documents to assess opportunities to automate manual processes to reduce operational risks and costs.” Participant EM2 stated, “We build a standard shop for all the reporting needs. We build standard reporting databases for reporting which saved resource time by implementing standards on corporate data warehouses and keeping data and processes consistent and error-free.” Participants’ statements resonated with Muhe and Drechsler’s (2017) assertion that removal of redundant processes from the

IT infrastructure can improve application system performance. According to Lunardi et al. (2017), removal of redundant processes from the IT infrastructure can reduce operational costs and risks related to IT infrastructure. In the next subsection, I discussed the third subtheme of strategies to manage IT risk.

Subtheme 2.3: Strategies to manage IT risk. The third subtheme that developed from the findings was strategies to manage IT risk. In this study, I found that training is an effective strategy to educate employees regarding new processes, policies, and procedures used in using and implementing data governance frameworks. Participant PH2 stated, "We worked with our corporate training team to develop mandatory role based trainings to comply with new IT risk management policies." Similarly, participant PM1 stated, "We developed mandatory self-paced trainings to ensure employees are aware of new regulatory requirements mandated by the government agencies." According to Chakravorty (2015), compliance with IT risk management policies and regulatory requirements mandated by government agencies is necessary to support risk mitigation processes. Similar to Chakravorty, Vincent, Higgs, and Pinsker (2017) stated that compliance with IT risk management policies could help mitigate operational risks. According to Smallwood (2014), a critical component of data governance framework is to manage IT risk. Implementation of IT management policies and procedures approach is widely used by data managers to govern IT risk (Smallwood, 2014). Similarly, Participant EM1 stated,

> We developed trainings to educate our teams. We worked with the corporate training department to develop trainings for new IT risk management policies and

> procedure to govern data. We made these trainings mandatory for all team members who were involved in the implementation and management of data governance process.

Similarly, participant PM2 stated, “We emphasized on the need for user trainings for awareness of changes to the process and new data management policies. Trainings were provided to impacted users for new tools and processes to achieve efficiency.” Participant PH2 stated, “We noticed a reduction in data inaccuracies after utilization of IT risk management policies.” Participant PM1 stated, “Our cost to clean up data reduced significantly after we implemented new data management policies.” Similarly, Merino et al. (2016) stated that promoting a culture of utilization of risk management policies can reduce data issues which can reduce operational cost significantly by the reduction in data cleanup efforts at a later stage. Participant EM2 stated,

> We provided necessary trainings, but the big challenge was how to encourage people to follow new policies and procedures to manage data risk. Therefore, I discussed this challenge with my peers and we all agreed that we must encourage our teams to follow new policies and procedure, so we put on our leadership hats

Participant EM2 further elaborated and stated, “I influenced and encouraged my team and showed my team benefits of policies and procedures to manage data risk.” Participant PM1 stated, “Constant encouragement was provided to the team members and a corporate culture of collaboration was developed to adopt new policies and procedures to manage IT risk.” Participant EM2 stated, “Our encouraging leadership approach not only was effective in the adoption of new policies and procedures, but it was also

effective in resolving issues related to the implementation of data governance frameworks." According to Gandolfi et al. (2017), servant leaders achieve success through teamwork and encouragement. Doh and Quigley (2014) and Gandolfi et al. stated that encouragement and teamwork quality of servant leaders are essential to enforcing change and to creating dynamic teams where collaboration among many teams is desirable. This concludes the third subtheme.

To summarize this theme, data from interviews revealed that policies and procedures played a critical role in the success of data governance framework implementation. The use of policies and procedures allowed various groups to understand and follow a consistent approach to implement data governance frameworks to manage IT and data risks. Trainings helped employees to understand new IT risk management policies and menthols to manage IT and data risks. Templates helped to capture, assess and analyze existing IT infrastructure, risks, and controls associated with data which enabled corporate data managers to design a new robust IT infrastructure to reduce operational costs and risks. According to Ayupov et al. (2018) and Deshpande (2016), standard tools and templates to assess and analyze risk associated with IT infrastructure are an effective approach to reduce risks and achieve consistency and efficiency. The theme of data governance strategies and procedures relates to, and confirm themes emerged in the literature review. The research findings in this theme relate to the servant leadership conceptual framework. Leaders can encourage an organizational culture to adopt change and influence the necessity to establish data governance strategies and

procedures to implement data governance frameworks to reduce operational risks and costs.

The participants provided the responses to Interview Questions 2 through 10, and from their responses I identified Theme 1 and its three subthemes. Table 3 shows a list of the study participants and how often participants mentioned each subtheme as an effective strategy to implement data governance frameworks to reduce operational costs and risks.

Table 3

Theme 2: Subthemes of Data Governance Strategies and Procedures

Participant	Subthemes		
	Change management process	Strategies to optimize IT infrastructure	Strategies to manage IT risk
	#	#	#
EM1		1	1
EM2		2	3
PH1	2	1	
PH2	1	1	2
PM1	1		3
PM2			
PM3		1	

Theme 3: Accuracy and Security of Data

The third theme that developed from the findings was the importance of accurate data, and the security of using and storing that data. Data play a critical role in business analysis, reporting, and decision-making process and the accuracy of data are crucial (Aristei & Gallo, 2017). According to Gass et al. (2017), the accuracy of data are critical because the accuracy of business functions depends on the accuracy of data. Large organizations can have many applications system that stores data and it is important that data are sourced from an official system of record (Diener et al., 2016). Data from the research findings showed a data testing function and data controls were established to achieve accuracy of data. Participants indicated that data management software such as Statistical Analysis System Data Management Platform (SASDMP) to analyze data for accuracy and SAP Data Hub were used to manage and process data. A suite of Symantec data security software was used to protect data and several custom-built software were used to manage data access.

