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A Multicase Study of Critical Success Factors of Self-Service Business Intelligence Initiatives

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Abstract

A Multicase Study of Critical Success Factors of

Self-Service Business Intelligence Initiatives

by

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Dissertation Submitted in Partial Fulfillment

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Abstract

Information technology (IT) managers have sparse information on the critical success factors (CSFs) needed for self-service business intelligence (SSBI) initiatives among casual users. The purpose of this qualitative, multicase study was to describe Business Intelligence (BI) experts' views on the CSFs needed for self-service BI initiatives among casual users in the post-implementation stage. To meet this purpose, a multicase study design was used to collect data from a purposeful sample of 10 BI experts. Semistructured interviews, archival data, and reflective field notes drove the credibility of the multicase study's findings through data triangulation. Two conceptual models framed this study: Lennerholt et al.'s concept of SSBI implementation challenges of self-reliant users and Yeoh and Koronios's framework of business intelligence success. Fifteen themes emerged from the data analysis (textual data and cross-case synthesis), with five coding categories grounded in the conceptual framework: (a) effective BI-skills for the casual user, (b) SSBI education/training skills for casual users, (c) IT managers' challenges for empowering casual users in SSBI, (d) nature of a successful SSBI-initiative, and (e) CSFs for BI systems implementation. IT managers can empower casual users by applying CSFs to develop SSBI tools to support successful competitive performance. In the immediate and uncertain, post-COVID-19 business environment, driven by competing with analytics, this study may contribute to positive social change by supporting IT managers in developing effective SSBI training protocols, as one point of stability, to empower casual users and improve an organization's competitive advantage.

A Multicase Study of Critical Success Factors of Self-Service Business Intelligence Initiatives

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Dedication

This dissertation is dedicated to the memory of my father, Tony Pensick, my mother, and my husband.

In life, my father was inspired by his faith without limit or boundary; may heaven be his final resting place. He gave so much and asked for so little. I begin my PhD journey with him, but he passed before I completed the goal. He helped to guide me through my life and in my academic career development. He continues to be my source of strength and admiration.

My mother is the foundation that motivates me to achieve goals and overcome challenges. She was raised with six siblings in a small town of Nebraska. I remember her working hard and hoping that I could achieve more with my career and education.

Finally, I want to thank my husband, Chad, for his support and patience; may he always be my inspiration and my rock as we continue our life together.

Acknowledgments

As I reflect on this journey toward a PhD degree in the College of Management, I am amazed by the degree of support I have received to make this journey possible.

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I would especially like to thank Dr. Daphne Halkias, my chair. She has allowed me to learn and grow more comfortable in pursuing my dissertation. I had several communications with her, and it took her only a few minutes to a few hours to reply to my emails. With her guidance, my personal growth through this process will continue as I pursue other endeavors after graduation.

I am profoundly grateful to my dad and mom for their tremendous contribution to my upbringing and making me the person I am today. I am also grateful to all of those with whom I have had the pleasure to work during this program and other related projects. I would especially like to thank Dr. Marilyn Peterson: my mentor and friend. She has taught me more than I could ever give her credit for in this message. Also, my family for their patience and support. I could not have finished this degree without them.

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Chapter 1: Introduction to the Study

Self-service business intelligence (SSBI) is an emerging trend, allowing non-technical, casual user employees to efficiently and effectively use business intelligence (BI) in a self-reliant manner without needing the support of their IT managers (Aminy et al., 2019; Lennerholt & van Laere, 2019). Both academic and practitioner-oriented literature documents that many IT managers struggle to use the potential of SSBI and note significant challenges with casual user-related SSBI implementation (Baier et al., 2020; Lennerholt et al., 2020). IT managers who have implemented SSBI among their casual users report a high level of dissatisfaction with the result and no training themselves on guiding casual users to expand their analytics capabilities, and understanding of SSBI, so that they can successfully complete their assigned IS-related tasks on their own (Berndtsson et al., 2019).

Even when casual users of BI give overall positive ratings to SSBI, many do not know how to use it properly after implementation (Passlick et al., 2020). IT managers lack knowledge of the critical success factors (CSFs) required for successful SSBI implementation (Villamarín-García, 2020; Weiler, Marheinecke et al., 2019; Yeoh & Popovič, 2016). The extant literature on SSBI studies regarding casual users is mostly practitioner-oriented. Scholars recommended that a more in-depth understanding is needed, one that can describe BI experts' guidance for IT managers on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). In the immediate, uncertain, post-COVID-19 business environment, driven by the ever-increasing need of competing with analytics, bottleneck

issues with casual user employees' SSBI in the post-implementation stage can leave organizations with vulnerabilities in terms of reaching the competitive advantage needed for long-term sustainability (Bansai & Kumar, 2020; Hartmann & Lussier, 2020; Jacquin et al., 2020).

Chapter 1 includes the following sections: an introduction to the study topic and background of the study, problem statement, purpose of the study, research question, conceptual framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, significance, and summary.

Background of the Study

SSBI is an advanced technology to shift analytic analysis to the casual user and gain a competitive advantage (Abas et al., 2020; Bansai & Kumar, 2020; Mishra & Saini, 2018). Lennerholt and van Laere (2019) reported that SSBI is a new research area, and proposed studies to develop theories for guiding the SSBI user in order to increase adoption. Previous researchers have investigated the challenges associated with the use and impact of SSBI, and suggested that CSFs are an essential prerequisite for BI implementation success, and emphasized the importance of managerial implications within the BI process (Abas et al., 2020; Yeoh & Popovič, 2016).

In organizations, managers struggle with understanding how to access relevant data, train users to work with analytics, gain buy-in from people to change behavior, and align strategies with operational, technology, and human resources for SSBI use (Berndtsson et al., 2020; Yeoh & Popovič, 2016). Many casual users create ad hoc reports and integrate data into existing reports to complete tasks, yet they are unaware of

self-service BI; it is a computing environment that empowers the casual users with the ability to connect and analyze data for decision making without the need for IT support.(Baier et al., 2020). The awareness of the challenges can help practitioners improve the success of SSBI, guide researchers to simplify the SSBI implementation process, and educate users about SSBI's benefits and functionality (Berndtsson et al., 2019; Lennerholt & van Laere, 2019). Lennerholt et al. (2020) presented how users have difficulties using SSBI with daily tasks, and suggested that further investigation into managing the challenges to increase SSBI adoption.

Technology, inter and extra organizational environments, and global economic markets are consistently changing; IT managers need a better understanding of CSFs to increase knowledge about user related SSBI challenges regarding data access, data use, competencies, and use of the SSBI tool. In changing environments, the need to prepare and adapt to user-related SSBI difficulties is an opportunity to extend how to manage the challenges for increasing SSBI adoption (Lennerholt et al., 2020). Technology adoption occurs in an organization's data-driven culture with the advancement of the user capabilities to make informed decisions (Aminy et al., 2019). In a data-driven culture, organizations are the foundation that enables employees to work independently by transforming the role of the casual user to the role of the data consumer. The SSBI use is designed to empower the casual users that decentralize data analytics for decision making (Jacquin et al., 2020).

SSBI is not a one-size-fits-all for casual users to use the tool effectively, and IT managers need to understand the workflow of the casual users and develop appropriate

training programs (Aminy et al., 2019; Lennerholt et al., 2020). Various factors can influence SSBI use: unanticipated events, user resistance, organizational issues, user-related challenges, data access, data quality challenges, and technology (see, e.g., Duan et al., 2019; Hartmann & Lussier, 2020; Lennerholt & van Laere, 2019). With averse conditions reducing SSBI use, scholars recommended that user competency be supported by an organization's overall SSBI vision and strategy and by customized training for technical and nontechnical or casual user staff. Unanticipated events, such as the COVID-19 crisis, or potential barriers are learning opportunities for building the casual users' competencies, becoming situations for building stronger relationships between human, task, technology, and structure for strategic planning (Berndtsson et al., 2019; Hartmann & Lussier, 2020).

SSBI implementation's success may lie in increasing knowledge about CSFs for IT managers (Villamarín-García, 2020; Yeoh & Popovič, 2016). Since data-driven cultures occur at all organizational levels, IT managers may benefit from recognizing the role the CSFs play in building BI teams of casual users who do not struggle with data accuracy and data-driven decision making (Aminy et al., 2019). For successful SSBI at the post-implementation stage, scholars recommended that more research is needed to train IT managers about the nontechnical and technical elements of CSFs for BI implementation among casual user staff. With a different perspective, Villamarín-García (2020) proposed that BI success is associated with organizational collaboration to reduce uncertainty and improve business processes and suggested that the expert's use of the meanings of CSFs is an approach to understand BI success from both an organizational

and an economic perspective. Updated empirical research is needed, based on BI experts' guidance on which CSFs may enable casual users to fulfill their SSBI needs in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020).

Problem Statement

SSBI was developed to relieve excessive workload placed on IT departments for information management by deploying decision support systems and other information systems (IS) technologies to an organization's non-IT professionals or casual users staff (Aminy et al., 2019; Lennerholt & van Laere, 2019). Despite its advantages, SSBI's effectiveness in organizations remains low; in a recent global survey of 2,680 SSBI users, 70% identified themselves as casual users with a limited skill set to meet their expected work requirements (Baier et al., , 2020). SSBI advocates claim that the future of BI belongs to casual users, yet, its low diffusion rate shows that managing its post-implementation process among casual user staff remains problematic (Lennerholt et al., 2020). Managers who have implemented SSBI among their casual users report a high level of dissatisfaction with the result, and they remain concerned that users practice their jobs without the proper training or experience to implement SSBI with ease (Baier et al., 2020). The social problem is that many managers remain unsuccessful in developing their casual user staff into self-reliant BI users who can fulfill SSBI needs without the assistance of IT managers (Abas et al., 2020; Weiler, Matt et al., 2019).

A significant challenge among IT managers remains how to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality so they can complete their assigned IS-related tasks successfully (Berndtsson et

al., 2019). Even when casual users of BI give overall positive ratings to SSBI, many do not know how to use it properly after implementation (Passlick et al., 2020; Weiler, Matt et al., 2019). IT managers lack knowledge of the CSFs required for successful SSBI implementation (Villamarín-García, 2020; Weiler, Marheinecke et al., 2019; Yeoh & Popovič, 2016). The extant literature on SSBI studies regarding casual users is mostly practitioner-oriented; because of this approach, there is a gap describing BI experts' guidance on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). The specific management problem is that IT managers have sparse information on the CSFs for SSBI initiatives among casual users in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020).

Purpose of the Study

The purpose of this qualitative, multicase study was to describe BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage**.** CSFs are not equivalent to a standard set of measures (e.g., key indicators); CSFs are about a perspective from managers' current operating view (Aminy et al., 2019) and is widely adopted as a concept in information management systems studies (e.g., Bele, 2019; Yeoh & Koronios, 2010; Yeoh, & Popovič, 2016). The open nature of expert interviews may yield data from experts' breadth of knowledge and experience in research fields that still need exploring (Littig & Pöchhacker, 2014). To meet the purpose of this subject-matter-expert's study and to remain consistent with the qualitative paradigm, a multicase study design (Yin, 2017) was used to collect data from a purposeful sample of

BI experts. Semistructured interviews (Yin, 2017), archival data, and journaling/reflective field notes (Merriam & Tisdell, 2015) drove the credibility of the multicase study's findings through data triangulation (Guion et al., 2011; Halkias & Neubert, 2020).

Research Question

How do BI experts describe their views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage?

Conceptual Framework

This study was framed by two key conceptual models that focused on aligning with the purpose of the study:(a) Lennerholt et al.'s (2018) concept of the *SSBI implementation challenges of self-reliant users* that supports casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060), and (b) Yeoh and Koronios's (2010) *The Framework of BI Success*, which introduced "an extensive framework identifying the CSFs influencing BI systems success" (p. 25).

SSBI Implementation Challenges of Self-Reliant Users

Lennerholt et al.'s (2018) concept of SSBI implementation challenges were based on Imhoff and White's (2011) definition of SSBI as a process that "facilities within the BI environment that enable BI users to become more self-reliant and less dependent on the IT organization" (p. 4); it was published in the well-known practitioner's report, *Self-service BI: Empowering users to generate insight.* SSBI is aimed to support a BI system

that enables casual users to make decisions and to be more self-reliant and less dependent on the professional user. Through a systematic literature review, Lennerholt et al. (2018) identified four challenges related to developing casual users into self-reliant users: (a) easy to use BI tools, (b) easy to enhance and use BI results, (c) alignment between the casual user and BI tools, and (d) training for casual users to select, analyze, and understand data to make decisions. Awareness of these challenges can help practitioners avoid common pitfalls when implementing SSBI and guide scholarly researchers in focusing on their future SSBI research in important theoretical directions (Lennerholt et al., 2018).

The Framework of BI Success

Yeoh and Koronios (2010) examined the CSFs and the contextual issues required for BI implementations and developed *The Framework of BI Success* by extending the *IS Success Model* (DeLone & McLean, 1992). Yeoh and Koronios (2010) used a grounded theory approach in their seminal study to build a new theory to create their theoretical framework on how CSFs impact the implementation of BI systems. From a managers' perspective of organizational operations, the CSFs concept is the essential organizational factor in certain areas that leads to successful competitive performance, and poor results lead to reduced efficiency (Rockart, 1979).

A detailed discussion of the fit and rationale of the conceptual framework in relation to the study approach and research question will be discussed in Chapter 2.

Nature of the Study

This study's nature was qualitative, a research method that aligned its purpose and provided data to answer the research question. The quantitative method was not appropriate because the study's purpose was not to test a hypothesis, quantify a problem, or confirm a theory (Harkiolakis, 2017). The exploration of the experts' views was not suitable for mixed-method design due to the differences in ontological and epistemological perspectives (Heyvaert et al., 2013).

An exploratory multicase study (Yin, 2017) was used to meet the study's purpose: to better understand BI experts' views on the CSFs needed for SSBI initiatives among casual users at the post-implementation stage. Qualitative research seeks to explore experiences from the viewpoint of people living within a specific context; it is a method associated with the constructivist paradigm (Cooper & White, 2012). With this method, constructivism and postpositivism are used to understand complex issues, allowing for social interaction between participants and researchers to create new data (Harrison et al., 2017).

Among the main qualitative research designs—namely ethnography, grounded theory, case study, phenomenology, and narrative research—the multicase study design allowed the exploration of BI experts' views in real-life contexts (Harrison et al., 2017). With the empirical nature of the case study design, multicase study design is differentiated from a narrative research design since narrative research is specifically aimed at describing events and meanings without empirical evidence (McAlpine, 2016). Proper designs are required for the increasingly complex issues in the area of

management; the qualitative, case study, and multicase study designs are methods to go beyond the phenomenological features to describe the lived experiences of an individual to provide a contextual frame to the problem of the study (Runfola et al., 2017). In Harrison et al.'s (2017) article, an outline is presented of the alignment between the qualitative case study design and the social constructionist and interpretivist approaches. With qualitative case study designs, the multicase study allows for a deeper understanding of a research problem than a single case study design, thereby yielding higher replicability of the results and creating new theory (Ridder, 2017).

The multicase study is an empirical method to examine the patterns and relationships of a social phenomenon that involves each individual within the social context as a separate unit of study (Eisenhardt & Graebner, 2007; Yin, 2017). For this study, the unit of analysis was the BI expert. A purposeful criterion and network sampling strategy were used to identify and recruit participants for this multicase study (Baxter & Jack, 2008). The participants were screened with the following inclusion criteria: academics who (a) had authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search using the terms *self-service BI, BI, CSFs, BI implementation, self-service business analytics, business analytics, self-service technology,* and *BI solutions,* (b) had terminal degrees from accredited institutions; (c) had conducted extensive studies on management, BI, and BI CSFs for users; and (d) had in-depth knowledge about their experiences with the topic of the study (see Merriam & Tisdell, 2015).