Participants indicated that there are two types of reports: (a) risk report and (b) regulatory reports. Risk reports are internal reports that are used to manage risk and regulatory reports are sent to the external regulators. Inaccurate risk and regulatory reporting can increase operational cost through regeneration of reports and inaccurate risk and regulatory reporting which requires the accurate collection and analysis and reporting of specific firm operations, if not done properly can draw the attention of external regulatory agencies and possible fines. (Angeles, 2017; Chakravorty, 2015). This theme highlights the participants' perception that achieving accuracy of data are important

component of a solid data governance framework, along with ensuring the security of that data to protect it from misuse. Data frequently were protected by conducting data security awareness assessments and the use of data security software by three organizations. Participant PH1 stated, “We implemented a process to conduct a data security assessment and based on the outcome we developed new data security measures in our data governance frameworks. We used a suite of Symantec data security software to protect data.” Data from this study showed that data accuracy and validity was achieved by implementing testing and validation functions. Participant EM2 specifically stated,

> We learned from our past when we had to regenerate reports due to data issues. The need for accurate and valid data was critical. Therefore, testing of data was a must have function for us. We used SASDMP to analyze data accuracy and SAP Data Hub to manage and process data that is used in risk and regulatory reporting. We also used the IBM platform and built few custom solutions to store risk and regulatory reporting data in a unified platform to achieve accuracy and efficiency. Accuracy and validity of data are crucial in the business analysis, and risk and regulatory reporting specifically to address the Comprehensive Capital Analysis and Review (CCAR) reports.

Two subthemes emerged, data accuracy and validity through data testing and data security.

Subtheme 3.1: Data accuracy and validity through data testing. The first subtheme that developed from the findings was the importance of data accuracy and validity through data testing. In this study, I researched whether accurate and valid data

plays a critical role in the decision making process. Data accuracy and validity can be achieved thru ensuring data are sourced from credible systems of record and establishing data testing and validation function. Data testing and validation function can ensure data issues are captured and remediated.

Participant EM1 stated, “It is important to understand origination of data. That is why our data management policies specifically addressed data sourcing requirements. Our policies state that data must be sourced only from an official system of record.” According to Alhassan, Sammon, and Daly (2018) and Diener et al. (2016), data sourcing is a critical component in the reporting, and official system of record or system of origin should be selected for data accuracy and validity based on the reporting requirements. Participant EM1 echoed assertions of Alhassan et al. (2018) and Diener et al. that it is crucial to source data from an official system of record or system of origin for data accuracy and validity. Participant PH2 stated,

> We ensured data governance frameworks addressed component of data testing to ensure accuracy and validity of the data. Comprehension of data accuracy is critical because data are used in business decisions and risk and regulatory reports. The use of inaccurate data generates inaccurate risk and regulatory reports, which produces inaccurate results and can impose fines on the bank and negative impact on the reputation.

Similarly, Gass et al. (2017) stated that data are used to make business decisions and when inaccurate or incomplete data are used in business decisions; the outcome of decisions is not beneficial to the interest of a consumer and a company. Business

decisions are depended on business analysis of data, the accuracy of the business analysis depends on the accuracy and validity of data (Gass et al., 2017). Alhassan et al. (2018) stated that a unified data storage platform can be used to minimize data inaccuracies and to improve data security and efficiency. A unified data storage platform can offer few benefits, for example, less operational cost, fewer data controls can protect large sets of data from misuse, and data access can be managed in a single solution (Alhassan et al., 2018). According to Diener et al. (2016), unified data storage platform can provide ease in data retrieval process by minimizing data sourcing connections for data analysis and reporting.

Participant PH2 stated, “Inaccurate CCAR reports can have a negative impact on the bank’s capital requirements mandated by the Federal Reserve.” Similarly, Chakravorty (2015) found that inaccurate data generates inaccurate risk and regulatory reporting can have a negative impact on bank’s capital requirements. Participant PH1stated,

> We formed a testing and validation function to ensure data accuracy and validity. This was a change to the existing process. We received pushback from a few group leaders because it added additional steps in the process. We thought it would be a good idea to do value-added demos. We did demos to show how these functions can add value and promote awareness and it worked. We influenced leaders to get their buy-in. Our encouraging leadership approach played a critical role to implement cultural change to enforce and encourage data testing and validation functions.

Similarly, participant PM2 stated, “The formation of data testing processes helped catch data issues before using data in risk and regulatory reports which also reduced operational cost and risk.” Gass et al. (2017) also mentioned that a formal process to test data to verify the completeness and accuracy of data contributes to the validity of data and reduces data errors. Participant PH2 stated, “We used standard templates to document test scripts to test data transformation rules for consistency. Data transformation test scripts were reviewed with both business and technology groups for accuracy prior to the production implementation.” Similarly, Eler, Endo, and Durelli (2016) and Shigarov and Mikhailov (2017) stated that data transformation rules should be reviewed before implementing rules into production application systems to avoid data errors. Participant PM3 stated, “We implemented automated data testing controls to ensure data validity and accuracy.”

Participant PM2 stated, “We developed a master data dictionary per application system to conduct impact data analyses for application system changes. Today we use the master data dictionary during data testing script building exercises.” Participant PM1 stated, “Our master data dictionary contains business and technical metadata along with information of data usage.” Participants’ statements resonated with assertions of Trofimo et al. (2016) that a master data dictionary is useful to conduct impact analyses of data elements and data usage when changes need to made to an application system. In the next subsection, I discussed the second subtheme of data security.

Subtheme 3.2: Data security. The second subtheme that developed from the findings was data security. In this study, I found that data security is critical and strong

data security measures can protect data from misuse. A robust data access management, data security awareness assessment, and or software can be used to protect data. Data security is critical to the business specifically in the banking industry because data in the bank application systems contain confidential and protected data (Phan et al., 2016). Misuse and or breach of data can have a negative effect on the consumer and reputation of a company (Anderson, Baskerville, & Kaul, 2017). Strong data security is essential to protect data from misuse and data breaches (Anderson et al., 2017; Kim & Patel, 2016).

Participant PH2 stated, “We control data access through a strict managed process to ensure user access is based on the business needs to protect data from misuse.” Participant PM3 stated, “Our data access management process is automated, and we build rules to remove users who have not used their access for 45 days.” Participants’ statements resonated with assertions of Anderson et al. (2017) that data access is a crucial component that can protect against unauthorized access to data.

Participant PH2 stated, “We use data security software to secure data.” Similarly, participant PM1 stated, “We use a variety of data security software to protect data from misuse.” Silverman (2015) cited that security software is an effective tool to protect data from misuse. Participant EM1 stated, “We conduct annual data security awareness assessment and update data security measures to protect data from misuse and data breaches.” Participant EM2 stated, “We have custom data protection software to protect data from unauthorized use for those employees who work from home.” Participant PH2 stated, “We conduct data security analysis on a regular basis to assess if IT risk management policies and procedures need to be changed to enhance data security.”

Similarly, participant PM3 stated, “Our data security measures included annual attestation of IT risk management and data security policies to ensure data security policies are up to date. We influence our teams to adhere to data security policies because it helps us to save cost and risk.” Participants’ statements resonated with de la Torre-Diez, Garcia-Zapirain, and Lopez-Coronado (2017) and Silverman’s (2015) assertions that data security analyses are essential exercises that can enhance data security. This concludes the second subtheme.

To summarize this theme, data from interviews revealed that accurate data plays an important role in the business decision-making process. Data are used in risk and regulatory reporting that can enable leaders to make informed business decisions. Inaccurate data can lead to inaccurate business decisions. Therefore, data accuracy and validity of data are critical. Participants mentioned that accuracy and validity of data achieved through forming a data testing and validation function. Data security is achieved by implementing data access controls, data security awareness assessments, and data security software. A cultural change was needed to implement new formal data testing functions to improve data quality and custom to adhere to data security policies to understand the critical need of accurate data and to mitigate data risks. Organizational change was achieved through training, and management consistently working to increase employee awareness of the importance of data security, and finally, by persuading employees it was imperative to keep data secure. According to Adams et al. (2016) and Panaccio et al. (2015), awareness and persuasion are two key qualities of a servant leader. Gandolfi et al. (2017) stated that servant leaders can change organizational culture

through persuasion and achieve results when companies go through the organizational changes necessary to stay competitive in an increasingly hostile and difficult business environment. The theme of accuracy and security of data relates to, and confirms themes that emerged in the literature review. The research findings in this theme relate to the servant leadership conceptual framework. Leaders can change an organizational culture through persuasion to implement and adapt to data testing procedures to improve data quality and custom to adhere to data security policies to mitigate data risks.

The participants provided the responses to Interview Questions 2 through 10, and from their responses I identified Theme 1 and its two subthemes. Table 4 shows a list of the study participants and how often participants mentioned each subtheme as an effective strategy to implement data governance frameworks to reduce operational costs and risks.

Table 4

Theme 3: Subthemes of Accuracy and Security

Participant	Subthemes	
	Data accuracy and validity through data testing	Data security
	#	#
EM1	2	
EM2		1
PH1	1	
PH2	3	3
PM1	1	
PM2	2	
PM3	1	2

Theme 4: Establishment of a Data Office

The fourth theme I identified from the findings was that the establishment of a data office was critical to the overall development and implementation of an IT infrastructure that is capable of collecting, collating, and generating reports in real time for management and regulatory use. A data office is essential to the formation of data governance frameworks (Bennett, 2016), because it provides an organizational framework and strategic roadmap to implement and carry out data governance

frameworks activities (Peterson et al., 2016). Similarly, van den Broek and van Veenstra (2018) stated that a data governance office is a principal component of data governance frameworks, and a data office is critical to govern and carry out framework activities. This theme highlights the participants' perception that formation of formal data offices played a critical role in carrying out data governance frameworks' activities. Participant EM2 stated,

> We built out data governance frameworks to achieve efficiency and consistency to manage data and risk. To achieve this task we wanted to ensure we provided support to our teams both from a strategic and functional level and decided to have data offices at two levels of our organization.

Participants shared experiences that data office at a line of business (at the functional level) and a corporate level (strategic level) helped in achieving success through productive and precise cooperation between business and technology leaders. Two subthemes emerged, data office at a strategic level and data office at a functional level to implement data governance frameworks.

Subtheme 4.1: Data office at a strategic level. The first subtheme that developed from the findings was that the formation of a data office at a strategic level was critical for effective strategic decision-making process. A data office at a strategic level built strategic plans to implement data governance frameworks and provided support to functional data offices. This office built templates to capture, assess and analyze existing IT infrastructure, risks, and controls associated with data. This office also developed risk management policies to achieve consistency and to manage data and

IT risk. According to van den Broek and van Veenstra (2018), consistency and efficiency can be achieved through the implementation of templates because templates can save time and give users a prepopulated structure to capture information. Participant EM1 stated,

> We saw a strong need for a central body to manage and govern activities related to data governance frameworks implementation. The need came from the necessity to achieve consistency and efficiency. We worked side by side with each line of business data offices employees to develop and implement templates to capture, assess and analyze existing IT infrastructure, risks, and controls associated with data. We also developed policies and procedures to manage data and IT risk. Standard templates were provided to each line of business data office employees to minimize conflicts and redundant work.

Participant PM3 stated,

> We developed training sessions to learn and conduct impact analysis based on IT risk management policies and new regulations mandated by government agencies and internal risk committees. I had a dedicated team of subject matter experts who conducted training sessions with each line of business data office employees.

Participant EM1 stated, “The use of templates helped achieve consistency.” Participant PH2 stated, “The use of templates helped lowered the operational costs and risks because we achieved consistency in the process.” Participants’ statements resonated with van den Broek and van Veenstra’s (2018) assertion that standardization of tools and templates can lower the cost and risk through the comprehensible approach and minimum

misunderstandings. In the next subsection, I discussed the second subtheme of data office at a functional level.

Subtheme 4.2: Data office at a functional level. The second subtheme that developed from the findings was that the formation of data office at a functional level was critical for organizational success. In this study, I found that functional support was needed to carry out data governance frameworks activities at functional levels of the banks. Therefore, a need of data office at a functional level was necessary. Participant PH1 stated,

> We needed teams of subject matter experts who were close to the business functions and understood both technology and business functions. We needed these folks to perform IT analysis and support activities related to data governance frameworks implementation. I discussed this need with my senior staff and leaders. After some back and forth we finally agreed to form functional data offices to support activities related to data governance frameworks implementation.

Participant EM2 stated, “Our line of business data office employees worked with business and technology teams to carry out tasks to conduct impact analysis based on IT risk management policies and regulations.” Participant PH1 stated, “A line of business data office employees developed current state documents of IT infrastructure and developed new IT infrastructure designs.” Similarly, Ramachandran (2016) stated that establishing cooperation between business and technology groups is an effective approach to gather different perspectives to conduct optimal IT analysis. El Yamami,

Ahriz, Mansouri, Qbadou, and Illousamen's (2017) assertion resonated with Ramachandran's statement that cooperation between business and technology groups is essential to analyze and implement technology solutions. Participant PH2 stated, "We built testing functions of new changes to application systems and data at the line of business data office level to keep this function close to the business and to achieve consistency and reduce cost." Similarly, Gass et al. (2017) also mentioned that testing of new changes to application systems can catch issues at the early stage, which can reduce remediation cost.