I conducted 10 in-depth individual interviews with participants, with the number of participants as my sample size based on the data collection reaching data saturation. The three sources of data collected and used throughout this study were as follows: (a) interviews conducted using a semistructured interview protocol (Appendix A) with items that were designed and standardized by previous researchers, (b) archival data in the form of practitioner-based BI reports (Yin, 2017) and (c) journaling/reflective field notes (Merriam & Tisdell, 2015). With small sample sizes, qualitative research is an approach to obtain a deeper understanding of the phenomenon and participants' experiences through in-depth interviews; this alignment between the research method and philosophical paradigm contributed to data saturation and the transferability of results (Boddy, 2016)

In multicase study research, Yin (2017) recommended the cross-case synthesis method as the most appropriate data analysis technique for exploring patterns and data differences between cases. Cross-case synthesis is more proficient than content analysis for extending theory; in multicase studies, researchers must retain the case integrity when comparing cases rather than analyzing individual cases embedded within a single case study (Stake, 2006; Yin, 2017). In this case study, methods were used to ensure the trustworthiness of qualitative research and the transferability of findings (Merriam & Tisdell, 2015); and the strategies for improving trustworthiness and transferability included prolonged engagement, observation, member checking, audit trail, reflexivity (Merriam & Tisdell, 2015), triangulation, and rich, thick descriptions (Guion et al., 2011; Halkias & Neubert, 2020).

Definitions

Business intelligence: This term refers to business analytics and IT that processes and manipulates data for final analysis and decision support systems that support users for complex decision making (Mortenson et al., 2015).

Critical success factors: This term refers to areas of activities for important information requirements and support for the achievement of goals for all organizations that focus on the IT manager's abilities and skills in four primary sources: organizational structure; competitive strategy, industry position, and geographic location; environmental factors; and temporal factors (Rockart, 1979).

Casual user: This term refers to the inexperienced or nontechnical users with data needs for decision making and complete tasks with limited knowledge of the complex data relationships and access to data resources (Alpar & Schulz, 2016).

Data-driven organization: This term refers to data sharing organization with a large number of individuals focused on providing data access, accurate data, and education to leverage data in decision making for a competitive advantage (Anderson, 2015, p. x).

Self-service business intelligence: This term refers to a computing environment and tools used to connect and analyze data, operated primarily by casual users in business departments of organizations – rather than IT professionals or dedicated data analysts (Alpar & Schulz, 2016).

Assumptions

The current study was comprised of four assumptions. The first assumption was a concern with a potential situation to yield rich data by conducting individual interviews because of the participant's bias, time-intensive activity, level of interviewing skills, and lack of random sampling methods using a qualitative method. In the scientific community, quantitative and qualitative researchers disagree about the validity and reliability of collected qualitative data (Runfola et al., 2017). Quantitative research studies dominate the management field (Runfola et al., 2017). In qualitative research, the goal involves exploring how individuals understand a phenomenon and the meanings that individuals attribute to these events (Gaus, 2017). The derived meaning of events is an outcome of people's social interactions and their interpretations (Daher et al., 2017). The management field is in constant change, and more attention is needed to understand individuals' lived experiences and their interpretations of the world (Gaus, 2017).

The second assumption was the engagement of the expert participants to openly discuss detailed experiences and knowledge, which yields rich data through descriptive information during the interview process. This effort to gather information depended on the inclusion criteria that lead to the data analysis and results for the trustworthiness of the study. An essential aspect of the data collection and data analysis's trustworthiness was the interview process (Merriam & Tisdell, 2015). An interview protocol was used along with an audit trail log, journaling/reflexivity, field notes, and member checking during the interview process to ensure a trustworthy study. The field notes and member

checking were translated into data triangulation, contributing to data saturation and trustworthiness (Fusch et al., 2018).

The third assumption was as follows: regarding expert and elite interviews to distinguish between data collected with a thematical approach or informational understanding. Bogner et al. (2018) expressed the importance of identifying either informative objectives or interpretive objectives because of the differences in power between the interviewer, the researcher, and the interviewees, the participants. Knowledge gathered during data collection differentiate the power differences from the interpretive ideas of experts when the researcher develops an analytical construction of the subjective creation of meanings of the experts rather than the informative information when the technical knowledge of experts is presumed to be the priority compared to the researcher (Bogner et al., 2018). Interpretive research is based on the assumption that reality can not be separated between the subject and the object, the truth is formed through multiple perspectives of reality about a topic of interest, and the researcher is the main instrument for data collection and data analysis (Merriam & Tisdell, 2015). The experts provided various viewpoints of different perceptions related to the research topic that allows for building inductive theory from specific observations to broad generalizations instead of informative objectives to advise the readers and to increase awareness of an issue or an event with a list of facts using deductive theory to test a hypothesis from a general supposition (Bogner et al., 2018). For this study, the objective of the interviews was interpretive so that the BI experts' subject matter could be explored

and create new knowledge around the CSFs that contribute to SSBI initiatives' success among casual users in the post-implementation stage.

The fourth assumption involved my subjective bias for suppositions in the research than using the participants' information to confirm my belief and the procedures to address this bias throughout the dissertation process. Because of my previous technical experience, I established an objective approach for the research process and the data collection and analysis, remaining as unbiased as possible during the entire length of the study. I used triangulation strategies for higher levels of trustworthiness with the data collections and analysis, and an awareness of different data analysis methods to explain discrepancies in these methods (Fusch et al., 2018). I managed this bias with the strategies for building theory from multiple case studies while maintaining objectivity and collect data in a formal analytical model, as recommendation by Eisenhardt and Graebner (2007) with several approaches to my data methods and data analysis including (a) more rigor for theory building rather than theory-testing research by tightly framing the research question with the context of the existing theory, (b) choosing theoretical sampling suitable for informing and extending relationships and logic among well-defined constructs of the conceptual framework, incorporating interviews using several and highly knowledgeable participants who view the central phenomena from diverse perspectives, (c) presenting key rich-detailed results to demonstrate the connection between empirical evidence and emergent theory by summarizing evidence in tables, (d) writing about the pattern matching between data, theory and logical reasoning connection

between the constructs with a proposition, and (e) relationships among cases to assure readers of the robustness and generalizability of the study.

Scope and Delimitations

In the literature, the scope of SSBI research has expanded to exogenous global events, impacting organizations and individuals at a macro level and impacting their business processes and technology (Hartmann & Lussier, 2020). As conditions change, IT managers explore and adopt new BI tools to collect, organize, and analyze data to gain a competitive advantage. They are decentralizing data sources and empowering casual user staff to increase their use of data and analytic capabilities (Alpar & Schulz, 2016; Jacquin et al., 2020). For this study, SSBI management's scope was intra-organizational and inter-organizational collaboration, which considers the CSFs, such as social, organizational, technological, and informational factors (see Villamarín-García, 2020). IT management's macro perspective extends its scope beyond the micro (individual level) and meso (organizational level) and focuses on a dependent role that supports the organizational competitive advantage. The study boundaries are represented by the scope and delimitation (Tracy, 2019). Within the scope, the study is about the business sector, and IT managers with sparse information on the CSFs enable casual users to fulfill their SSBI needs in the post-implementation stage.

There is a gap in the literature to update the empirical research based on BI experts' guidance on which CSFs may enable casual users to fulfill their SSBI needs in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020). With advancing technology and changing environments, understanding the CSFs enable BI

stakeholders to maximize their limited resources and efforts by concentrating on significant factors and business–IT alignment to sustain competitive advantage. This study may inform the BI field on how other factors—such as organization structure, people and their skills, and work routines—enable successful BI implementation within organizations and manage challenges for increasing adoption (Lennerholt et al., 2020; Yeoh & Popovič, 2016).

For this study, the delimitations follow the study sample's inclusion and exclusion criteria to establish a replication process of a case study (Yin, 2017). The initialization of the replication process occurred when the unit of analysis, BI expert, was selected. In this study, a BI expert was defined as a scholar-practitioner who had expertise in BI management through study and critical assessment of a particular discipline or topic over an extended period of time and extensive involvement in the topic. The subject matter of BI management in this study was defined by a computing environment and new tools that meet the users' needs to analyze data quickly and independently through an interface (Alpar & Schulz, 2016).

For this multicase study, participants were recruited using purposeful criterion and network sampling strategies (Baxter & Jack, 2008) and then screened with the following inclusion criteria: academics who (a) had authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search using the terms self-service BI, BI, CSFs, BI implementation, self-service business analytics, business analytics, self-service technology, and BI solutions, (b) had terminal degrees from accredited institutions; (c)

had conducted extensive studies on management, BI, and BI CSFs for users; and (d) had in-depth knowledge about their experiences with the topic of the study (Merriam & Tisdell, 2015). BI experts were chosen to align with Villamarín-García's (2020) dimension of professional leadership, which describes an individual with leadership skills, analytic capabilities, BI project engagement, and academic and professional education.

Limitations

In the research study, the limitations are the methodological constraints and influences over which the researcher has no control; hence, they could impact the overall trustworthiness of study results (Merriam & Tisdell, 2015).

The first of three limitations was choosing the most suitable techniques to answer the research question. For this study, an in-depth literature review was conducted to support the stated research question and investigate a contemporary research problem into a real-life context (Yin, 2017). In addition to the literature review, other techniques effectively aligned the research components with answering the research question, for example, prolonged engagement, observation, triangulation, member checking, audit trail, reflexivity, and rich, thick descriptions.

The second limitation was the scholarly disagreement about qualitative research and the generalizability of results. Although multicase studies are more robust than single case studies, the goal of qualitative research resides in analytic generalizations rather than statistical generalizations (Yin, 2017). The validity of qualitative case study research is dependent on the research purpose and the effective use of different sources of evidence,

such as documentation, archival records, interviews, direct observations, participant-observations, and physical artifacts (Yin, 2017). In the context of trustworthiness, the challenge remains in the transfer of similar behavior results of cases from one context to another while accounting for the robustness of multicase studies (Bass et al., 2018). Semistructured interviews (Yin, 2017), archival data, and journaling/reflective field notes (Merriam & Tisdell, 2015) were used to support the credibility of the study's findings through data triangulation (Guion et al., 2011; Yin, 2017).

The third limitation was posing interview questions and the honesty and transparency of the participants' responses. The interview process could distort participants' responses due to the context surrounding the participants, whether political or sociological, including personal bias or anxiety (Merriam & Tisdell, 2015). As the researcher, my? role was crucial in building trust with each participant, managing emotions, and assuming ethical responsibilities (Rubin & Rubin, 2012).

Significance of the Study

Both scholarly and practitioner-oriented literature document that many IT managers struggle to use the potential of SSBI and note significant challenges with casual user-related SSBI implementation (Baier et al., 2020; Lennerholt et al., 2020). IT managers who have implemented SSBI among their casual users report a high level of dissatisfaction with the result and [add verb here?] no training themselves on guiding casual users to expand their analytics capabilities and their understanding of SSBI so that they can complete their assigned IS-related tasks on their own (Berndtsson et al., 2019). Scholars recommended that a more in-depth understanding was needed, one that

described BI experts' guidance for IT managers on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). This study may be significant in informing IT managers on guiding casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality to complete their assigned IS-related tasks successfully (Berndtsson et al., 2019).

Significance to Practice

The study may advance the understanding of BI experts' views on the CSFs that contribute to SSBI initiatives' success among casual users in the post-implementation stage. Supported by a CSF theoretical framework, IT managers can benefit from understanding essential elements for a business-driven approach to manage limited resources, increase BI success, and identify and scope of defining the (a) needs of the human resources for the organization, (b) business-driven, team composition, championship, and implementation processes, (c) applications of organizational BI system, (d) technologies for sustainable data quality and integrity with flexible and business-driven support, and (e) service strategies to support operations (Yeoh & Koronios, 2010; Yeoh & Popovič, 2016). At a macro level, Yeoh and Popovič (2016) suggested that a pattern exists for interpreting the CSFs related to SSBI solutions and suggested the existence of a standard set of CSFs for BI implementations. The implications of these capabilities to professional practice may improve IT managers' knowledge about CSFs that enable casual users to become more self-reliant, develop quality assurance and strategies for sustainability and competitive advantage (Aminy et al., 2019; Berndtsson et al., 2020).

The business–IT alignment is essential for combining the staff casual user's knowledge and skills with analytical technology (Alpar & Schulz, 2016; Aminy et al., 2019). For SSBI success, a fit occurs between casual users' skills and the demands of the SSBI (Alpar & Schulz, 2016). To use SSBI requires both casual users and BI experts (Bani-Hani et al., 2019). As organizations are developing SSBI solutions, IT managers need to know how casual users in the organization should work with analytics (Berndtsson et al., 2020).

Significance to Theory

Previous researchers have recommended future empirical studies to understand the challenges of using SSBI by casual users (Lennerholt et al., 2018, 2020; Weiler, Marheinecke et al., 2019). In practice, limited human resources, inconsistent data quality management, and inadequate analytic education can result in analysis mistakes and reduction in SSBI use (Baier et al., 2020). Casual users tend to use BI solutions that they perceive as easy to use and that meet their satisfaction (Blut et al., 2016). Often, IT managers do not develop strategies that support casual users nor integrate technology into their work practices or enhance their skills with analytics for decision making (Berndtsson et al., 2020). SSBI research is a topic for guiding the framework of a conceptual model and building theory as a result of research findings (Aminy et al., 2019; Blut et al., 2016; Yeoh & Koronios, 2010).

New knowledge is essential for SSBI research, and IT managers are challenged by the low rate of SSBI use and training for casual users (Lennerholt & van Laere, 2019; Lennerholt et al., 2020). This study may be significant to theory and extend academic

knowledge in guiding casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) through subject-matter-experts' views. The open nature of expert interviews may yield data from experts' breadth of knowledge and experience in research fields that still need exploring (Littig & Pöchhacker, 2014). From expert interviews, the data collected may reveal the information necessary for theory-building that is difficult or impossible to access from the fields of SSBI research to meet new challenges facing corporate executives in the current global market (Bogner et al., 2018; Littig & Pöchhacker, 2014).

Significance to Social Change

In the immediate, uncertain, post-COVID-19, business environment driven by the ever-increasing need of competing with analytics, bottleneck issues with casual user employees' SSBI can leave organizations unable to reach the competitive advantage needed for long-term sustainability (Bansai & Kumar, 2020; Hartmann & Lussier, 2020; Jacquin et al., 2020). The SSBI investment is expensive for decentralizing analytics and providing quality decision making for the staff of the casual user (Baier et al., 2020; Bansai & Kumar, 2020). Casual users can hold negative perceptions of BI and resist its use (Weiler, Marheinecke et al., 2019). There is limited understanding about facilitating the casual user's independence for data use and access to stabilize organizations in the turbulent socioeconomic times that are expected in the post-pandemic era (Hartmann & Lussier, 2020). To establish a data-driven culture, IT management must have a vision and strategy and increase casual users' BI skills (Bani-Hani et al., 2019; Berndtsson et al., 2019). The outcome of this study may drive positive social change by providing

executives a better understanding of how IT managers may develop training protocols to raise the BI competence of the casual user staff as one point of stability in a volatile and changing socioeconomic business environment.

Summary and Transition

SSBI is a tool to decentralizes data that allows the casual user staff the ability to analyze data and to make decisions. IT managers struggle with SSBI implementations for empowering users to work independently without IT support staff. IT managers have sparse information on the CSFs that enable casual users to fulfill their SSBI needs in the post-implementation stage. The multicase study was to describe BI experts' views on the CSFs that contribute to the success of SSBI initiatives among casual users in the post-implementation stage. To meet the study's purpose, a multicase study design was used with semistructured interviews from a purposeful sample archival data, and journaling/reflective field notes. This study may be significant in informing IT managers on guiding casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality to complete their assigned IS-related tasks successfully.

Chapter 2 will focus on the literature review, including the literature strategy and the BI-user framework. Two conceptual models will be introduced to frame the present study to align it with its purpose. I will address the literature gaps presented through the research problem by discussing different topics: SSBI retrospective of its application; defining power users and casual users; adoption and resistance of technology by casual users; CSFs for BI success models; CSFs related to casual users and BI success; IT management support for casual users; casual user training in strategic organizational

planning; and IT manager's knowledge gaps of casual user's implementation challenges in the post-implementation stage.

Chapter 3 is dedicated to the methodology and discusses the research method for qualitative, descriptive multiple-case study research. The chapter will include the research design and rationale, the researcher's role, the methodology for recruitment, and participation and data collection. As part of Chapter 3, the data analysis will address issues of trustworthiness and ethical procedures. In Chapter 4, I present the data analysis results to answer the research question. Procedures with detailed explanations will be given for collecting and analyzing the data from the 10 semistructured interviews. In the procedures, the interview protocol will be defined. The explanations will incorporate any unexpected organizational, procedural, or situational conditions occurring during data collection. It will also include provisional evidence of trustworthiness (credibility, transferability, dependability, and confirmability). In Chapter 5, I presented a case by case analysis of 10 participants, followed by a cross-case analysis and synthesis to answer this study's research question: How do BI experts describe their views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage? This multicase study showed the participants' insights and expert experiences, which emerged from the data analysis and can be attributed to the related themes and patterns presented in the study results.