Participant EM2 stated, "Our line of business data office tasks also included role establishment of data stewards, data supplier, and report stewards to provide clear directions and responsibilities." Participant PH1 stated, "Teams within each line of business data office conducted lessons learned sessions and enhanced the data governance frameworks." Participant PM1 stated, "The line of business data office employees played a critical role in the data issue identification and resolution process through diligence accountability and effective communication and brought issues to appropriate business and technology stakeholders." According to Weiss (2018), utilization of effective communication and being able to tailor the message is essential to get the right message in front of a right audience to achieve optimum results. Similarly, Adams et al. (2016) and Gandolfi et al. (2017) stated that servant leaders achieve success through teamwork, accountability, and effective communication. Participant EM1 stated, "Our teams did a great job building effective relationships between business and technology groups and it was a key success factor to establish data offices to implement

data governance frameworks." Similarly, Peterson et al. (2016) and Putro et al. (2016) stated that data governance frameworks is an ongoing process and effective relationship between diverse teams is an important success factor.

To summarize this theme, the corporate data office built strategic plans, policies, and templates and provided support to functional data offices to implement data governance frameworks. A line of business data office employees helped identify issues in data and worked with business and technology leaders to address issues. Each line of business data office leaders shared knowledge through lessons learned sessions and the knowledge shared helped enhance policies and procedures of the framework. Zhao, Detlor, and Connelly's (2016) assertion that knowledge sharing through the experience gained is an effective approach to mitigating issues in the future. A line of business data office employees played a key role in building relationships through effective communication between business and technology groups. According to Gandolfi et al. (2017), servant leaders have the attitude of serving others and achieve success through effective communication and teamwork. The theme of the establishment of data office relates to, and confirm themes that emerged in the literature review. The research findings in this theme relate to the servant leadership conceptual framework. Leaders can achieve success by utilizing effective communication and building relationships through teamwork to establish data offices to implement data governance frameworks.

The participants provided the responses to Interview Questions 2 through 10, and from their responses I identified Theme 1 and its two subthemes. Table 5 shows a list of the study participants and how often participants mentioned each subtheme as an

effective strategy to implement data governance frameworks to reduce operational costs and risks.

Table 5

Theme 4: Subthemes of Establishment of Data Office

Participant	Subthemes	
	Data office at a strategic level	Data office at a functional level
	#	#
EM1	2	1
EM2		2
PH1		3
PH2	1	1
PM1		1
PM2		
PM3	1	

Theme 5: Leadership Commitment at the Organizational Level

The fifth and last theme that developed from the findings was that leadership commitment at the organizational level was imperative for organizational success. This theme highlights the participants' perception that leadership commitment at the organizational level plays a critical role in the data governance frameworks design and implementation. In this study, I found that a major component of frameworks' success

was the support of leadership commitment at an organizational level from senior leaders. There were issues during the design and implementation phase of data governance frameworks and senior leaders guided corporate data managers to mitigate issues. Particularly participant PH2 stated, “We had resource constraint issues and we were fortunate to have leadership commitment and support. They were there when we need them, and we were provided additional resources to design and implement data governance frameworks.” Coetzer et al. (2017) stated that effective leadership is a key element to organizational success. Leaders play a crucial role in the formation of organization culture (Adams et al., 2016). According to Putro et al. (2016), data governance frameworks involve working with multiple lines of business, and by nature when many leaders engage in a decision-making process, conflicts tend to arise. An effective leader tries to understand the perspectives of others and come to an agreement to achieve success (Bashir & Azam, 2016). Gandolfi et al. (2017) found that without the commitment of senior leaders, the success can have severe challenges especially when stakes are high. Two subthemes emerged, resolve challenges through leadership and organizational change through leadership.

Subtheme 5.1: Resolve challenges through leadership. The first subtheme that developed from the findings was to resolve challenges through leadership. In this study, I found that effective leaders played a critical role in resolving organizational challenges. Effective leaders inspire their teams and provide support to achieve organizational goals. Participant PH1 stated, “During the current state documentation phase of the IT infrastructure, we faced challenges. There was less to no cooperation from business and

technology leaders. The challenges were due to limited time and resource availability." Participant PH2 stated,

> We had many challenges; there was a lack of tools, inconsistent processes, an inexperienced workforce, and people were comfortable with the old habits of using the manual processes. I brought these issues to the senior leaders. Senior leaders helped and provided funding for additional resources, trainings, and added tools so that the work can be carried out without interruption of daily activities.

Similarly, participant PM2 stated,

> We had a hard time getting agreements from both technology and business managers on the new automation solutions. Our senior leaders guided us to stay on course and focus on what is right for our company and customers. They guided us to work together to find a solution.

Participant PM3 stated,

> We had a dependency on IT teams to implement new IT infrastructure and IT teams were preoccupied with other projects. Once I brought this issue to the senior leadership, they worked with technology managers to reshuffle project priorities to allocated resources to my project.

Similarly, Newman, Schwarz, Cooper, and Sendjaya (2017) stated that effective leaders play an important role to resolve complex business problems through encouragement and leaders provide guidance to the team members to create innovative solutions to achieve organizational goals. Similarly, Hoch, Bommer, Dulebohn, and Wu

(2018) stated that servant leaders guide their teams through influence and effective communication to resolve business problems.

Subtheme 5.2: Organizational change through leadership. The second subtheme that developed from the findings was that successful organizational change was only possible through active leadership. In this study, I found that effective leaders played a critical role in implementing organizational change. Leaders provided encouragement and support to embrace organizational changes. Participant EM1 stated,

> Organizational changes can be difficult for many of us and it is my role to encourage my team to embrace change for good. When I meet with my team I ensure my team is fully aware of the implications of organizational changes.

Participant PH2 stated,

> Implementation of data governance frameworks was a big change in our organization. We implemented new processes and procedures to manage risk. We were successful because we provided organizational enforcement and mentorship to educated stakeholders about the importance of data governance frameworks.