Chapter 2: Literature Review

The social problem in this study is that many managers remain unsuccessful in developing their casual user staff into self-reliant BI users who can fulfill SSBI needs without the assistance of IT managers (Abas et al., 2020; Weiler, Matt et al., 2019). The specific management problem is that IT managers have sparse information on the CSFs for SSBI initiatives among casual users in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020). Even when casual users of BI give overall positive ratings to SSBI, many do not know how to use it properly (Passlick et al., 2020; Weiler, Matt et al., 2019). Scholars write that IT managers lack knowledge of the CSFs required for successful SSBI implementation (Villamarín-García, 2020; Weiler, Marheinecke et al., 2019; Yeoh & Popovič, 2016).

The extant literature on SSBI studies regarding casual users is mostly practitioner-oriented; because of this approach, there is a literature gap on BI experts' guidance on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). The purpose of this qualitative, multicase study was to describe BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.

In Chapter 2, I present the literature search strategy and the concepts that guided this empirical study. The literature review of this chapter includes a synthesis of knowledge and scholarly work on the following topics: adoption and resistance of casual users, BI skills needed for casual users, casual user training in strategic organizational planning, CSFs for BI success models, CSFs related to casual users, defining power users

and casual users, IT managers knowledge gaps of casual users' implementation challenges in the post-implementation stages, IT management support for casual users, and SSBI: A brief retrospective of its application.

Literature Search Strategy

This section gives details of the databases used to identify resources for the literature review. The resources included peer-reviewed articles, books/e-books, doctoral dissertations, and professional institutions' studies. The search results are presented in different categories.

The following databases were searched for relevant resources: Google Scholar, Google Books, ABI/INFORM Collection, Academic Search Complete, Dissertations & Theses @ Walden University, EBSCOHost, Emerald Insight, ProQuest Central, SAGE Journals, Springer e-books, Taylor and Francis Online, Thoreau Multi-Database Search, and Walden Library Books. The search included seminal articles and foundational research for the methodology. Peer-reviewed articles, not peer-reviewed articles, management and IT organizations (reports), student's theses, and books in the literature review were published between 2015 and 2020. Table 1 contains the numbers of resources by type and age of reference regarding all reference materials. With 144 resources, the literature review contains 64 references (44%), including 53 resources (83%) with recent publications between 2015 and 2020. In Table 2, I list the numbers of journal articles, books, e-books, and reports by topic, with 69% of the references comprising of peer-reviewed articles.

Table 1

Numbers of Resources by Type and Age of Reference

Age of references	2015-2020	2009-2014	2000-2008	1956-1999
Peer-reviewed articles	70	22	4	3
Not peer-reviewed articles	5	0	0	0
Management and IT organizations (reports)	3	2	0	0
Student's theses	1	0	0	0
Books	19	6	4	4
e-Books	1	0	0	0
Total	99	30	8	7

Table 2

Numbers of Journal Articles, Books, e-Books, Student's Theses, and Reports by Topic

Topics	Journal articles		Other resources		
	Peer-reviewed	Not peer-reviewed	Books/ e-Books	Student's theses	Reports
SSBI management	43	2	3	0	3
Methodology	46	0	31	0	1
Theory	10	3	1	1	1
Total	99	5	33	1	5

The key search terms process involved searching keywords: *self-service BI, user acceptance, ease-of-use analytic, ease-of-use, BI, CSFs user-reliance, user-reliance challenges, user uncertainty, user competency,* and *user training,* as well as *systematic review.* SSBI research is an emerging area of interest, so Google Scholar and professional societies, such as the Business Application Research Center and Transforming Data with Intelligence (TDWI), provided valuable information. I also reviewed journals that specialize in the topic of SSBI and IT management. To keep abreast of the newly published articles on the topic, I created Google alerts for SSBI, CSFs, and user-reliance. The use of additional keywords related to the dissertation was applied to the search to support the conceptual framework and the methodological research process

Conceptual Framework

This study was framed by two key conceptual models that focus on aligning with the purpose of the study, which was to describe BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage: (a) Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users that supports casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060), and (b) Yeoh and Koronios's (2010) The Framework of BI Success that introduced "an extensive framework identifying the CSFs influencing BI systems success" (p. 25).

SSBI Implementation Challenges of Self-Reliant Users

Lennerholt et al.'s (2018) concept of SSBI implementation challenges were based on Imhoff and White's (2011) definition of SSBI as a process that "facilities within the BI environment that enable BI users to become more self-reliant and less dependent on the IT organization" (p. 4) published in the well-known practitioner's report, Self-service BI: Empowering users to generate insight. SSBI aims to support a BI system that enables casual users to make decisions and be more self-reliant and less dependent on the professional user. Through a systematic literature review, Lennerholt et al. (2018) identified four challenges related to developing casual users into self-reliant users: (a) easy to use BI tools, (b) easy to enhance and use BI results, (c)) alignment between the casual user and BI tools, and (d) training for casual users to select, analyze, and understand data to make decisions. Awareness of these challenges can help practitioners avoid common pitfalls when implementing SSBI and guide scholarly researchers in focusing on their future SSBI research in building theory as a result of empirical evidence (Lennerholt et al., 2018; Yeoh & Koronios, 2010).

In a recently published study, Weiler, Matt et al.'s (2019) extended Lennerholt et al.'s (2018) four SSBI implementation challenges of self-reliant users to include less-mentioned challenges of user uncertainties and user adoption arising due to SSBI deployment. Weiler, Matt et al.'s (2019) grounded his two challenges in economics theory, defining uncertainty due to a lack of information about the future, a decision-making situation, and an inability to predict or understand the technology environment (Knight, 2013). Weiler, Matt et al (2019) developed their findings around user adoption

models and resistance behavior during SSBI implementations and suggested that implementing a new IT system can cause emotions that drive user responses to technology.

The Framework of BI Success

Yeoh and Koronios (2010) examined the CSFs and the contextual issues required for BI implementations and developed *The Framework of BI Success* with the *IS Success Model* (DeLone & McLean, 1992). Yeoh and Koronios (2010) used a grounded theory approach in their seminal study to build a new theory to create their theoretical framework on how CSFs impact BI systems implementation. From a managers' perspective of organizational operations, the CSFs concept is the essential organizational factor in certain areas that leads to successful competitive performance, and poor results lead to reduced efficiency (Rockart, 1979). Yeoh and Koronios (2010) developed a two stage study, an exploratory Delphi study and five case studies of large and complex organizations, and found that BI implementations fail when IT managers focus primarily on technology compared to organizations that emphasize the business processes to drive competitive advantage.

In the contextual environment, Yeoh and Koronios (2010) suggested BI success is also relevant to the factors related to the surroundings and interrelationship of the organization, process, and technology for the perceived business benefit. To further the SSBI research, Aminy et al. (2019) focused on factors that enable SSBI success, suggesting organizational transparency to improve communication, casual user involvement for better workflows, and training for proper management of SSBI systems. With a systematic analysis approach, Vargas and Comuzzi (2020) expanded Yeoh and

Koronios's (2010) model to study the implementation of enterprise resource planning and the contextual factors of organizational nationality, size, economic status, and culture, as well as industry sector and type. Vargas and Comuzzi's (2020) study concluded that culture impacts the priority of CSFs in gaining a better understanding of BI implementation due to perceptions of uncertainty avoidance, individualism, and power distance.

Literature Review

SSBI: A Brief Retrospective of its Application

As a construct of SSBI, IT management is a complex system of value chains at all organizational levels, internal and external, that requires collaboration and up-to-date, complete, and accurate information from enterprise information systems and technologies to make strategic decisions (Villamarín-García, 2020). In an examination of decision support system articles between 2002 to 2012, the most common application areas are production and operations management applications, with 58.80% (30 of 51) for public corporations, then marketing, transportation, logistics, human resource, management information systems, strategic management, and finance (Kim & Eom, 2016). IT management is responsible for coordinating the BI implementation, adoption, and training (Bansai & Kumar, 2020; Berndtsson et al., 2019). With the objective of the collaborative organizational effort of technology initiatives, IT management aims to decentralize data to gain more data access and analytical capabilities and reduce IT support for casual users (Jacquin et al., 2020). The SSBI initiative is designed to enable employees to perform analytical queries based on filters, generate reports, and make

decisions with applied knowledge about the data and the system (Burke et al., 2016). Organizations implement SSBI to confront the challenges of data accessibility and reliability, and casual users' need for flexibility and agility in their work routine (Alpar & Schulz, 2016).

The decentralization of data is a process of *analysis democratization* to empower casual users to analyze data and review information (Alpar & Schulz, 2016). As analytic capabilities shifts to casual users, IT managers realize the need to raise analytical competency and increase self-reliance among casual users (Berndtsson et al., 2019). It requires simplified and easy to use BI tools and training resources for casual users with various backgrounds (Jacquin et al., 2020). A data-driven culture is created with advanced analytical capacities to deliver the appropriate data to the right casual users and power users (Anderson, 2015). Nurcholis and Cahyono (2020) found that improving IT strategy alignment can be accomplished by using SSBI to increase responsiveness, operational flexibility, and business relationship for Batik Small and Medium Enterprises (SME), and therefore gain a sustainable competitive advantage. The use of data analytics is only effective for IT management as firms coordinate the fit between the organizational BI tools, data, people, and tasks (Ghasemaghaei et al., 2017). IT managers need to develop a data-driven culture by establishing strong leadership that promotes a clear vision, trust, innovation, and training strategies for casual users to gain skills with data analytics and BI tools (Berndtsson et al., 2020). Within this culture, casual users adopt SSBI to make decisions (Anderson, 2015).

SSBI has evolved from the advancement of computing power, vast amounts of data, and BI, and as technology has changed, so has the approach and attitudes of management for how the casual users make decisions (Mortenson et al., 2015). The traditional BI concept is extended with the idea of self-serve; it is related to the ease of BI use or user-friendliness of BI systems that allows casual users to access and create information in collaboration with power users (Alpar & Schulz, 2016). Rinkenberger (2020) suggested that smaller business analytics projects can limit the Power BI tool's development among the employees and use a few data sources; therefore, the SSBI is not fully developed. The potential of SSBI can present numerous possibilities for employees, yet user access and use of reports are affected by the scope of the SSBI project. BI and analytics offered a better approach to quality information for decision making through tools and technology that is valuable yet expensive to develop and operate (Bansai & Kumar, 2020). For a BI model to remain sustainable, Burke et al. (2016) suggested a midtier center of excellence solution consisting of a select group of individuals who possess data skills to validate data, understand the stored data, and apply data governance.

With SSBI, the purpose is to enable the casual user to access relevant information from large amounts of complex data without IT support and accomplish their tasks more easily and quickly with SSBI than the traditional BI (Alpar & Schulz, 2016). According to Kim and Eom (2016), the technology is designed to support the semistructured problems for middle-level managers who use different analytical models to generate alternative solutions or various methods to extract useful information from vast amounts

of data. With a different perspective, Imhoff and White (2011) described the SSBI as a tool to support the tasks of data discovery and decision making with easy to access data with meaningful information, easy to consume BI results, easy to use analytic capabilities, and BI reporting, including enhancements with user interfaces and collaboration, and easy to manage data warehouse solutions with integration of data sources. An SSBI solution is not an approach to fit all casual users; the BI tool requires an IT manager to understand the needs of the casual users (e.g., tasks, informational demands, computer skills, analytic skills). Often casual users experience difficulty with the SSBI due to the data quality and their access and use of data (Lennerholt & van Laere, 2019).

At a macro level, IT managers are more likely to succeed with the CSFs through a business-oriented approach when the specific needs are identified for the people, process, technology, application, and strategy relating to the implementation's nature and scope effort (Yeoh & Koronios, 2010). They develop key performance indicators to monitor the BI performance and users in the SSBI environment and data governance to ensure data quality and consistency (Berndtsson et al., 2019). In an organization, IT management is exploring and adopting new methods to analyze data for better decision making to gain a competitive advantage (Bansai & Kumar, 2020). BI tools are built with semantic layers linked to data structures in the interface that provide data meaning for decision making and data sharing for the casual user (Antunes et al., 2016). With model-based or data-driven analytics, the most often used methods are artificial intelligence and domain-specific learning solutions (Kim & Eom, 2016).

Other decision-making tools used are communication-driven or knowledge-driven methods that allow for collaboration and knowledge sharing for bottom-up decision making (Antunes et al., 2016). IT management is improving efficiencies with the automation of standardized reports (Berndtsson et al., 2020). Technology is a tool that provides casual users with the ability to connect to each other, share information among themselves, and enhance their decision making capabilities. Organizations are finding benefits with the flexibility of cloud-computing and BI services as a new outsourcing alternative for add-on functionality, tool integration, and solution provision (Ereth & Dahl, 2013). As artificial intelligence advances, it supports human decision-making to process activities through automation, detect patterns in data, interpret meaning from information, and engage with casual users by offering recommendations (Duan et al., 2019).

Web technology is used by casual users to enhance their ability to share information and make decisions with semantic tools by handling and organizing information content across multiple pages or sites that intertwine with decision support systems and BI (Antunes et al., 2016). Mobile devices allow for real-time information and location-awareness features to improve decision making with time constraints and collaboration goals for mobile operations (Kim & Eom, 2016). In the business and technical context, Villamarín-García (2020) recommended a better understanding of certain factors (e.g., social, organizational, environmental, technical, and information) influencing collaboration for planning and implementation of BI solutions from the casual users perspective of acceptance, which affects BI success.

SSBI systems are tools of great promise in alleviating the constraints of bottlenecks between business and IT, reducing the silos among teams, and helping organizations transform themselves into analytics competitors (Imhoff & White, 2011; Lennerholt et al., 2018). The demand is high among practitioners, and many IT managers report that SSBI has been on organizations' wish list for many years (Baier et al., 2020). IT managers know that SSBI solutions can improve the efficiency in their organizations through better management of resources. IT managers are not always sure how to leverage SSBI systems, and the academic literature surrounding SSBI systems is scarce (Bani-Hani, Pareigis et al., 2018; Lennerholt et al., 2018). Most of the IT managers who have adopted SSBI report their success rate as low and indicate an interesting research area in providing practitioners with a model guiding them towards successful SSBI initiatives (Lennerholt et al., 2020). The literature is mostly practitioner-oriented, and there exists a lack of scientific studies that maps the factors that contribute to successful SSBI initiatives.

Defining Power Users and Casual Users

Casual users' access and use of self-serve BI is a benefit for organizations to reduce the workload of IT departments (Lennerholt et al., 2018). Because of the limited IT staff and skills, IT management is incentivized to decentralize data and empower casual users to analyze data and complete tasks independently (Jacquin et al., 2020). A socio-technological environment is created; power users and casual users coexist to accomplish analytical tasks with various capacities due to their different roles for achieving organizational goals (Alpar & Schulz, 2016).

In the organizational context, Aminy et al. (2019) suggested that user management is a CSF for enabling SSBI success, proposing that governance is necessary to evaluate user skills with their access and understand their areas of interest. Like Aminy et al. (2019), Bele (2019) proposed that the people, politics, and policies are the critical factors for BI success by focusing on business needs, not IT needs. Considerations for casual users are necessary for planning and developing SSBI solutions to design features that meet their needs. Individuals can be explorers with motivations to use technology and pioneers with positive perceptions of technology (Blut et al., 2016). Social interactions can improve decision making and increase productivity, but it also invites personal incompatibilities and conflicts (Villamarín-García, 2020).

In the 2017 Business Application Research Center (BARC) BI Trend Monitor report, 70% of 2,680 individuals identified themselves as casual users, while 25% described themselves as power users (Baier et al., 2020). The power users are the experienced BI users, or IT professionals integrating data sources with extensive access to data for building reports on request, while casual users need real-time analysis for relevant data to make decisions (Alpar & Schulz, 2016). In BI implementation, both power users and casual users must collaborate to understand their roles and responsibilities for BI planning purposes (Villamarín-García, 2020). The output of the SSBI is defined by their use of the system (Yeoh & Koronios, 2010).

Casual users and power users approach BI's development, management, and activities with different perspectives (Alpar & Schulz, 2016). In a case study, Bani-Hani, Pareigis et al. (2018) explored the two major phases of building an SSBI service, co-

production, co-creation, and collaboration integration between IT staff and casual users are essential in reducing technical support and increasing freedom for data exploration. Power users focus on the technical aspects of the BI by analyzing and integrating large amounts of data to produce reports. Often IT managers do not necessarily understand, nor do they need to know the technical aspects' details to develop reports by power users (Bele, 2019).

Technical inconsistencies can occur in the measurements, practices, data processing, and record collection, which reduce data integrity and quality when assessing the various constructs and variables (Penner & Dodge, 2019). In the past, power users were accountable for understanding data quality and different data; this responsibility has shifted to casual users (Berndtsson et al., 2019). Casual users do not have the technical background of power users and use BI tools to filter, sort, analyze, and visualize data without IT support (Bele, 2019). With the development of SSBI, technology has changed the analytical tasks and workflow of the power users and casual users (Alpar & Schulz, 2016).

In aligning business and technology, there is a balance between freedom of access and restrictions to perform efficient data analysis and promote innovation with analytical tasks (Aminy et al., 2019). As a user becomes more self-reliant with more analytical skills, the user gains more access and data in the SSBI environment (Alpar & Schulz, 2016). The casual users increase their analytical competencies, and effectively use data for decision making, empowering the individual to complete tasks. With SSBI tools, the environment is also a fit between the casual user's skills and demands of the SSBI

solution that depends on the individual's ability to learn new technology and users' technical interest (Aminy et al., 2019). Both power users and casual users can explore, converge, and share information at various capacities depending on their individual characteristics and technology interactions. With administrative purposes, data governance is developed to oversee users' activities, ensuring appropriate data access and use and data quality (Aminy et al., 2019). Providing governance is the responsibility of IT management; they create a vision and strategy to develop training and the data-driven culture (Berndtsson et al., 2019).

Power users and casual users do not possess the same knowledge and skills; their abilities for analyzing data can vary within the group (Alpar & Schulz, 2016). Training is often necessary for both casual users and power users because they lack the knowledge and skills to meet a certain level of competency (Bele, 2019). Training is an approach to improve competencies for both casual users and power users. In developing countries, they often have less experience with technology implementation than developed nations, emphasizing software development, and user training (Vargas & Comuzzi, 2020).

Power users and casual users have different analytical activities, yet when individuals have different knowledge or perspective of a task, a conflict can occur (Larrick, 2016). During implementation, teams need to create effective training programs about the new work process in the SSBI and communication strategies to improve work routine changes (Laumer, Maier, Echardt et al., 2016). Team awareness and communication is an approach to promote collaboration among team members and IT management and address conflict regarding changes. With a collaboration of select power

users and casual users, a joint project can be created to design a training program and build trust with other employees (Berndtsson et al., 2019). The exchange of knowledge can support efficient decision-making collection, process, and interpretation of data (Janssen et al., 2017). As team members share ideas and experiences, an individual provides a perspective from their workflow and expertise and how they make decisions. Communication and previous experience can improve workflows between users and intend to use the SSBI (Passlick et al., 2020). With a small group of staff members, Berndtsson et al. (2019) suggested that individuals can provide opportunities and problems from a different perspective to resolve SSBI solutions issues.

Trust is essential for developing a shared belief and the ability to take risks from power users and casual users that create team cohesion (Larrick, 2016). The collaboration between power users and casual users enables individuals to contact other departments for assistance proactively to resolve issues (Berndtsson et al., 2020). Trust is a foundation for individuals to seek interactions from others and solve problems. It creates a bond between casual users and power users. In cultures with high individualism, a champion's presence is important to integrate groups compared to the influence of social norms in collective cultures (Vargas & Comuzzi, 2020). Within a group, an individual's trust promotes interactions with other people to become involved in projects (Villamarín-García, 2020). By creating relationships, both power users and casual users overcome the fragmentations of knowledge and understand the data to make better decisions (Janssen et al., 2017).

The guidance of top management support is a critical factor for BI success in developing BI solutions and organizing collaboration efforts for power users and casual users (Villamarín-García, 2020). By developing an SSBI business case, IT managers must gather business requirements from different organizational teams, including power users and casual users (Yeoh & Koronios, 2010). Business requirements describe how corporate teams achieve goals and the process flow and tasks of the users. Power users and casual users describe goals, process workflow, and tasks to develop SSBI features and functionality requirements. IT managers can create an environment that promotes individual participation without becoming a domineering leader (Larrick, 2016).

Individuals can more easily approach their leaders with their ideas through consultation, or individuals can exchange opinions in groups when cultures permit more equal discussions (Vargas & Comuzzi, 2020). In developing the business case, user participation and information collection are affected by leadership and culture and social dynamics. The business case is a detailed analysis of the SSBI business needs and increases upper management (Yeoh & Koronios, 2010). As a vision, it also a plan that empowers users to perform their daily work more efficiently by establishing a common goal (Berndtsson et al., 2019).

User participation is needed for change management to help identify requirements and meet power users' expectations and casual users (Yeoh & Koronios, 2010). A new paradigm shift, such as the introduction of augmented analytics, changes the power position of the user role in making decisions and requires appropriate strategies for responding to disruptions in the data and the analytical market (Abas et al., 2020).

Technology advancements will change how users interact with technology. The casual users and power users' perspective can provide IT managers, with information on how to develop a plan for these changes. In unexpected events, power users and casual users are affected by the immediate changes when attempting to continue assigned tasks with how they perform their activities and their abilities in adjusting to new technology and their psychological well being (Hartmann & Lussier, 2020). As these events occur, IT managers can help reduce uncertainty and encourage user engagement, improving organizational processes (Villamarín-García, 2020).

Adoption and Resistance of Technology by Casual Users

SSBI systems make it possible for organizations to reduce costs, share data and information, and enhance management of business processes, by coordinating processes and functions previously supported by legacy systems (Weiler, Matt et al., 2019). The initial purpose of SSBI was to drive cross-functionality and process-centered operations designed for specific industry sectors such as finance, human resources, purchasing, manufacturing, and sales. The existing literature indicates that user resistance to adapt SSBI is one of the biggest challenges in information systems at the post-implementation stage (Passlick et al., 2020) at both a regional and international level.

At the post-implementation stage, there will be many social and technological system changes, which could make user resistance even more significant among casual users of BI because many may lack the knowledge needed to use it properly (Passlick et al., 2020; Weiler, Marheinecke et al., 2019). Casual users’ resistance to SSBI systems tends to lead to departmental over-budget spending, delays in the project, or

underutilization of the system. Much research has focused on user acceptance in a voluntary context, but this is somewhat limited in explaining user resistance in a mandatory context such as in the post-implementation stage within a digitized organization or department (Berndtsson et al., 2019).

Organizational collaboration can improve BI project implementation and maintenance to seek improvements in their adoption, performance, and use rates by linking strategic vision through practical tasks and procedures, requiring IT managers and users (Villamarín-García, 2020). A project champion's support is the most critical factor in the BI adoption process and development and management support (Puklavec et al., 2018; Yeoh & Popovič, 2016). The project champion can assist the change of attitude of culture for users to adopt SSBI. It requires building capacities in project management and on-going competence across all organizational levels to optimize workforce transformation and leverage opportunities (Eden et al., 2019).

Challenges exist with unclear responsibilities between IT and business, noncompliance of quality features, minimal data governance and data management resulting from errors in project management: inadequate risk management of the Power BI implementation, weak requirement gathering, and appropriate approach for project management (Rinkenberger, 2020). In the context of the organizational and technical environment, user uncertainty and environmental change can influence the casual users' interactions and abilities to complete analytical tasks with BI tools effectively (Hartmann & Lussier, 2020; Weiler, Matt et al., 2019). Project management, upper management support, and a focus on developing individuals' competencies can change a culture to

reduce uncertainty and promote BI tools' interactions. Without workflow strategies, IT managers lack information about how people should work with analytics, leading to an absence of the user understanding and skillsets to perform work routines and create resistance (Berndtsson et al., 2020).

Adoption does not mean the absorptive capacity of the users' ability to effectively implement it and accept an innovation (Dunican & Keaster, 2015). For users to adopt technology, IT managers need to focus on change management and training for technology and new work routines and communications strategies (Laumer, Maier, Echardt et al., 2016). With the guidance of a change management plan, communication and training are approaches to increase knowledge and awareness of users' changes to accept the shifts in their tasks and work patterns. Focusing on absorptive capacity, IT managers recognize the value of casual users' ability to use use the SSBI, enhance, and effectively implement new technology (Dunican & Keaster, 2015).

Data-driven cultures enable casual users to adopt and effectively use SSBI (Bani-Hani et al., 2019). Users who gain competencies with SSBI and understand how to analyze data appropriately improve their ability to make decisions. The nature of an organization’s culture is vital for SSBI adoption that requires building a foundation to prepare casual users to effectively use the system, overcome user resistance, and engage casual users to active learning at all levels and commit to the organizational change (Eden et al., 2019).

IT managers need to consider the organizational strategy and demand for information and a centralized SSBI model to sustainability data, technology, and business

(Burke et al., 2016). During the development of innovative products, Dunican and Keaster (2015) suggested that knowledgeable workers often provided product functionality information that led to higher adoption rates. With a different approach, Berndtsson et al. (2019) proposed a joint-internal team with a combination of skilled users can offer insight to develop an SSBI initiative to assist with training, hence adoption. In each approach, user participation and team composition are essential to capture casual users' knowledge and experiences and power users to develop and implement the SSBI tool (Eden et al., 2019).

Adoption is also guided by a clear governance structure to involve casual users with a collaborative vision. The governance is information about the access rights of casual users, data quality, and the protocol for security breaches that restrict SSBI use, yet it can be flexible to encourage creativity and exploration (Alpar & Schulz, 2016). Governance is the parameters of the SSBI and the area within the SSBI to maintain order for achieving an organizational goal. The policies and rules are developed to support and instruct users in their tasks without interfering with their abilities to solve problems. In organizations, data governance requires different rules for various teams to maintain data quality and access (Clarke et al., 2016).

Casual users may resist the change process due to a manifestation of fears caused by uncertainty, which is often a behavior intended to protect oneself (Dunican & Keaster, 2015). The disruption of services and users' inability to work may also create user resistance as a risk factor for SSBI use (Popovič, 2017). Factors contributing to user resistance are casual users’ interest, tasks, and perceived ease of the SSBI system (Aminy

et al., 2019). Laumer, Maier, Echardt et al. (2016) suggested that user resistance is based on a psychological and subjective process, and the users' negative perceptions of technology lead to negative perceptions of the work routines; hence technology becomes an object of resistance. User resistance is a risk of the unknown when users perceive uncertainty caused by fear, unexpected events, or alterations to tasks. Often, work routine changes can invoke ambivalent emotions from the user, leading to resistant behavior (Weiler, Marheinecke et al., 2019). Data stewards may help casual users acquire the skills and responsibilities of the SSBI initiatives and develop trust in the use of Power BI and the importance of data governance (Rinkenberger, 2020).

The success or failure of SSBI solutions is dependent on the users' interaction with technology acceptance. With the technology acceptance models, Blut et al. (2016) suggested that demographic variables of age and gender are not predictors of use or intent to use self-service technology. Age and gender do not predict the users' resistance to change concerning mindfulness and tolerance for uncertainty, except for cognitive rigidity, where females showed a significant difference from males (Dunican & Keaster, 2015). In Rahman's (2020) study, he reported that the technology acceptance model variables, perceived usefulness, behavioral intention to use, and actual use, are valid for new and technologically complex system implementation from an industrial/organizational level users' acceptance context of big data. With the same model, Laumer, Maier, Eckhardt et al. (2016) showed that the individual's personality traits (e.g., routine seeking, emotional reaction, short-term focus, and cognitive rigidity) are important predictors of how individuals perceive and react in organizations with

mandatory IS, reporting that individuals tend to perceive change negatively rather than positively. Previous researchers have shown that demographic data or personality information may not provide evidence for predicting the adoption or resistance of SSBI initiatives. Other researchers provide a different explanation. Instead of user resistance, Aminy et al. (2019) suggested that failed SSBI initiatives occur due to the risk of allowing too many unauthorized users.

Casual users are less independent and involved with analytical tasks when integrating data resources and exchanging service because they lack specific technical resources, trust in data, self-confidence, or institutional support (Bani-Hani et al., 2019). In a case study with different organizations, some align technology with goals to increase adoptions through knowledge transfer by establishing committees and hiring external consultants to develop monitoring standards; others focus on relationships to prevent conflicts and misunderstandings during knowledge transfer (Daghfous & Ahmad, 2015). IT managers use various approaches to encourage team trust, build confidence, and increase knowledge sharing. Aware of the challenges, Popovič (2017) developed a framework to evaluate the BI post-acceptance stage and suggested that the effect of user resistance is understanding the relationship between the individual, organization, and technology factors to ensure resistance does not result in significant organizational disruptions.

CSFs for BI Success Models

IT managers have limited knowledge about the CSFs for BI solutions concerning casual users' social dynamics and perspectives, work routine changes, and business-

technology alignment (Weiler, Matt et al., 2019; Yeoh & Popovič, 2016). IT management is challenged with developing easy to use BI tools and education for better decision making that empowers casual users (Lennerholt et al., 2018). A gap exists in understanding the casual users' requirements and needs for increasing their competencies and SSBI adoption. Often, casual users struggle to analyze data and make decisions because they have problems accessing and understanding the data (Lennerholt & van Laere, 2019). Casual users can fail to use or adopt BI because they fear artificial intelligence, lack appropriate skills and resist changes in workflow or decision making strategies (Popovič, 2017).

From a managers' perspective, the CSFs are factors that enable stakeholders to optimize their limited resources by focusing on essential areas of interest for BI implementation and organizational operations that lead to increased competitive performance; without CSFs, it leads to poor results and reduced efficiency (Yeoh & Koronios, 2010). The assumption is that the presence of CSFs is necessary for SSBI implementation success; absence leads to failure (Rockart, 1979). IT managers leverage resources to benefit from technology for enhancing business operations that lead to an organizational goal. Yeoh and Koronios (2010) extend Wizom and Watson's (2001) research with data warehousing success in a cross-case analysis. Wizom and Watson (2001) developed a research model with a cross-sectional survey and structured interviews, suggesting that data quality and system quality link between implementation system success and the perceived net benefits. Regarding Yeoh and Koronios's (2010) model, Aminy et al. (2019) studied BI success associated with the challenges and risks of

data access and use with casual users by interviewing both BI consultants and BI managers and developed a conceptual model that proposed that CSFs are essential in SSBI success.

With the DeLone and McLean's (1992) IS success model, Aminy et al. (2019), Yeoh and Koronios (2010), and Wizom and Watson (2001) explored the implementation success of BI, SSBI, and data warehousing solutions for operations, technology, and processes based on the perceived benefits. All of the research studies had a similar foundational framework, but each research study focused on different technology types. The framework is based on the system's influence and information quality upon the technology use and user satisfaction at an organizational and individual level associated with the perceived net benefits (DeLone & McLean, 1992). The BI output of information is defined by Mason's (1978) levels of communication theory that suggest information flows through a sequence of stages, adapted from Shannon (1948) semantic levels of information.

With a focus on SSBI and BI technologies, Yeoh and Koronios (2010) explored the elements for the CSFs, then assessed the importance of the factors influencing the success of BI implementation. Aminy et al. (2019) developed a conceptual model to help practitioners and researchers better understand the CSFs that contribute to successful SSBI initiatives. The CSFs are areas of interest for IT managers to guide them in planning and implementing SSBI and BI solutions. Their research showed that organizational and process factors are essential in BI implementation success (Aminy et al., 2019; Yeoh & Koronios, 2010).

In a case study, Aminy et al. (2019) selected BI consultants who were chosen because of their perspective and broad scope of the SSBI factors. BI managers were selected from senior-level IT or business positions from organizations with any type of SSBI to gain an internal perspective of the factors because of their relevant experience with SSBI implementations (Aminy et al., 2019). In a different approach, Yeoh and Koronios (2010) conducted a two-stage qualitative inquiry-Delphi study to derive a preliminary CSF framework from interviews and a survey with 15 BI experts. Both researchers employed the assistance of experts to gather their insights about CSFs. The study continued with five case studies with semistructured interviews from BI stakeholders and collected project documents from various organizations, including a cross-case analysis to examine CSFs for similarities and differences (Yeoh & Koronios, 2010).