Participant PM2 stated, “When some line of businesses did not follow policies and procedures; I worked with a line of business leader to enforce proper policies and procedures.” Participant PM1 stated, “We had announcements come from senior leaders at the organizational level to enforce new IT risk management trainings. These trainings enabled employees to understand and follow standard policies and procedures.” Participant PH1 stated, “Encouragement from top leadership helped achieve organizational goals to implement data governance frameworks.” According to Bashir

and Azam (2016), an organizational culture that welcomes change is an essential factor to foster success in a robust dynamic organization, and servant leaders can change organizational culture through influence. Similarly, Hoch et al. (2018) stated that servant leaders not only proven effective in influencing their followers but also help to change an organizational culture for innovation and adaptable to organizational change.

To summarize this theme, leadership commitment at the organizational level was critical to implement data governance frameworks. Effective leadership helped resolve challenges related to the design and implementation of data governance frameworks and provided support through encouragement. Leaders influenced their teams to find solutions to business problems and provided encouragement to embrace organizational changes. Similarly, Adams et al. (2016) and Hoch et al. (2018) stated that top leaders' empowering behavior is a success element that is required to implement change. According to Bashir and Azam (2016) and Hoch et al., encouraging leadership style can influence organizational culture to be adaptable to change. The theme of leadership commitment at an organizational level relates to, and confirms, themes that emerged in the literature review. The research findings in this theme relate to the servant leadership conceptual framework. Leaders play a critical role in the success of an organization. Leaders' commitment at the organizational level to influence organizational change to implement data governance frameworks is imperative.

The participants provided the responses to Interview Questions 2 through 10, and from their responses I identified Theme 1 and its two subthemes. Table 6 shows a list of the study participants and how often participants mentioned each subtheme as an

effective strategy to implement data governance frameworks to reduce operational costs and risks.

Table 6

Theme 5: Subthemes of Leadership Commitment at the Organizational Level

Participant	Subthemes	
	Resolve challenges through leadership	Organizational change through leadership
	#	#
EM1		1
EM2		
PH1	1	1
PH2	1	1
PM1		1
PM2	1	1
PM3	1	

Relevance to the Conceptual Framework

The conceptual framework of this study is servant leadership. Greenleaf (1977) developed the servant leadership theory. Servant leadership is a leader-centric approach. A servant leader is someone who chooses to serve others first, making a conscious decision to lead with a focus on caring for others (Greenleaf, 1977). Servant leadership is

ideal to implement organizational change (Newman et al., 2017). According to Hoch et al. (2018), servant leaders can help shape an organizational culture adaptive to change through collaboration and encouragement. Leaders who take serving others approach to help their teams through critical times have shown proven success in organizational changes (Hoch et al., 2018). The research findings of this study showed that effective leadership through collaboration and encouragement have proven successful in implementing data governance frameworks.

In my analysis of findings, I found five major themes; (a) leadership role in data governance frameworks to reduce risk and cost, (b) data governance strategies and procedures, (c) accuracy and security of data, (d) establishment of a data office, and (e) leadership commitment at the organizational level. In theme 1, participants indicated that effective leaders played a critical role to steer organizational culture to adopt change that was required to implement data governance frameworks. Moreover, through collaboration and encouragement leaders influenced the need and benefits of data governance frameworks to reduce operational costs and risks. Serving others is a key quality of servant leaders (Adams et al., 2016). In this study, I found leaders who possess servant leadership qualities of collaboration and encouragement were successful in promoting changes to implement data governance frameworks in their organizations. In theme 2, participants indicated that the need for policies, procedures, and effective strategies of data governance was critical and played a crucial role in the success of data governance frameworks. According to Gandolfi et al. (2017), servant leaders make strategic decisions by focusing on inspiring the team and modeling the culture to be

adaptable. Participants influenced their teams through teamwork and awareness to develop, implement, and utilize data governance frameworks' policies, procedures, and effective strategies. Participants not only focused on the success of the project but also influenced their teams to be adaptable to organizational change.

In theme 3, participants emphasized the need and importance of accuracy and security of data in data governance frameworks through awareness and persuasion. According to Adams et al. (2016) and Panaccio et al. (2015), awareness and persuasion are two key qualities of a servant leader. Participants established clear expectations for their teams and implemented processes to improve data quality and enhanced data security. According to Newman et al. (2017), servant leaders achieve success through setting expectations upfront to avoid misunderstandings and establishing achievable objectives.

In theme 4, participants emphasized building relationships between business and technology teams through partnership, effective communication, and being considerate. According to Adams et al. (2016), servant leaders possess team-building skills and build lasting relationships with diverse individuals. Servant leaders are considerate and understand needs of others; this unique, thoughtful perspective mindset enables servant leaders to achieve success in challenging situations where organizational change is needed to be innovative (Adams et al., 2016).

In theme 5, participants emphasized that a strong and effective leadership commitment at the organizational level was needed to implement data governance frameworks. Participants stated that they achieved success through influencing their

teams and providing necessary support to remediate issues related to the implementation of frameworks. Participants stated that they implemented open door approaches so that their teams do not hesitate to bring issues to their attention. Similarly, Gandolfi et al. (2017) stated that followers of servant leaders feel connected to their leaders because they know their servant leaders will provide support when they need them to guide them through challenging times and followers feel a sense of security. Based on the research findings, it is apparent that leaders who utilize servant leadership concepts are suited to influence organizational change to implement data governance frameworks to reduce operational costs and risks.

Findings Related to the Existing Literature on Effective Business Practice

Based on my study research, I discovered alignment with existing literature on the subject. Chia-Huei & Zhen, 2015 stated that organizational culture that welcomes change thrives through challenging organizational changes. According to Gandolfi et al. (2017), servant leaders help their teams to be versatile to dynamic organizational changes through coaching and mentorship. Braun, Hayes, DeMuth, and Taran (2017) found that effective leadership plays a critical role in influencing organizational change, leaders can provide support and guidance to their teams to adaptive and stay focused during organizational changes. According to Williams et al. (2016), data governance frameworks require changes to existing processes and IT infrastructure. Braun et al. (2017) found that leaders who motivate organizational culture through coaching and encouragement can successfully implement change and resolve issues in their organizations. In my research I found that participants achieved success through coaching and mentorship to influence

organizational change to implement data governance frameworks and to resolve issues related to the implementation in their organizations.