Each researcher presented variations in the construction of the conceptual frameworks that depended on their study's purpose. Aminy et al. (2019) investigated the casual users' access and use based on their difficulties with SSBI, proposing that the decision environment of operational and strategic decisions acts as a mediator between the organization and technology that influence the CSFs for SSBI success. Yeoh and Koronios (2010) evaluated the BI implementation from an organizational perspective, suggesting the perceived benefits from the implementation success is a loop of feedback from the users about their interaction with the BI to meet business needs. Both researchers had feedback loops that influenced the CSFs from the organizational context and technological context. In the models, the variations occurred with the contextual

dimensions due to the different approaches from the IT management perspective and user perspective. In the SSBI environment, the implementation success is influenced by the infrastructure and processes performances based on the SSBI business alignment with the organization's CSFs, process, and technology (Yeoh & Koronios, 2010).

In Yeoh and Koronios's (2010) model, infrastructure performance relates to system quality, information quality, and system use, and process performance involves the schedule and budget. The system quality is flexibility, scalability, and inoperability of the information processing (Yeoh & Koronios, 2010). Information quality is related to the usefulness of information produced by the system (e.g., accuracy, completeness, timeliness, relevance, consistency). System use is defined as the casual users' consumption of the SSBI system (Yeoh & Koronios, 2010). These factors are focused on the functionality and capability of the BI system. Unlike Yeoh and Koronios's (2010) model, Aminy et al.'s (2019) framework included a decision environment involving organizational decisions of structured decisions for operational control and strategic decisions of unstructured decisions for planning strategies.

As they developed different models, Yeoh and Koronios (2010) and Aminy et al. (2019) addressed several overlapping topics. From an intra-organizational perspective, corporate affairs for user and change management, data governance for quality and integrity, and upper management support for collaboration are critical factors influencing BI success (Aminy et al., 2019; Yeoh & Koronios, 2010). In the organizational context, Aminy et al. (2019) described the fit between the users' role, skill, and needs that require training to meet task demands and freedom to explore data. From a training perspective,

it is a collaborative effort among users to learn new knowledge, share information, and develop additional skills that improve job performance. It also includes user resistance as an emotional response of users to manage uncertainty (Aminy et al., 2019). As a CSF, a senior manager is responsible for aligning the business with the technology, ensuring financial commitment, and providing adequate staffing (Yeoh & Koronios, 2010). Aminy et al. (2019) and Yeoh and Koronios (2010) included the business-driven approach to SSBI initiatives of the business–IT alignment to gain a competitive advantage. The assumption is that the alignment of the casual users' skills and needs leads to high-quality decisions with the appropriate data governance for user innovation (Aminy et al., 2019).

Implementation of CSFs for BI success requires a clear, long-term vision with a well-established business case with all relevant stakeholders' involvement that supports the casual and power users' needs and legislative compliance and audit requirements (Yeoh & Koronios, 2010). Data governance is a big challenge, and SSBI success happens with strong governance that ensures data quality without discouraging users' innovation (Aminy et al., 2019). User freedom is balanced with data quality and organizational goals by encouraging users to develop business requirements and data governance. With BI solutions, Yeoh and Koronios (2010) found that project management requires a business-driven process with an iterative development approach for planning that facilitates flexibility and adaptability with changing requirements. The assumption is an effective strategy, governance, and the iterative development approach of project management planning that involves users improves SSBI success (Aminy et al., 2019).

At the inter-organizational level, leaders are identified as professionals that engage and involve other participants, prioritize personal learning by gaining knowledge from multiple areas of interest, and connect other individuals with experience and expertise to get projects done (Villamarín-García, 2020). IT managers need to create a culture that fosters cooperation between business and IT management with clearly defined roles and responsibilities for tasks and workflows (Aminy et al., 2019). An effective champion is linked to organizational implementation and project success to ensure the careful management of the organizational challenges that arise during the project (Yeoh & Koronios, 2010). Upper management support is the leading driver to obtain goals, encourage collaboration, and guide change to foster the culture's transformation to pursue SSBI success. The champion oversees the activities or processes that determine the collaborative effort between team members teamwork at an intra-organization level (Villamarín-García, 2020). The assumption is that management support effectively collaborates with individuals and encourages user participation (Aminy et al., 2019).

In a team, the members' composition and skills significantly influence implementation success (Yeoh & Koronios, 2010). An individual's expertise and available technology will help the teams achieve their goals (Villamarín-García, 2020). Training is necessary to achieve SSBI success for educating users on managing the SSBI system and adjusting to their changing roles (Aminy et al., 2019). Through training, users gain more valuable skills to interact with the system, enrich their team environment, and enhance their expertise. In BI implementation, casual users adopt technology when they

perceive an easy to use system that aligns with their tasks (Blut et al., 2016). The assumption is that a team's skills determine the level of BI access and use, and training improves the users' ability to adapt to their role (Aminy et al., 2019).

At an intra-organizational level, CSFs relate to personal trust for promoting relationships with other team members and user empowerment to increase confidence for users' participation and contributions (Villamarín-García, 2020). As a CSF, user-oriented change management is required for user participation during the process of change that can lead to better communication of their needs, which can help ensure the successful introduction of the system (Yeoh & Koronios, 2010). Users can discuss their needs and requirements, as well as their expectations to interact with the system. IT managers can gain a better understanding of how to develop and implement SSBI for user adoption.

In the technology perspective, Aminy et al. (2019) identified data quality as a CSF to ensure user trust with the stipulation that it is not a deterrent for user freedom. As users interact, trust is support for communication and participation among individuals for sharing knowledge that helps them adjust to change. The assumption is the social dynamics and norms create an emotional response from changes in user roles and workflow that require appropriate change management to improve trust (Aminy et al., 2019).

The use and access to information is a crucial asset to users' power position at the inter and inter-organizational level (Villamarín-García, 2020). By gaining authorization, power is distributed to users that allow them to access and use data to gather information and make decisions. Aminy et al. (2019) suggested the need for governance to balance

the SSBI users' skills and access to data. With governance, users are instructed on the standards and rules for data quality. As the SSBI matures, IT managers develop governance as an ongoing oversite for an organization that allows for users' freedom with incremental SSBI access depending upon the user's skills to use the SSBI system, hence flexibility with the system (Aminy et al., 2019). The governance is structured to align the user access and responsibility with the organizational goal. Users also gain information from governance on their status to obtain certain private or confidential information. In the context of technology, Aminy et al. (2019) considered the semantic layer strategy as a CSF for users to understand the meaning of data and increase the SSBI use. As part of the data governance, the users need to understand the data meaning from the semantic layer of the SSBI for data management. Yeoh and Koronios (2010) also found that users benefit from meaningful data with standard measures and definitions and data consistency and interpretability. The assumption is that BI's access and use relate to the user role and skills; increasing skills leads to increasing access (Aminy et al., 2019).

With SSBI success, Aminy et al. (2019) focused on the casual user perspective of ease of use to adopt SSBI and data access, and Yeoh and Koronios (2010) explored the organizational view of BI implementation for a competitive advantage. Aminy et al. (2019) identified data quality as a dimension that becomes a risk for errors due to inadequate training of users with power users possessing a higher level of understanding of the semantic layer than casual users. With easy to use BI tools, previous researchers suggested it requires training or on-going training (Aminy et al., 2019; Yeoh & Koronios, 2010); users want to have a simple approach to understanding the data relationships and

meanings that help them perceive data quality. For SSBI success, the organizational and user perspective is a requirement for easy to use technology and training for users that increase their knowledge about workflow changes.

In the findings, Aminy et al. (2019) suggested that the success of SSBI occurs when casual users can easily use SSBI based on (a) user management for data access and use, (b) collaboration between IT management and business-driven operations, (c) data quality for decision accuracy, (d) data governance for SSBI maturity, and (e) semantic layer strategy for usability. In Yeoh and Koronios's (2010) study, they stated that the system is designed to be business-driven, scalable, and flexible to accommodate scalability and flexibility requirements based on (a) committed management support and sponsorship, (b) clear vision and business case, (c) business-driven and iterative development approach, (d) user-oriented change management, (e) business-driven, scalable and (f) flexible technology, sustainable data quality, and integrity. With successful SSBI solutions, the needs and the abilities of the casual user need to be consider when developing functionality and tools for workflow and analytic tasks that align with organizations' goals. IT managers can support casual users by providing education about data management, governance, and changes in requirement so users can understand their roles and gain competencies to use data and make decisions. Yeoh and Popovič (2016) extended Yeoh and Koronios's (2010) study; they reported that nontechnical factors play a more important role in the CSFs (e.g., organizational strategy, committed management support and sponsorship, process business-centric and balanced

team composition) than technological and data-related factors (e.g., business-driven, scalability and flexibility technical framework or data quality and integrity).

Aminy et al. (2019) stated that the data culture involves all organizational levels with the transparency that encourages understanding between various teams to increase the consistency of deliverables and process management of data analytics. Users become self-reliant and empowered with the use and access of data and limited IT staff assistance. Aminy et al. (2019) suggested the decision environment is not a significant factor in the SSBI success. Yeoh and Koronios's (2010) study found that even though a set of critical success standards exist, differences occur in contextual elements with each project needs to identify the CSFs in the right sequential order. The CSFs are focused on human resources, social dynamics, processes, and leadership to deliver a successful SSBI solution. Yeoh and Koronios (2010) and Aminy et al. (2019) emphasized the importance of the contextual factors of organizational and processes on technology success.

CSFs related to Casual Users and BI Success

IT managers often misalign the development and deployment of SSBI with the lack of knowledge concerning the CSFs to improve casual users' analytical skills and personal trust for SSBI adoption. (Weiler, Marheinecke et al., 2019). The degree to which the BI tool and results meet the casual users' expectations and skills is linked with BI success and the user resistance and adoption of the SSBI tool (Aminy et al., 2019). The casual user expects to understand the data and make decisions from vast amounts of data from BI results with limited IT support (Alpar & Schulz, 2016). Therefore, BI success

depends on the users' perceived benefits of the SSBI result and the satisfaction with the use and performance of the SSBI tool (Yeoh & Koronios, 2010).

The users' perceptions can result from performing various analytical tasks that lead to the technology's adoption or resistance. It is also impacted by user uncertainty that occurs with behavior from social interactions, emotional reactions, and personal traits (Weiler, Marheinecke et al., 2019). Casual users' perceptions of ease of use and usefulness can influence the SSBI use (Blut et al., 2016). When casual users perceive high quality, they also see a positive influence of usefulness in the SSBI, while the experience had less effect on the expected contribution of the SSBI (Passlick et al., 2020). Their perceptions of SSBI are impacted by how well they understand the work routine changes, fear about artificial intelligence, or concerns about their power position when data access and use changes (Popovič, 2017).

In a mixed-methods study, Rahman (2020) investigated the technological capability factors influencing big data acceptance and found the scalability of data storage, processing, output quality, usability, reliability, training, and required skills, and perceived ease of use is positively related to perceived usefulness that leads to behavioral intention to use and actual use of Hadoop. Casual users interact with BI tools and use data that they believe support their tasks and improve their work performance if they have the skills to use the system. During SSBI development and implementation, IT managers can gather information from casual users' experiences and beliefs about the reasons for their workflow to develop appropriate training, align business processes with technology and build easy to use BI tool with useful results (Lennerholt et al., 2020).

The critical factors are requirements for SSBI success; without them, it leads to failure (Yeoh & Koronios, 2010). The people, politics, and policies are critical sources, and the relationships between the business and IT groups, roles and responsibilities, IT management, and training are essential to the BI success (Bele, 2019). Villamarín-García (2020) suggested that the CSFs for implementation also influence collaboration for data-driven organizations (user participation, leadership roles, trust, team composition, and personal learning). Human resources and their culture are critical factors that lead to participation, workflows, social dynamics, and experiences become important components and mechanisms for SSBI success. The transformation of an organization involves the development of a collaborative vision to overcome user resistance by establishing groups of key influencers that discuss their views of shifting from the current business processes to future endeavors (Eden et al., 2019).

Within an organization, the users' perceptions of change and user resistance influence their readiness to accept technology and the organization's ability to remain competitive (Dunican & Keaster, 2015). In a case, the study of an SSBI pilot project, Rinkenberger (2020), suggested that willingness and acceptance of SSBI exist for employees, but there is a lack of cultural readiness and technical skill to understand and put into practice the effort of preserving and processing data. Casual users need to understand how SSBI integrates with the work routine (Berndtsson et al., 2019). Users accept BI when they understand how the SSBI aligns with their work routine. In collectivist cultures, individuals avoid uncertainty, a prior understanding of the technical process reassures users of the workflow (Vargas & Comuzzi, 2020). Prior knowledge can

help users prepare for change; however, the perception of readiness has mixed results regarding the influence of adoption. Blut et al. (2016) reported that readiness is a useful predictor of self-service technology adoption. However, Puklavec et al. (2108) suggested that organizational readiness does not influence the use stage of BI adoption but occurs as a significant factor in the evaluation and adoption stages.

Direct and indirect change occur with overlapping roles among individuals; each individual has a different capacity for adapting better to change than others, which serves as critical factors affecting teams (Daghfous & Ahmad, 2015). Their behavior can be a reaction to emotion, social norms, personal preferences that result from different personal experiences or backgrounds (Weiler, Marheinecke et al., 2019). Often, casual users fear losing power over information activities, modifying job skills, and changing their decision-making approach (Popovič, 2017). Social dynamics relate to the complexities of human nature and their reactions to changes in their environment and each other. Lerner et al. (2015) suggested that individuals who fear a loss of control tend to appraise a situation with an increase in anticipated effort and a higher level of uncertainty to complete a task than those with a positive reaction. IT managers can reduce user uncertainty with change management to increase the familiarity of the technology and work routines to gain the users' trust and improve the users' understanding of the changes; therefore, it increases SSBI adoption and reduces user resistance (Weiler, Matt et al., 2019).

From an intra-organizational level, individuals' trust leads to involvement and engagement in BI solutions development, stimulating autonomous learning to build a

better understanding of the casual user role (Villamarín-García, 2020). Training increases the users' trust by increasing their understanding of technology (Weiler, Marheinecke et al., 2019). With training, users become involved with the changes to their tasks and work routine, learn how to develop new skills, and develop trust in the BI or organization's outcomes. The system environment is also a guide for the user to assist them in their workflow, which builds user trust by increasing user confidence (Morana et al., 2017). The individuals' trust in a system occurs when their confidence level is higher than the perceived risk (Fan et al., 2018).

Moges et al. (2016) suggested that user confidence is dependent on the education level, decision strategy, and a clear understanding of the decision task. With technology support, users can develop confidence with their tasks by developing trust in the SSBI tools. Training is a way for users to understand their role and become familiar with the SSBI to complete tasks. With the SSBI use, the BI features and data quality can support decision accuracy, and the casual user can trust their decisions. From the technology perspective, users perceive trust in the support from SSBI and the quality of data, and they are willing to make decisions from the results (Bani-Hani, Tona et al., 2018).

SSBI succuss is improved when casual users acquire the skills to explore the right data that leads to high-quality decisions with the appropriate data governance for user innovation (Aminy et al., 2019). Data governance is required for data quality, yet it can reduce the casual user's motivation to use the SSBI tool. Casual users often find it difficult to access and use SSBI to interpret data and make decisions (Lennerholt et al., 2020). As a result, their decision is often a challenge with incomplete or incorrect data

(Berndtsson et al., 2019). In a qualitative study using grounded theory, Clarke et al. (2016) explored self-service analytics and data governance with data consumers, those individuals who use the data and define the fit for purpose. They developed the self-service analytics framework's governance for a common understanding between the user and the developer to define requirements in analytical projects. Compatibility between governance and users is a critical factor; training users to gain analytic skills is an important process to ensure users know how to use the SSBI and gather the appropriate data for making the correct decisions.

A CSF for success is the users' participation and involvement within a team (Aminy et al., 2019). Self-reliance and empowerment's user capacity increases confidence to become involved and interact with SSBI solutions (Villamarín-García, 2020). In SSBI environments, independence and self-efficacy are the motivation that drives casual users to explore and exploit the availability of data sources (Bani-Hani, Tona et al., 2018). Individuals adopt SSBI when they perceive that they can control and direct the outcome, which increases confidence (Blut et al., 2016).

With competencies and self-reliance, users become more confident to develop analytical skills as they participate and become more involved in teams. Often, overconfidence occurs with difficult decisions when the decision-maker estimates the probability of being correct, and their confidence can make an individual feel more likely to be correct on a decision (Mamassian, 2016). Confidence is a motivator to become more self-efficient in using SSBI to make decisions and involve teams, and positive or negative outcomes can occur. With the involvement and participation in teams, users can

share information and solve problems before making choices. A critical factor in the post-implementation stage is the social dynamics between individuals to gain knowledge from team members.