According to Newman et al. (2017), servant leaders build a corporate culture of collaboration through awareness and mentorship. Servant leaders are ethical leaders who have an attitude of serving others. In my research, I found that participants built effective working relationships with both technology and business leaders through collaboration, effective communication, and awareness. According to Deshpande (2016), policies and procedures are required to achieve consistency and to provide guidance. Sen and Borle (2015) found that risk management policies and procedures are required to mitigate risk because risk management policies and procedures can help employees follow strict guidelines. The participants in my study indicated they implemented risk management policies and procedures to guide their teams to mitigate operational risks. Risk management policies helped eliminate ambiguity in the risk management processes.

According to Aristei and Gallo (2017), inaccurate data can have a negative impact on business decisions. Gass et al. (2017) cited that data testing policies and procedures can mitigate data issues and enhance data quality and accuracy. Similarly, my study participants shared they implemented policies and procedures to remediate data issues. Data testing policies and procedures improved the quality and accuracy of data. According to van den Broek and van Veenstra (2018), the formation of formal data offices is a critical component of data governance frameworks. Bennett (2016) and Peterson et al. (2016) stated that a formal data office could help drive framework activity and provide day-to-day support to both technology and business teams. Data offices can

enforce risk management policies and procedures to mitigate risks and help drive efforts to enhance risk management (Bennett, 2016; Peterson et al., 2016). Similarly, my study participants noted they implemented two types of formal data offices, (a) corporate data office and (b) line of business data office. Corporate data office built risk management policies and procedure and provided training to carry out framework activities. A functional data office carried out day-to-day framework activities and worked closely with both technology and business teams.

According to Weiss (2018), leadership commitment is critical to implement new policies and procedures in an organization. Braun et al. (2017) found that leadership commitment is important because organizational changes can demotivate and disengage employees due to the ambiguity that comes with the change. Some employees may fear what would happen if they may not be able to adapt to the change, or changes may create difficulties in their daily job functions. Leaders who motivate employees through encouragement and collaboration have experienced success in implementing organizational changes by minimizing ambiguity related to the change (Braun et al., 2017). The t participants in my study revealed they motivated their teams through mentorship, encouragement, and collaboration to keep their focus on framework activities. Participants implemented open doors policies to provide support to their teams.

According to Lunardi et al. (2017), outdated IT infrastructure can increase both operational costs and risks, and a robust IT infrastructure can lower both operational costs and risks. Similarly, in the findings participants stated that poor IT infrastructure, policies, and business processes contributed to higher operational costs and risks; after

implementing a robust innovative IT infrastructure, new IT risk management policies and procedures, they notice a reduction in operational costs and risks. In addition, participants implemented robust IT infrastructure that not only achieved efficiency but also enhanced the security of customer data.

Application to Professional Practice

The results of the study are significant to professional business practice in many ways. In this study, I identified practical strategies that successful corporate data managers used to implement data governance frameworks. Chakravorty (2015) showed that 67% of G-SIBs member banks responded that a future redesign of IT infrastructure was required to implement robust data governance frameworks. Knowledge of these findings may contribute to the reduction of operational risks and costs by utilizing strategies to optimize IT infrastructure through consolidation of application systems, which may also enhance data security. A robust IT infrastructure can enhance data security (Angst, Block, D'Arcy, & Kelley, 2017), increase data processing capacity (Clarke, 2016), and reduce application system failures and data risks (Gupta et al., 2016). Accurate data play a critical role in business decisions, and data are considered an important asset in this digital age (Pigni, 2016). A robust IT infrastructure can minimize data risks, increase data analysis capabilities for business use, and achieve operational efficiency (Clarke, 2016).

Awareness of these results may be helpful to corporate data managers to establish IT process and procedures to understand "where" and "how" data are used in their organizations; it can also be useful in the implementation of a robust IT infrastructure to

add data controls to enhance the security of data. IT infrastructure process and procedures documentation can assist in designing a robust IT infrastructure and enforce strong data controls to enhance data validity and security (Arsenyan & Buyukozkan, 2016). The insight gained by corporate data managers will empower them to implement a robust IT infrastructure to aid in removal of data silos, establishing standard reporting databases for accurate reporting, saving resources by reduction in system failures, and implementing data processing standards on corporate data warehouses to keep data and processes consistent for reporting and data analysis needs.

Chakravorty (2015) noted that banks use many applications systems to conduct business operations and reliability of data and applications systems are essential for the success of daily operations. Corporate data managers, who review findings from this study, will be able to invoke concepts of automating manual processes and eliminate redundant business and IT activities to lower operational costs and operational risks. Schoenmaker (2017) indicated that capital requirements in the banking industry depend on the operational risks, high risk requires high capital requirements and low risk reduce the capital requirements. Therefore, the low operational risks may reduce the capital requirements mandated by the Federal Reserve and banks may have more opportunities to invest capital.

The insight gained from the study will be helpful to corporate data managers to learn how to utilize servant leadership approaches to promote and support organizational changes through effective communication and encouragement and implement data governance frameworks to strengthen IT infrastructure. Furthermore, based on the

findings, data managers may also consider the importance of implementing data testing policies and procedures to enhance data validity and quality of risk and regulatory reports. An improved IT infrastructure may allow banks to run the CCAR process efficiently. As a result of this study, I found that CCAR process depends on application system capabilities of a bank and robust IT infrastructure enhanced application system capabilities and reliability. Therefore, with this information, corporate bank managers can have a deeper understanding of strategies to implement data governance frameworks to strengthen IT infrastructure, which may in return increase sustainability of banks through improved risk management practices.

Implications for Social Change

Banks play a crucial role in the economy because banks are intermediaries between savers and borrowers (Hirsch et al., 2016). The proper functioning of banks is important for a stable economy because of the monetary transactions (Chakravorty, 2015). Bank application systems hold confidential and protected data (Phan et al., 2016) and recent data breaches targeted consumer credit cards and social security numbers (Tatham, 2018).