Often, casual users can increase their skills, leading to changes in their access and role (Aminy et al., 2019; Yeoh & Koronios, 2010). Their motivation is an essential factor in BI use and its success (Chang et al., 2015). Blut et al. (2016) investigated the efficiency and effectiveness of service delivery from different technology theories, reporting that IT managers should target casual users motivated to the BI solution. Based on the expectancy theory and social exchange theory, Chang et al. (2015) suggested that good decision making with the BI use is effective when managers are motivated to read BI results. Motivation to use BI for casual users can increase when the system's task complexity is reduced (Chang et al., 2015). Individuals' motivation can increase the SSBI use by their desire to become involved with the SSBI initiative and their interest in gaining information from the SSBI. Tasks can overwhelm casual users until they see the benefit of the BI systems that provide a means to decrease workloads, reduce administrative burdens, and simplify the workflow.

With the guidance of the SSBI, casual users provide a level of task motivation and need the ability to control the system (Chan et al., 2017). User motivation can influence the intention to use a system based on how they perceive a task and their control level. Casual users share information with other users if they desire to understand the BI results' output. The appropriate data access, system control, and training can ensure that casual users have the right motivation to increase their skills and maintain their responsibilities

in their role. A team's skills determine the level of BI access and use, and training that improves the BI success and the users' ability to adapt to their role (Aminy et al., 2019). A critical factor is the casual users' personal motivation to gain the appropriate skills to use the system through training and sustain their responsibilities in their role. As a team member, individuals want to share information and understand the data and BI results.

With analytical coproduction, SSBI decreases the casual users' level of engagement. IT support when solving problems to gain more responsibility, increase flexibility, enhance efficiencies, ensure data quality, and reduce cost. However, the benefits can be negated with advanced analytical tasks that are too complex (Bani-Hani, Tona et al., 2018). Casual users can become self-sufficient in their efforts to create analytical reports, which reduces their interactions with IT support. As a critical factor for success, training is an approach to develop the skills and knowledge of casual users about the types of decisions to make when using the SSBI, obtaining the right amount of information, and determining the level of data quality (Berndtsson et al., 2020). The content experts of teams collaborate and develop BI features and functionality to improve user adoption (Daghfous & Ahmad, 2015). They develop training material for general users and assess risks and opportunities for BI development and implementation (Berndtsson et al., 2019).

Individuals adapt to their roles through training by acquiring knowledge about system capabilities and information sharing from colleagues. Casual users who developed an in-depth knowledge of the BI tool and perceived advancements in their competencies were able to transform their role, maintain their engagement, and change their

organization's values for continuous improvements (Eden et al., 2019). Training is a transfer of knowledge about the organization and technology domain throughout the adoption process (Bani-Hani, Pareigis et al., 2018). Extrinsic benefits (e.g., gain organizational rewards, earn a better reputation, or receive reciprocity) can improve the casual users' desire to exchange reports with other colleagues related to decision tasks (Chang et al., 2015). A collaborative BI environment and social networking improve decision making and consumption of BI results (Imhoff & White, 2011). As a critical factor, advantages and education provide casual users with reasons to collaborate and enhance their capabilities.

IT Management Support for Casual Users

IT managers leverage technology to reduce IT cost by deploying SSBI and enabling casual users to use and access data for analytical tasks (Lennerholt & van Laere, 2019). The technology advancements, increases in data consumption, and introduction of Big Data have impacted IT management to develop BI systems that extend casual users' decision-making capabilities and discover new knowledge (Ain et al., 2019; Mortenson et al., 2015). IT managers need to consider critical factors during the development and deployment of SSBI and the underlying technology to support casual users in decision-making. The challenges exist with developing BI solutions that support a wide variety of users with various tasks and different levels of skills (Baier et al., 2020).

To increase productivity, IT managers design SSBI to generate a data workflow for casual users to complete analytical activities, which increases their control of information and reduces IT support (Alpar & Schulz, 2016). In a comparative analysis

with undergrad students enrolled in IT school, Town and Thabtah (2019) found Tableau ranked higher than Power BI from a user's point a view for effective data analysis and reporting, presents in the market, and available training, except Power BI, ranked slightly higher for interface ease of use. It is an exploratory study, and the needs of casual users can differ in various organizations. The organization strategies and business processes are other factors for IT managers to consider for SSBI initiatives. In terms of learnability, the casual users' reaction to the dimension views of data and usability leads to the appropriate use of the interface, but it does not suggest a suitable data model (Vujošević et al., 2019) .

Individuals who identify themselves as casual users can possess different skills, interests, social norms, and perceptions that influence their attitude towards the use of SSBI (Blut et al., 2016). IT managers are responsible for creating the responsibilities and the functions of the power users and casual users (Aminy et al., 2019). They need to create a team composition with a balance to support teamwork and enable individual participation (Villamarín-García, 2020). In maintaining team morale, IT managers must identify challenges for avoiding conflict and respond to conflict within the organization levels or outside the governance structure that distracts casual users from developing analytical competencies (Eden et al., 2019). Preserving a productive team is a challenge when managing the group's functions and the internal and external social dynamics that can reduce performance. The team members have different needs concerning business analytics and demands on the SSBI tool (Rinkenberger, 2020). IT managers manage the complex social issues between the users by coordinating efforts to encourage open

communication, listening during team meetings to promote innovation, and addressing challenges (Hogan et al., 2018).

IT managers are responsible for transforming a workforce that occurs with recruitment or replacement of individuals or the training and development of staff (Eden et al., 2019). They create a vision and support for a data-driven culture that empowers casual users to develop analytical skills for interpreting data that lead to decisions (Berndtsson et al., 2020). The vision and management support helps users anticipate adjustments to their roles and responsibilities and SSBI use. Team changes and education can help casual users adjust their responsibilities and tasks to align with organizational goals (Laumer, Maier, Echardt et al., 2016).

With training, IT managers can support casual users by informing them of workflow changes and increasing their understanding of the SSBI tool and familiarity with the SSBI tool (Berndtsson et al., 2020). Management support can promote organizational culture improvements for obtaining values to overcome stress, cope with fatigue, and manage responses to unanticipated events (Eden et al., 2019). Cultural enhancements occur with casual users' awareness of their responsibilities and increased skills to use technology for daily tasks. With the collaboration of a team, casual users learn how to manage unpleasant situations. Throughout the SSBI maturity, culture is characterized by data; therefore, data governance is a guide for users to understand the concepts of data and policies for user access, data quality for reports and information sharing, and security management (Aminy et al., 2019).

IT management can support casual users by developing key performance indicators that ensure SSBI improves performance (Berndtsson et al., 2020). Eden et al. (2019) suggested that evidence of learning for experience and the on-going competencies allows users to reflect upon their tasks, which helps transform teams and link the activities to norms, ethics, and identity of the culture. Villamarín-García (2020) recommended other metrics are a list of tasks or procedures related to achievements (e.g., system use perceived system usefulness, adoption, user satisfaction, system quality, performance quality, and information quality). IT managers can use metrics to guide their team to reach goals, stay on schedule, and provide evidence to show performance. These metrics are aligned with organizational goals and improve or optimize organizational performance (Bele, 2019).

Management support is a critical contributing factor for communicating the organization's vision and emphasizing the importance of adopting BI to increase casual users' commitment (Puklavec et al., 2018). With the use of communication strategies, IT management can inform all casual users of workflow or work routine changes to reduce user resistance and increase SSBI adoption (Laumer, Maier, Echardt et al., 2016). Communication is an important collaboration tool for management to support users and inform them of the organizational vision and workflow changes for change management. The use of change management is an approach to transform the current organizational environment and support a data-driven culture for educating users depending upon their technical background (Berndtsson et al., 2020).

Management support is required for the effective deployment of BI solutions, and the awareness of customers' risk perceptions, casual users' fear of uncertainty to avoid embarrassment (Blut et al., 2016). With an awareness of the casual user's perceptions and behavior, IT managers must carefully consider the SSBI process's transparency and tasks process to reduce user uncertainty (Weiler, Matt et al., 2019). Nevertheless, organizational transparency is an approach for a data-driven culture to encourage understanding between teams for promoting consistency and data quality (Aminy et al., 2019). IT managers assess the risks of uncertainty and transparency by gaining information from all levels of an organization to anticipate a successful SSBI solution. A balance is required between the users' understanding of the SSBI system to achieve their tasks and organizational sustainability (Aminy et al., 2019).

IT managers need to consider the strategies and data governance for training and support for casual users to maintain data consistency, data quality, and appropriate user access (Berndtsson et al., 2019, 2020). Perceived ease of use BI tools and easy to consume BI results are essential for adopting technology, and it requires a better understanding of the casual users and their culture to determine the infrastructure design and development (Blut et al., 2016). With user participation, IT managers can learn about the casual users' perspective and experiences about flexible SSBI tools and proper data governance. Empowering the casual user, IT managers align the casual users' skills and tasks with the easy to use SSBI and promote user interaction for better decision making (Imhoff & White, 2011).

Casual User Training in Strategic Organizational Planning

IT managers have planned, designed, and implemented SSBI without addressing the needs and requirements of casual users to interact effectively with the technology (Weiler, Matt et al., 2019). Imhoff and White (2011) suggested that casual user skills, governance, and the lack of training are critical factors contributing to the SSBI failures. As a revitalizing activity, training ensures that the necessary roles and processes are in place to support the changes; users can effectively perform their tasks and use the system (Eden et al., 2019). The training is a balance between developing the skills of casual users and the operational functionality of the SSBI to deliver data for analytical tasks. Through training, casual users can obtain analytical skills in data literacy, data preparation, and data quality and establish a data-driven organization (Bani-Hani et al., 2019).

With workforce transformations, an organizational strategy is a goal-driven approach to facilitate how individuals perform their tasks and support them in reflecting and recommitting their role in the organization (Eden et al., 2019). As organizations develop their strategic plan, IT managers need to consider their culture, training, and education are more critical in organizational cultures with equality and strong relationships among peers that avoid uncertainty than hierarchical organizational structures with weak connections among members (Vargas & Comuzzi, 2020). A strategy reflects the management's culture to evaluate the organizational structure, assess methods to overcome obstacles, and develop strategies to achieve goals. During the planning stages, they must consider the training involved with the transition of roles and responsibilities between the casual users and power users, privacy policies, and data

security (Imhoff & White, 2011). IT managers can prepare for possible extraneous events that affect normal operational, disrupt the organizational structure, and casual users are faced with wellness issues of stress, anxiety influencing their abilities to perform existing tasks (Hartmann & Lussier, 2020).

For the BI project, the strategic vision and the business case are aligned with the initiative to meet the organizational objectives and needs (Yeoh & Koronios, 2010). Imhoff and White (2011) proposed establishing governance committees to determine if an existing component of the SSBI can fulfill a request or if a new one is needed, examine requests for user access, approve enhancements for SSBI, and identify training needs. Casual users are guided by governance to provide them with information on data access, data quality, and data standardization. In the organization, IT managers are responsible for the SSBI vision and training strategy to enable casual users to increase their competencies (Berndtsson et al., 2019).

Casual users require training to inform them of how they can accomplish tasks and the availability of tools, but it is the vision that provides them with the reason they are accomplishing the tasks. It is important to communicate and train users on how the SSBI can meet their needs (Passlick et al., 2020). With education, users gain knowledge about how to use the SSBI to achieve the organizational goal. Training for casual users is focused on describing a basic understanding of the SSBI, and the nontechnical aspects, such as the meaning of the data elements, generating useful reports for decision making, sharing information, and governance (Berndtsson et al., 2020).

BI Skills Needed For Casual Users

In the SSBI environment, most users are identified with a casual user's role and responsibilities (Baier et al., 2020). They accomplish tasks with a need to control and access data to analyze and interpret information to make decisions (Alpar & Schulz, 2016). With access to data, the casual user's role is defined by their power position for the right to use information. Focusing on the SSBI environment, Imhoff and White (2011) presented a set of tasks that described the supply of data for casual and power users to emphasis the easy to use BI tool and easy to consume BI results.

The empowerment of the casual users requires a certain level of knowledge, business understanding, experience, and competencies to use the BI tool during different analytic processes to complete tasks (Bani-Hani et al., 2019). It requires the user to have easy access and meaningful data to understand the data sources for analysis (Imhoff & White, 2011). The casual users' satisfaction with the high contextual and representational informational quality is important because it reduces the workarounds in aligning the system with their work routine (Laumer et al., 2017). The self reliance of a casual user is dependent on their ability to understand the data meaning and relationships to generate useful analytics. Casual users become co-creators in a BI activity that requires knowledge and experience of the processes of data gathering, data preparation, data analysis, and visualization (Bani-Hani et al., 2019). According to Alpar and Schulz (2016), casual users can perform their BI needs with the right skills and access without power users' involvement.

Casual users access data by integrating data sources from the data warehouses and managing data quality with governance rules (Imhoff & White, 2011). The goal of governance is to create a single version of the truth by addressing the data quality and consistency issues and enabling the casual users to gain new insight from ad-hoc reports (Aminy et al., 2019). Governance is a way to organize the chaos of information input from merging multiple data sources with various qualities and the information output from generating reports and models for analytical to make decisions. With the oversite governance, casual users prepare data for analysis by integrating data sources, detecting outliers, correcting missing data values, and calculating data (Bani-Hani et al., 2019). The data analysis is an iterative process for casual users to explore and exploit data using dashboards, visualizations, and reports (Imhoff & White, 2011). Business analytics requires a description of the median, filtering, percentages, and advanced statistic analysis of variance and regression testing (Bani-Hani et al., 2019). After the analysis, casual users can share related information with other users to optimize business operations and make decisions (Imhoff & White, 2011). Several steps are required to gather data for analytics with business and technical skills. The dissemination of information occurs when casual users are able to interpret reports effectively with limited IT support, and they are confident, trust the data, acquire a certain level of technical skills, and obtain organizational support (Bani-Hani et al., 2019).

IT Managers' Knowledge Gaps of Casual Users' Implementation Challenges in the Post-Implementation Stage

IT managers need to know how to achieve data-driven cultures and develop corporate strategies for overcoming user resistance and their difficulties with access to relevant information from vast amounts of data (Berndtsson et al., 2020). Often, IT managers require a better understanding of the casual users' level of knowledge and experience of the casual users and power users and the work routines and analytical tasks associated with the SSBI (Bele, 2019). The SSBI success is dependent on the casual users' motivation, social norms, attitudes, emotions, and perceptions of the technology that lead to their motivation for SSBI use (Blut et al., 2016). User adoption of SSBI is related to the users' tasks and workflow and their psychological and sociological nature. The CSFs of SSBI success is impacted by the users' perceptions and experiences that influence the SSBI use. Updated empirical research is needed based on BI experts' guidance on which CSFs may enable casual users to fulfill their SSBI needs in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020).

Data Sources Easy To Access And Use

Casual users have difficulties with easy access to exploring various data sources and efficiently developing reports with limited IT support (Lennerholt et al., 2018). With minimum effort, casual users need access to data to create various combinations of reports for making decisions in an organizational environment that is continually changing (Imhoff & White, 2011). Casual users may become uncertain of their SSBI environment because they lack the knowledge to use the SSBI system properly or

analytical skills (Weiler, Matt et al., 2019). Uncertainty can reduce SSBI adoption, causing user resistance when users cannot perform their work routines, and they perceive the technology as difficult to use and useless (Laumer, Maier, Echardt et al., 2016).

Complex technology can lead to employees' job characteristics, requiring more training and skills for individuals (Rahman, 2020). From a lack of knowledge, uncertainty leads to poor job performance and decreases the SSBI use. The BI adoption, use, and success studies have increased in the past 10 years with 56% of 111 studies applying qualitative research; Ain et al. (2019) reported that future research is needed about user competencies, such as IT-related skills, IT knowledge, utilization ability, or any other individual characteristics relating to reporting and analytics for casual users. Lennerholt et al. (2020) recommended further investigation on how to manage casual user data access and use challenges to increase adoption, understanding the challenges related to novice and experienced users, and the progression of challenges throughout the maturity of the SSBI.

Data Selection Criteria

Casual users confront challenges of extracting relevant information by the data definitions, the strength of the association between data sources, and the timeliness, completeness, and accuracy of the information (Lennerholt et al., 2018). Data integration and interoperability require a user with some technical skills and an easy to use BI tool (Antunes et al., 2016). In the SSBI environment, casual users lack knowledge about the data terms, data linkage associations, and database structures, which increases their frustration and confusion to perform analytical tasks and reduces their ability to organize

data in meaningful reports (Schlesinger & Rahman, 2016). Vujošević et al. (2019) suggested that the dimensional view of data should be the first view a casual user observes when learning how to make ad hoc queries better to understand data tables' concept joints filtering.

To select data, casual users need to acquire specialized skills to collect and analyze data to understand the data elements and their relationships. The reasons for the user's uncertainty are the lack of standardized training programs, the limited knowledge of casual users, and the improper use of the SSBI system (Weiler, Matt et al., 2019). In contrast, Yeoh and Popovič (2016) suggested that maintaining ongoing support upon request can better assist casual users in understanding the analytical tasks, then rigorous training to improve BI adoption. Casual users learn how to develop skills from various sources; each user can have a different learning style, but the education needs to align with the organizational goals. Izhar et al. (2017) recognized the relationship between the organizational linked data task and the achievement of the strategic goals, recommending further research on a better understanding of the integration process to make decisions and exploring the system used for organizational purposes.

Correct Data Queries

Casual users must understand the semantic layer's meaning to link data correctly for analysis and make accurate decisions (Lennerholt et al., 2018). To avoid uncertainty, casual users try to make rational judgments by gathering information based on personal preference to maintain control, which leads to misinformed decisions (Weiler, Marheinecke et al., 2019). Another reason for the casual user's uncertainty is the lack of

understanding of the SSBI importance and how it affects their work routine (Laumer, Maier, Echardt et al., 2016). Each user can develop a different understanding of the data depending on their subjective perceptions, uncertainties concerning their role, and knowledge of the SSBI. The challenge is establishing proper education for informing employees of benefits and system functionality (Lennerholt et al., 2020).

Data Integrity, Security, and Distribution Control

Without proper internal controls, management problems occur for data storage, integration, quality requirements, and security (Lennerholt et al., 2018). It is difficult to adjust the technology management and controls with the rapid shifts in the economic market. In an approach to decentralize data, IT managers are responsible for managing the business–IT alignment to ensure data quality and the appropriate access for SSBI users (Aminy et al., 2019). Data protection can be difficult with the data consumers' governance for data access and data errors, and self-service analytics to import data and create data visualizations (Clarke et al., 2016). It is an on-going commitment of upper management to safeguard data integrity and privacy and enable casual users to improve their decision-making capacities. Without data integrity and control, casual users analyze data in different teams leading to unexplainable errors and faulty interaction processes (Weiler, Marheinecke et al., 2019).

Data Management and Data Governance Policies

Governance is created to define data availability, quality standards, and analysis to avoid a shadow IT system where users are misinformed about the available data regarding access and analysis to create one version of the truth (Lennerholt et al., 2018).

Nevertheless, the perfect version of data quality and consistencies is challenging to obtain for organizations and casual users (Daradkeh, 2019). Also, SSBI initiatives can fail because the internal controls of governances and processes are not clearly defined to validate the data, which results in inaccuracies and negatively impact decision making (Burke et al., 2016). With governance, users can make better decisions by gaining knowledge about data quality and the available data source for analysis. The challenge is creating realistic and reasonable governance that supports the casual user to use the SSBI and promotes trust in the data quality. Passlick et al. (2020) suggested that the SSBI intent to use decreases when casual users perceive an exhaustive data quality governance and proposed that data quality inputs are centralized and the results are decentralized.

The first challenge is for IT managers to establish data governance that ensures business–IT alignment to achieve high data quality and consistency without restricting the user's freedom and innovation (Aminy et al., 2019). The second reason for challenges with data management is user resistance caused by shifts in the roles and responsibilities, changes in their job skills, decision-making strategies, and a loss of data access that reduces their power position (Popovič, 2017). The third reason is the lack of leadership to create a vision and develop an adequate training plan (Berndtsson et al., 2019). The fourth reason is that the IT managers need to create a change management plan and communication strategy to inform all users of the implementation and changes to work routines to reduce user resistance (Laumer, Maier, Echardt et al., 2016). However, Yeoh and Popovič (2016) suggested that user-oriented change management was not needed to inform the knowledgeable, casual users because their involvement and user participation

throughout the implementation process provided the support to meet their needs. The fifth reason is a lack of understanding of the cultural dimensions of the size, economic status, social norms, and the corporate sector and type (Vargas & Comuzzi, 2020).

The casual users perceive the SSBI as artificial intelligence, and they fear losing their job or responsibilities (Weiler, Matt et al., 2019). Artificial intelligence assumes more complex tasks that require cognitive capabilities without human control (Duan et al., 2019). As technology advances, casual users are increasing their interactions with artificial intelligence. The future state of analytical workflow includes automation as an augmented analysis for decision-making, eliminating power users' role to integrate data sources (Abas et al., 2020). Nevertheless, Antunes et al. (2016) reported that creating real semantic decision-making environments allows users to create queries without artificial intelligence.

With data management and SSBI environments, decision-making is a process to create meaning and relationships from data elements and sources; the data management approach is a paradigm between technology efficiencies and the humanistic tactic of knowledge. The data management with artificial intelligence continues to develop with SSBI implementations. Duan et al. (2019) suggested that understanding the critical factors related to artificial intelligence and vast amounts of data can help designers build better solutions. With a focus on casual users, Weiler, Matt et al. (2019) recommended further studies to focus on the role of emotion related to technology IT use by describing their subjective experiences.

Visual Analytics Preparations

Data visualization is an approach to communicate information about relationships, patterns, and casualty among data (Bele, 2019). In SSBI environments, IT managers are challenged to manage users with different skill sets and achieve a fit between their skills and SSBI task (Alpar & Schulz, 2016). The challenge is to develop data visualizations that align with the various abilities and SSBI tasks of casual users. Bani-Hani et al. (2019) suggested that organizations strive to gain technical, analytical, and visualization skills for casual users, yet they often lack self-confidence and trust in data. Other individuals may generate a presentation of the information and not understand the data (Burke et al., 2016).

Casual users experience problems in the use of BI visualization tools to discover and share insight and often require IT support (Lennerholt et al., 2018). In an extension of visual analytics adoption of the innovative, organizational, and environmental characteristics, Daradkeh (2019) proposed that the discovery and exploration of data context and ease of use and learning of the BI tool influence the adoption of visual analytics. The use of SSBI supports the users in making decisions if they have the appropriate skills, data access, and data use. Using cognitive fit, Engin and Vetschera (2017) reported that users take additional steps to solve problems when mismatches of the task and visualization occur, proposing that errors happen in the information acquisition than in the actual problem-solving stage.

The challenge is creating visualization tools for casual users with different cognitive styles to support their analytical tasks and abilities to make decisions. When

presenting information, highly analytical decision-makers viewing data in a tabular format leads to the best results but more errors with intuitive decision-makers (Engin & Vetschera, 2017). Casual users gather and interpret information with different cognitive styles that influence how they use the SSBI and their decisions. Mortenson et al. (2015) proposed further evaluation of best practices in data visualization on decision making to expand knowledge for practitioners and researchers. Bani-Hani et al. (2018) suggested case studies to explore the practices and development of an SSBI approach by identifying the main actors that operate the process and the processes and mechanisms of users to solve analytical tasks.

Summary and Conclusions

In this chapter, a literature review and critical analysis were conducted about scholarly research on SSBI and IT management's main concepts. It included the knowledge gap in the CSFs that may limit the success of SSBI initiatives for casual users in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020). Previous scholars suggested that IT management’s challenges for SSBI success confront organizations concerning the support of the self-reliant casual users for sustainability and competitive advantages in a global economy (Hartmann & Lussier, 2020; Lennerholt et al., 2018). For the literature search strategy, key search terms were identified, and the databases and journals that were used for the literature review. To align the study’s purpose, this chapter included two key conceptual models for the conceptual framework.

Empirical research on the CSFs for casual users needs to adopt SSBI initiatives that allow for effective collaboration of IT management and data-driven culture in

organizations. Among IT managers, significant challenges remain for casual users to actively engage in analytical tasks to make decisions, thereby gaining analytical competencies and becoming self-sufficient that improve their productivity for organizational sustainability and competitive advantages (Lennerholt et al., 2018). Another challenge is the SSBI management that involves the CSFs to develop a vision which aligns the organizational processes with analytical requirements and encourages the adoption of a data-driven culture that empowers casual users to develop analytical skills for interpreting data that lead to decisions (Berndtsson et al., 2019; Villamarín-García, 2020). Without proper administration, IT managers fail to manage the perceptions and sources of uncertainty for casual users regarding the SSBI process and task and the teams' social structure (Weiler, Matt et al., 2019). An in-depth understanding is needed describing BI experts' guidance for IT managers on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020).

Chapter 3 is dedicated to the methodology and discusses the research method for qualitative, descriptive multiple-case study research. The chapter will include the research design and rationale, the researcher's role, the methodology for recruitment, and participation and data collection. As part of Chapter 3, the data analysis will address issues of trustworthiness and ethical procedures.

Chapter 3: Research Method

The purpose of this qualitative, multicase study was to describe BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. To meet the purpose of this subject-matter-experts study and remain consistent with the qualitative paradigm, a multicase study design (Yin, 2017) was used to collect data from a purposeful sample of BI experts. Both scholarly and practitioner-oriented literature document the fact that many IT managers struggle to use the potential of SSBI and managers note significant challenges with casual-user-related SSBI implementation (Baier et al., 2020; Lennerholt et al., 2020). My goal for the study was to gain a more in-depth understanding of BI experts' guidance for IT managers on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020).

This study may be significant to professional practice by informing IT managers on how to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality so they can complete their assigned IS-related tasks successfully (Berndtsson et al., 2019). I sought to develop a research design that would extend theory and academic knowledge to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) through the views of subject-matter-experts. The open nature of expert interviews may yield data from experts' breadth of knowledge and experience in research fields that needed exploring (Littig & Pöchhacker, 2014).

Chapter 3 provides detailed information on the research method and rationale for conducting an exploratory multicase study and the research question guiding this empirical investigation. This chapter presents a foundational rationale for the participant selection strategy, data collection strategies, data analysis; it also presents the researcher's role, ethical considerations, and a summary of the research method's main points.

Research Design and Rationale

Browne and Keeley (2014) recommended that a researcher ask the right questions in qualitative research to address the study's purpose and drive the research strategy. Consistent with the purpose of this study, the research question was as follows: How do BI experts describe their views on the CSFs needed for self-service BI initiatives among casual users in the post-implementation stage? SSBI is an emerging trend that allows nontechnical, staff casual users to efficiently and effectively use BI in a self-reliant manner without needing the support of their IT managers (Aminy et al., 2019; Lennerholt & van Laere, 2019). Both scholarly and practitioner-oriented literature document that many IT managers struggle to use the potential of SSBI and managers note significant challenges with casual-user-related SSBI implementation. IT managers need to understand the impact of CSFs on the organization's contexts, technology, and process for successful deployments of SSBI (Villamarín-García, 2020; Weiler, Marheinecke et al., 2019; Yeoh & Popovič, 2016).

In previous SSBI studies, the literature is focused on practitioner research for enhancing practices and addressing the problem. A knowledge gap exists for a better understanding of the guidance from BI experts about the CSFs that increase the

successful SSBI adoption among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). The current post-COVID-19 environment has created uncertainty with business processes and a growing need for analytical skills, but SSBI adoption challenges with casual users undermine the strategy to maintain a competitive advantage that promotes long-term sustainability (Bansai & Kumar, 2020; Jacquin et al., 2020).

This qualitative study's nature was derived from an interpretivist paradigm that assumes that individuals and groups create their social realities to address the study's purpose and obtain a data collection for the research question (Cooper & White, 2012). Another assumption of interpretivists is that the interpretations of a social phenomenon are meaningful connections from individuals' perspectives based on their biographical, organizational, and social contexts (Tracy, 2019). For this study, an exploratory case study was used as the research design to address the study's purpose for a greater understanding of BI experts' views on the CSFs needed for SSBI initiatives among casual users post-implementation stage (Yin, 2017). Expert interviews are now frequently considered a standard qualitative research method (Bogner et al., 2018). The qualitative research design is an approach to analyzing business decisions and exploring motivations behind social behavior's various aspects. With qualitative sampling strategies, purposeful sampling is used to ensure an in-depth understanding of the case studies (Robinson, 2014).

Other qualitative designs were evaluated (e.g., phenomenology and narrative inquiry) and considered ineffective in answering the research question due to uncritical

personal storytelling's methodological limitations during selecting the case study research design (Ritchie et al., 2013). With a recommendation from Yin (2017), the case study design is an approach to describe the phenomenon or explain the reasons for the phenomenon to occur. An exploratory multicase study (Yin, 2017) was used to meet the study's purpose to better understand BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.

For this study, the multicase study was select rather than other research strategies (e.g., narrative, phenomenology, and ethnographic designs). The multicase study is focused on the present phenomena within real-world settings beyond the unit of analysis rather than other designs with a direct emphasis on the study (Eisenhardt et al., 2016). Concerning ethnographic and narrative design, the data collection is focused on narrative storytelling and, in phenomenology, it is aimed at capturing the meaning of experience (Merriam & Tisdell, 2015). The design of a multicase study is described by a comprehensive, holistic, within-case, and cross-case analysis for building a broad experience that makes it the best approach for this study (Merriam & Tisdell, 2015; Yin, 2017).

A multicase study can involve individuals within a social context of the phenomenon as separate units of study (Stake, 2006; Yin, 2017). Compared to other research designs, multicase studies are different from surveys and experiments exploring management behaviors across different contexts in a global economy (Halkias & Neubert, 2020). Surveys are developed to answer a particular research problem by collecting data from a random sample of individuals, and experiments are created to

control variables for testing hypotheses (Yin, 2017). The design of multicase studies includes the use of replication of different cases to collect data. In a multicase study, a cross-case analysis begins by synthesizing details for a general explanation of the phenomenon after the data collections from all cases are compared for similarities and differences (Eisenhardt & Graebner, 2007; Yin, 2017).

The multicase study and the cases' selection were categorized into two types of selection to address this study's problem, namely the *literal replication* and the *theoretical replication*. The multicase study design is selected to bring forth convergent and divergent results across cases. In a multicase study, the case itself may be a person, an event, an entity, or other units of analysis (Halkias & Neubert, 2020). Taking the example of a case as a person, a single case concerns one individual, whereas a multicase study involves more than one person. The purpose of this process is to replicate the same results across multiple cases by exploring the differences and similarities between and within cases (Yin, 2017). Study results emerging from the cross-case analysis and the replication process are considered robust and reliable and can be used to extend theory from cases within the management domain (Halkias & Neubert, 2020; Welch et al., 2020; Yin, 2017).

Role of the Researcher

The strategy to mitigate researcher bias is the research's reflexivity process, organization of the interviews, and type of interview questions. As a researcher, my role is the primary instrument to maintain a code of ethics and manage bias through reflexivity for collecting and analyzing data in qualitative studies (Merriam & Tisdell,

2015). Throughout the entire research process, I sought to remain objective while collecting, maintaining, and analyzing data and providing feedback to safeguard against undue bias. Critical to my role, I listened actively to participants and offered opportunities for feedback through the semistructured interview process to create a detailed audit trail throughout the study (Mann, 2016). During the study, reflexivity was essential for promoting my awareness of assumptions and managing their effects, providing audit trails to support participants' perspectives (Merriam & Tisdell, 2015).

To mitigate personal bias, I gathered the resources for the literature review from different databases with different sets of relevant keywords to offer various perspectives on the topic (Dowd & Johnson, 2020). In the study, I gave clear instructions with careful intentions not to ask questions or provide explanations to the participants regarding the research problem and topic that led to bias responses. During the interview, I asked questions to follow up on responses for clarification or exploration of answers. I built a rapport with interviewees, as well as reflected upon my conduct and my interactions with the participant before, during, and after the interviews. Adhering to the code of ethics, the anonymity of participants and data confidentiality was respected at all times. As part of the ethical considerations and trustworthiness, individuals accepted the terms of the informed consent before participating in the study. The study participants and the researcher maintained equal power relationships without a social-formative supervisory role (Kee & Schrock, 2020).