A study by IBM and Ponemon Institute (2017) showed that data breaches increased in the last four years, and companies are paying a significant portion of the cost (see Figure 1) to protect against data breaches. In 2014, the average cost per breached record was $201, and in 2017, the cost increased to $225 (IBM & Ponemon Institute, 2017). A report by the Bureau of Justice Statistics (2015) revealed that in 2014, approximately 17.6 million U.S. residents were victims of identity theft; 86% of cases

were a result of misuse of credit cards and bank accounts. About 14% of the victims reported a loss of $1000 or more (Bureau of Justice Statistics, 2015). In 2017, 1579 data breaches occurred exposing 179 million records, 14.2 million credit cards numbers were exposed, and approximately 158 million Social Security numbers were exposed (Tatham, 2018). Occurrences of data breaches have been rising in the United States of America, and there is a strong focus by companies to protect data from future data breaches. The results of the study may improve consumer data protection through robust IT infrastructure enhancements. A robust IT infrastructure, data security policies, and procedures can improve the capabilities of a company to protect customer data from data breaches (Angst et al., 2017). In my analysis, I found that corporate data managers had an attitude of serving others and implemented IT solutions that enhanced data security to protect customer data. Therefore, with this additional knowledge, corporate data managers will have increased awareness about IT solutions that are valuable for the banks and also good for customers of the banks.

Contribution to positive social change through effective data governance strategies may mitigate the risk of data breaches and contribute to an equally positive bank reputation. A robust IT infrastructure may improve the sustainability of banks through reduced application systems failures, protecting consumer private and confidential data, and accurate and reliable data may enable corporate bank managers to make informed decisions on community investment projects. A strong bank may positively affect society by gaining consumer confidence and by making capital investments in the local communities (Zulfikar, Lukviarman, & Suhardjanto, 2017).

Participants stated that new jobs added to support data governance functions. Therefore, job growth in this sector has the potential to contribute to a stronger economy job growth in data governance frameworks' field.

Recommendations for Action

Data governance frameworks are essential to technology-driven organizations because accurate and reliable data are essential for business activities (Putro et al., 2016). Banks are technology-driven organizations, and bank functions depend on accurate and complete data (Borena & Negash, 2016). Based on the results of the research, I submit the following recommendations for action for corporate data managers:

- Accentuate benefits of accuracy, completeness, and reliability of data and through collaboration and inspiration promote an organizational culture that admires the necessity of data governance frameworks to achieve data accuracy, completeness, and reliability for business success.
- Provide essential tools and trainings to their teams to promote corporate agendas of data governance frameworks.
- Establish an effective working relationship with business and technology partners through effective communication and inspirational leadership skills.
- Establish an effective change management process to support and track the progress of data governance initiatives.
- Utilize resources effectively across divisions to balance the workload.
- Conduct information share sessions across divisions to share expert knowledge of best practices to implement data governance frameworks.

- Develop and implement process and procedures to understand applicable regulatory requirements mandated by internal and or external governing body.
- Develop and implement templates, process, and procedures to examine existing IT infrastructure to understand IT risks, IT costs, data risk, data usage, and data controls and develop appropriate remediation plans to mitigate concerns.
- Develop and implement processes and procedures to test “hardware” and “software” changes to bank application systems.
- Develop and implement data testing policies and procedures to remediate data issues and to enhance data validity and quality.
- Conduct impact, cost, and risk analysis before developing new IT infrastructure design.
- Design IT infrastructure to streamline application systems through consolidation of application systems, elimination of redundant IT processes, and automate manual processes.
- Establish a periodic process to assess IT infrastructure effectiveness and based on the assessment corporate data managers should develop and implement IT infrastructure changes to reduce operational costs and risks.
- Conduct lessons learned sessions based on prior mishaps to mitigate potential IT and data risks.
- Engage with appropriate senior leaders to seek support and guidance when directions are not clear and or need top leadership enforcement.

An important element of the research process is to disseminate research findings through publication in academic journals (Saracho, 2013). I will seek to disseminate my study of data governance frameworks through academic journals and local banking professional conferences focused on data management practices. Corporate data managers looking to gain knowledge about data governance frameworks strategies can benefit from the study. Corporate data managers who are unaware of strategies to implement data governance frameworks in their organizations could use the study as guidance.

Recommendations for Future Research

In this study, I examined the strategies used by corporate data managers to implement data governance frameworks. A major limitation of this study was that I compiled interview data from only seven participants in three banks. I conducted a qualitative multiple case study and the results of the study were limited to practices of corporate data managers in three banks located in North Carolina and New York. I gathered expert knowledge from seven subject matter experts in three banks; I did not explore population from non-bank financial institutes. Future researchers could explore studies using a phenomenological approach to include a bigger population and expand geographic locations outside the United States to discover strategies to implement data governance frameworks in the international banking industry.

Future researchers could explore studies using a multiple study approach to include population from small regional banks to explore strategies to implement data governance frameworks. Further studies could examine if results of future studies

formulatedifferent themes, further studies could include other regulated financial institutions, such as brokerage firms, mortgage companies, insurance firms, or investment companies besides banks to explore strategies to implement data governance frameworks. Based on results of this qualitative multiple study, I found that optimized IT infrastructure reduced operational costs and risks in three banks. Future quantitative research could examine a relationship between IT infrastructure and operational costs and risks in non-bank technology-driven companies: such as manufacturing or retail companies.

Reflections

Throughout the doctoral research process, I strengthened my writing and data analytical skills. Prior to my first residency, I intended to use a mixed method study design. I discussed the nature of my study and the use of a mixed method study approach with my professors and after the recommendation of one of my professors during my first residency, I decided to employ a qualitative multiple case study design. The recommendation was based on the nature of my study. Upon reflection, the multiple case study design proved to be the appropriate design for this study as I was able to collect meaningful data. I had thought I was a good data analyst however, the knowledge and skills gained and perspectives derived during the doctoral journey enhanced my analytical and writing skills. I did not hold preconceived ideas about the study participants or findings at the beginning of the study. Through careful analysis, I was able to identify emerging themes.

I found that industry practice and challenges were similar between three banks. Corporate data managers from three banks emphasized that an organization with a culture that is willing to accept and adopt change does achieve success, and effective leadership plays a critical role in the success of data governance frameworks implementation. I was pleased to have the opportunity to learn from participants.

My doctoral study experience gave me the ability to understand both practical and scholarly knowledge of data management practices. I learned from interview participants, peers, academic journals, and academic leaders throughout the program. Knowledge gained through the doctoral study process will help me with my professional goals. I hope to share knowledge with other members of society to spread the knowledge. Corporate data managers from other banks could learn strategies to implement data governance frameworks to reduce operational costs and risks. I gained expert knowledge and the importance of data governance frameworks in a corporate setup and the benefits of these to the society. Strategies learned from this study are of immense value to me in advancing my career.