Methodology

A multicase study is designed for a researcher to investigate a social phenomenon by comparing and contrasting differences of the experiences between cases, relating to each participant as a separate entity (Yin, 2017). With qualitative research, researchers can describe and discover complex concepts and relationships, as well as understand the processes and patterns for organizational or individual behavior (Tsang, 2013). For this study, the cases were analyzed using replication logic to compare the data, with each case as a separate entity, and the potential for future evaluations of theoretical constructs (Eisenhardt & Graebner, 2007; Gehman et al., 2018). As part of the qualitative method, the probing questions contribute to the originality of an interview, and it can be practiced throughout the data collection process with the various data sources (Yin, 2017).

Real-life phenomena can be scientifically studied in-depth and within the context of their environments using case study research. A person, problem, event, organization, group, and even an anomaly can be distinguished as a case (Ridder, 2017; Yin, 2017). For the study, six to 10 participants through purposive sampling are sufficient to identify essential themes and practical applications in qualitative research (Merriam & Tisdell, 2015). The research and interview questions were developed to gain an in-depth understanding of BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. A template was provided for reporting the findings of the multicase study to establish uniformity for the analysis of similarities and differences concerning the participants' views and data for answering the research question (Halkias & Neubert, 2020).

Triangulation is a method for integrating multiple data sources by comparing and cross-checking data to balance the strengths and weaknesses of each independent approach to strengthen the credibility and quality of the study (Guion et al., 2011; Wilson, 2014). Besides validating results and procedures, triangulation is a way to increase the scope, depth, and consistency within the methods of the study (Flick, 2002). The study included interviews, journaling/reflective field notes, and archival data as data sources. For this study, purposeful participant selection was the foundational component of the research design in providing answers to a tightly scoped research question (Eisenhardt & Graebner, 2007; Ravitch & Carl, 2020).

A qualitative, multicase study design was used as it allowed for an in-depth study of holistic and meaningful dimensions of real-life events (Yin, 2017). Yin (2017) stated that researchers perform the case study approach for explanatory inquiries, such as why and how questions, to describe a phenomenon bound by time. When the study's goal is an original contribution of a conceptual or theoretical framework, effective use of a multicase study that includes more than one case can provide a rich, compelling picture of human interaction as compared to a single case study (Eisenhardt et al., 2016; Welch et al., 2020). As an analytic procedure, cross-case synthesis is recommended when examining data in a multicase study to strengthen external validity and improving the trustworthiness of data for more robust research (Merriam & Tisdell, 2015; Yin, 2017).

Researchers develop case study protocols to strengthen the trustworthiness of their study (Baxter & Jack, 2008; Yin, 2017). For a multicase study, the method and research design describe the process and techniques for conducting the research (Tsang,

2013). In the research design, it includes the participant selection logic, the research questions and interview questions to reveal the participants' interview data, as well as data collection and field procedures, identification of data analysis technique, and a template for reporting the multicase study (Stake, 2013). This study began with the research design concerning the participant selection logic.

Participant Selection Logic

Population. Given that the study purpose calls for a detailed description of BI-experts' views, the population from which this study's participants was selected included academics/authors of peer-reviewed papers published in reputable, scientific journals within the subject area of CSFs for BI implementation, and indexed on Google Scholar between 2010 and 2020. The total number of such peer-reviewed scholarly publications totals approximately 59,700 (via Google Scholar). A total of 10 participants were recruited from this population as the purposeful sample for this multicase study. This number for sample sizing falls within the recommended range of six-ten participants for a qualitative, multicase study (Halkias & Neubert, 2020; Schram, 2006). A larger sample size could weaken an in-depth investigation of the phenomena under study, while the upper limit of 10 participants ensured a quicker result for saturation (Fusch & Ness, 2015).

Sampling strategy. To identify and recruit participants for this multicase study, I used Yin's (2017) concept of replication logic, which states that each case in a multicase study is treated as a distinct experiment and as a unit of analysis (Eisenhardt & Graebner, 2007). Since case studies do not involve experimental controls or manipulation, this

method is suitable for meeting the purpose of this study to gain a deeper understanding of BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. In qualitative studies, no sample is seen to represent a larger population. As such, case study research employs nonrandom sampling. Participants for this case study were recruited using purposeful criterion and network sampling strategies. If I needed to supplement the number of participants to reach data saturation, network sampling was used by asking a few key participants who already fulfilled the criteria for the study to refer others who potentially met the study's inclusion criteria (Merriam & Tisdell, 2015).

Sampling criteria. Expert interviews are now frequently considered a standard qualitative research method (Bogner et al., 2018). Flick (2018) suggested that the expert interview is situated within the qualitative paradigm, and expert interviews can also follow standardized communication patterns as applied in quantitative research (survey). Participants recruited for this study were BI experts who met the following inclusion criteria: academics who (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search under the term *self-service BI, BI, CSFs, BI implementation, self-service business analytics, business analytics, self-service technology,* and *BI solutions*; (b) have terminal degrees from accredited institutions; (c) have conducted extensive studies on management, BI, and BI CSFs for users; and (d) possess in-depth knowledge regarding their experiences with the topic of the study (see Merriam & Tisdell, 2015). The specific participant selection logic ensured that all potential

participants met the minimum requirements for recruitment and subsequent participation in the study through in-depth expert interviews (see Bogner et al., 2018).

Sampling selection. The process for identifying and selecting participants in order to gather the BI experts' views was through semistructured interviews that provided answers to the study's research question and enabled the fulfillment of the study's purpose of an in-depth examination of the phenomenon under investigation (Tracy, 2019). Through criterion and network sampling, I actively selected participants who could potentially provide in-depth data for analysis and interpretation. As a unit of analysis, each participant was a case in the study. A case's contextual conditions formed part of the investigation without being pre-controlled or pre-outlined. The case was selected, contrary to quantitative logic, precisely because it was of interest (Stake, 2005), or there may be theoretical reasons for selecting it (Eisenhardt & Graebner, 2007). Maximum variation (heterogeneity) sampling is used in qualitative sampling "to document variations that have emerged in adapting to different conditions" (Lincoln & Guba, 1985, p. 200) and is the preferred sampling mode for constructivist inquiry (Guba & Lincoln, 1994). A multiple-case study researcher can enact maximum variation sampling through purposefully selection sampling (Palinkas et al., 2015). For this study, the focus of the chosen sampling strategy was to ensure a participant pool could contribute a solid understanding of the central study topic and not just generalizations (Baxter & Jack, 2008).

Sample size and saturation. For this multicase study, a small sample of 10 participants was chosen for this multicase study to increase the chances of achieving

saturation efficiently, as well as ensuring the validity and high quality for a trustworthy study (Fusch & Ness, 2015). The candidates were selected from a data pool; then, expert interviews were conducted with study participants for the data collection to increase the credibility and dependability of study findings. During the selection process, I was actively engaged in choosing participants with the most potential for contributing data-rich responses compared to other candidates. After the identification of all participants, I began to build rapport to improve my understanding of the phenomenon and increase the chances of gaining in-depth data from participants.

In this study, the participant selection logic was established from similar studies, as candidates who provided the in-depth knowledge and understanding of the study's topic, not a generalization of the study results (e.g., Costa et al., 2018; Lismont et al., 2019). In other similar studies, Zaied, Grida, and Hussein (2018) surveyed 12 experts' views on ranking the success factors of BI system using a Fuzzy Analytic Hierarchy Process from a sample of BI experts working in Egypt, United Arabic Emirates, Saudi Arabia, China, Hong Kong, and Brazil. In another expert interview study on the application of the corporate systems within the framework of entrepreneurship education, results were obtained based on assessments of nine expert specialists through purposeful sampling (Komarova et al., 2019). Similarly, five interviewees from three companies were interviewed on the current state of research and practice of Big Data in the field of logistics in case study research conducted at Osnabrück University in Germany (Frehe et al., 2014). Conducting semistructured interviews with experts knowledgeable about various subject topics using purposeful sampling can yielding rich answers answering the

research question while also emphasizing the experts' individual perspectives that affect social practices in a field of action (Döringer, 2020).

Instrumentation. The goal of instrumentation in a case study, according is to collect data from multiple sources through instrumentation protocols and processes that are valid and reliable to answer the research questions posed in the study (Yin, 2017). Hence, gathering appropriate instrumentation that aligns with the purpose of the study, providing answers to research questions, and contributing original data to the conceptual framework is an essential process for qualitative studies (Merriam & Tisdell, 2015). Themes emerged after the data were analyzed; data were collected through the appropriate choice of instrumentation to fulfill the purpose of this study and to describe the BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. The three sources of data collected and used throughout this study: (a) interviews conducted using a semistructured interview protocol (Appendix A) with items that had been designed and standardized by previous researchers; (b) archival data in the form of practitioner-based BI reports (Yin, 2017); and (c) journaling/reflective field notes (Merriam & Tisdell, 2015). Data collection was kept by the researcher throughout the entire data collection process. I used multiple data collection methods from multiple sources of evidence for methodological triangulation.

The results of the study were the outcomes of carefully executed and rigorously planned data collection procedures. A typical data collection method in qualitative studies, the semistructured interview, offers a tool with which to gain the researcher a deeper understanding of a phenomenon or phenomena from the participant's perspective.

In this exploratory multicase study, the validated interview protocol addressed the purpose of the study and answered the study's research question: How do BI experts describe their views on the CSFs needed for self-service BI initiatives among casual users in the post-implementation stage?

This research used multiple sources of evidence during the data collection process to explore various perspectives with interview participants within the context of the study. Data triangulation can assist in assuring the dependability of results and for improving the quality of a multicase study (Halkias & Neubert, 2020). Triangulation of data sources was conducted to establish further trustworthiness of the study's data analysis (Guion et al., 2011; Merriam & Grenier, 2019).

Semistructured interview protocol. The primary tool used in this research was face-to-face semistructured interviews with open-ended, focused interview questions asked of the participants (see Yin, 2017). Potential participants were asked of their availability for an interview via a recruitment letter (Appendix B) that informed interviewees of the essential nature and purpose of the research. An informed consent form (Appendix C) was provided to potential participants, and the researcher used a semistructured interview protocol (Appendix A). The interview protocol included semistructured questions centered on eight well-chosen questions grounded in the Conceptual Framework and the reviewed literature presented in Chapter 2 (see Rowley, 2012).

Aminy et al. (2019) developed the interview questions in an open-access study at Lund University in Sweden. The researchers' problem, purpose, and study design aligned with my study's foundational elements and was stated as follows:

> With the introduction of Self-Service Business Intelligence (SSBI) systems, more and more organizations are considering deploying SSBI. Despite this, those organizations who have adopted SSBI report low success rates. Therefore, there is an increasing need to guide organizations towards succeeding with their SSBI initiatives. (Aminy et al., 2019, p. 1)

In order to guide organizations towards SSBI success, this study has conducted 10 interviews with BI experts regarding those CSFs (CSFs) contributing to SSBI success. .Aminy et al. (2019) grounded each item from the theoretical literature, the authors' knowledge of SSBI, and experiences of researching frameworks explaining CSFs for SSBI.

Adapting with Aminy et al.'s (2019) instrument design to my study, there were four separate sections to the interview protocol: (a) background information and professional experience of the participant, (c) the semistructured questions addressing the purpose of the study and defining critical terms before the interview commences, and (d) a debriefing section. The interview protocol can be seen in Appendix A. The authors used theory protocol to interviewed participants within Sweden. To reach maximum variation sampling and extend the study's conceptual and theoretical framework required for a PhD-level study, I interviewed the participants that met the inclusion criteria as subject-matter-experts in BI and from various countries as recruited from the LinkedIn online

professional network. The participants responded to all semistructured questions of the interview in approximately 30 to 40 minutes (see Yin, 2017). Given that the interview protocol questions were validated via a previous study, no pilot study was required to duplicate this process.

In the study, the validity of the instrument is dependent on the transferability of the findings. According to Merriam and Tisdell (2015), transferability is related to external validity; both concepts are associated with how much the reader can infer if the findings of a study are applicable to other contexts or situations (Merriam & Tisdell, 2015). For many qualitative studies, transferability is a challenge because the findings are bound to certain settings and individuals; therefore, it is reasonable that the results of this study may apply to populations beyond the participation group (Stake, 2013).

Archival data: practitioner-based BI reports. Triangulation is a core part of case study research and an investigative approach that is used during a field study in addition to the subsequent detailed examination of data (Yin, 2017). The role triangulation plays during the qualitative research process is highly essential: it contributes to giving depth to the data collected because it is a systematic approach for confirming or contradicting data (Guion et al., 2011). The outcome of the qualitative interviews was triangulated with a few archival documents. Archival data in the form of practitioner-based BI reports were used. Also, I examined a few databases relating to casual users and SSBI CSFs. These two archival data sources were used for triangulation to answer the research question and support credibility and trustworthiness regarding the findings of the study. Related qualitative multicase study research questions by Neubert

(2016) and Komodromos (2014) have also been answered using archival data to triangulate interview data.

Journaling/reflective field notes. The nature of the research question and the model supporting a qualitative research design determines how reflexivity through field notes allowed for unstructured observation using reflective for data collection (Alvesson & Sköldberg, 2017). Reflective field notes from semistructured interviews conducted for this research and online observations were the third instrument to be used for data collection for this research. The researcher's personal reflexivity was mitigated during a face-to-face interview conducted online. Interviewing through Skype or Zoom supports the replication process by enabling the researcher to reach participants in geographically dispersed locations (Janghorban et al., 2014), and sustaining an unbiased atmosphere (Yin, 2017).

Online data collection may consist of interviews, interaction, and self-observation (Kozinets, 2019; Merriam & Tisdell, 2015), considering the majority of online data are documented and saved as they happen in real-time. Reflective notes provided the researcher with the means to notice and gather more available information about the perceptions of interaction within the naturalistic research setting as opposed to the data collection of the presentation of the questions and recording of the descriptive responses within the constructive paradigm (Stake, 2013). The reflective notes may offer more insight into the perceptions of the interactions; therefore, I prioritized the analysis by reviewing the reflective notes, then the observational field notes. The observational field notes were recorded to capture nonverbal cues by observing the respondents regarding

their personal emotions, appearance, and other body languages during face-to-face, Zoom, and Skype interviews (Kozinets, 2019).

Aligning with standard practices in investigations driven by the multicase study design and research method, and as deployed in related multicase study researches (Halkias & Neubert, 2020), "netnographic" field notes are a practice for an interpretive online research methods to gather reflections, interactions, and experiences during the interviews using telocommunications and used as a secondary data source for triangulation prompt during the process of data analysis (Kozinets, 2017). Transferability drove the trustworthiness of this study's instrumentation, to offer results that may apply to sample groups in a different context or setting (Merriam & Tisdell, 2015). Transferability can motivate future researchers to carry out further investigations and highlight the possibility that the findings of this research study could be valuable to other individuals beyond the population of participants (Fusch et al., 2018; Stake, 2013).

Procedures for Recruitment, Participation, and Data Collection

For this qualitative multicase study, the sample size was between 6 and 10 participants for saturation purposes. A group of up to 10 BI-experts was recruited for in-depth interviews, which allowed for the realization of data saturation (Fusch & Ness, 2015). To achieve the saturation point, the data collection of the study should no longer be yielding new themes or information (Glaser & Strauss, 1967; Mason, 2010; Yin, 2017).

At the beginning of the recruitment, I conducted a search on Google Scholar for BI-experts and identified those candidates who fulfilled my sample inclusion criteria.

Next, I used the LinkedIn online professional network as my recruitment tool to identify the candidates. For candidates that met the inclusion criteria, I sent the recruitment letter for the initial contact with an invitation to contact me via personal message or email address. Candidates signed the informed consent form (Appendix C) that were interested in volunteering their time to participate in the study. After a participant signed the consent form, I scheduled an interview with each participant and used Skype or Zoom, an internet-based method of communication (Lo Iacono et al., 2016). Skype and Zoom are a telecommunication application that allows for expert interview interactions and supports the researcher's effort to maintain an unbiased atmosphere by avoiding contextual information (Bogner et al., 2018).

During the qualitative expert interviews, the study participants shared their view on guidance on which CSFs may enable casual users to fulfill their SSBI needs in the post-implementation stage. Other researchers and practitioners have used qualitative expert interviews across multiple disciplines for research (e.g., international relations, politics, sociology, policy research, and organizational research; . Because the nature of research studies are exploratory, expert interviews are more useful for the data collection than observations (Wästerfors, 2018) or quantitative experimental research (Yin, 2017). The open nature of expert interviews, although in the form of semistructured interviews, may yield data from