Conclusion

The purpose of this qualitative multiple case study was to explore strategies that corporate data managers in banks used to implement data governance frameworks to reduce operational costs and risks. Three cases selected for this study were three banks located in North Carolina and New York. I used open-ended questions and conducted semistructured interviews. I utilized thematic analysis method to conduct data analysis. Five major themes developed through data analysis. Themes were (a) leadership role in

data governance frameworks to reduce risk and cost, (b) data governance strategies and procedures, (c) accuracy and security of data, (d) establishment of a data office, and (e) leadership commitment at the organizational level.

In conclusion, corporate data managers need to promote data governance awareness at the organizational level to achieve efficiency. Effective leadership plays a crucial role in promoting and adoption of new IT and risk management policies and procedure through leadership support and encouragement. Development of standard process and procedures is essential to understand current IT infrastructure capabilities. Consistency in the documentation is vital to achieving effectiveness in the IT infrastructure design. Development of IT process and producers are essential to test data and enhance security, accuracy, validity, and completeness of data. Corporate data managers should ensure through tools and trainings that team members understand and adopt new IT risk management policies and regulatory requirements mandated by internal and or external regulatory agencies. Effective resource planning is also crucial to ensure workload distributed equally among team members.

All participants emphasized that data are critical to bank operations; without accurate and complete data, efficiency is difficult to achieve. Effective working relationship with business and technology partners is vital for success. Collaboration is a key component to working together as a team to achieve success. Finally, leaders' play a key role in influencing organizational changes, and servant leaders are proven to be effective in influencing organizational change to implement data governance frameworks.

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Appendix A: Protecting Human Research Participants Certificate

Certificate of Completion

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

Date of completion: 06/23/2016.

Certification Number: 2100204.

Appendix B: Interview Protocol and Questions

Interview Protocol

A. Self-introduction to the participant.

B. Go over consent form and interview process.

C. Ask participant if he or she has questions.

D. Ask permission to record audio of the interview.

E. Ask permission to begin the interview.

F. Start the recording.

G. Start with interview question 1 and follow the interview questions sequence until last interview question.

H. Ask follow up questions.

I. Verify interview responses with the participant.

J. Ask participant if he or she has questions.

K. End the recording.

L. Thank participant for their time and participation in the study.

End Protocol.

Interview Questions

1. How long have you been involved in the design or implementation of data governance frameworks?
2. What are the challenges with implementation of data governance frameworks?
3. What has been your experience overcoming the challenges with implementation of data governance frameworks?

4. What strategies do you use to gain knowledge about current IT infrastructure?
5. What strategies do you use to gain knowledge about data risk associated with data usage?
6. How would you describe the data governance framework in your organization?
7. How do you assess the effectiveness of strategies for implementation of the data governance framework in your organization?
8. What strategies do you use to reduce operational costs?
9. What strategies do you use to reduce operational risks?
10. What additional information can you add that would be valuable for identifying the strategies you have used to implement the data governance framework in your organization?

Appendix C: Invitation Email Letter

Dear Mr. /Miss. _____,

My name is Tarlochan Randhawa, and I am a doctoral candidate at Walden University working on completing my Doctor of Business Administration in Information Systems Management degree. I am conducting a study on strategies that corporate data managers use to implement data governance frameworks to reduce operational costs and risks. I am inviting corporate data managers who have more than five years of experience in the data management/governance field in the banking industry. I will need approximately 1 hour of your time for an in-person or Skype video interview. Only audio of the interview will be recorded.

I will select participants based on the inclusion criteria below:

- A number of years of experience in the field of data governance frameworks.
- Participants must work in a bank located in the United States of America.
- Fluent in English.
- Selected participants will have extensive knowledge in the data governance field, especially in establishing a new data governance framework, data architectures, leading data offices, data security, and data management services in the banking industry. I will select middle, high, and executive level corporate data managers from two to five banks. Middle-level managers will have five years or more experience, high-level managers will have eight years or more experience, and executive level

corporate data managers will have ten or more years of experience in the data governance field.

I have provided Data Governance Knowledge Check Questionnaire and consent form in this email. Data Governance Knowledge Check Questionnaire is a qualifier questionnaire, and it will help me determine if you qualify for the study. The consent form will provide you information about your privacy and risks and benefits of the study. If you agree to partake in the study, please provide answers to the Data Governance Knowledge Check Questionnaire and read and indicate your consent by signing your name in the signature section of the consent form and email Data Governance Knowledge Check Questionnaire and consent form back to me. If you agree to partake in the study, please grant me permission for future communication and provide a preferred method of contact. I will email interview questions before the interview if you do qualify to partake in the study based on your answers to the Data Governance Knowledge Check Questionnaire and signed consent form. If you do not qualify to partake in the study based on your answers to the Data Governance Knowledge Check Questionnaire and signed consent form, I will provide you the reason via the email.

If you do qualify to partake in the study, you can still change your mind at a later time. You may stop at any time, and you do not need to provide withdrawal reason to me. You do not need to inform me if you decide to withdraw from the study at any time. No action will ever be taken against you if you do decide to withdraw from the study at any time.

If you do agree to participate in the study, you will receive a summary of the findings in every day English via individual email, which may allow you to learn about some of the best practices utilized by banks in implementing data governance frameworks to reduce operational costs and risks. I will not share your personal and professional information with anyone. Interview transcripts and audio recording files will be saved in a locked cabinet, and password protected USB drive for five years. I will destroy paper copies and USB drive after five years.

If you are interested in partaking in the study, please provide few convenient dates and time slots that will work best per your schedule for an in-person or Skype video interview.

Please feel free to contact me by replying to this email or cell phone (***) ***-**** or via e-mail ******.*****@WaldenU.edu if you have any questions related to the Invitation Email Letter, Consent form, Data Governance Knowledge Check Questionnaire and or related to the study within seven weekdays by MM-DD-YYYY before signing the consent form. If you have any questions related to the study at any time after you do decide to partake in the study you may reach out to me via the contact information provided above.

Regards,

Tarlochan Randhawa

Appendix D: Data Governance Knowledge Check Questionnaire

1. Are you fluent in English?
2. How long have you worked in the banking sectors in the United States of America?
3. How long have you been involved in the design or implementation of data governance frameworks?
4. What is your leadership style?
5. How many years of experience do you have in any or all of the fields listed below in the banking industry?
    a. Data architectures:
    b. Leading data offices:
    c. Data security:
    d. Data management: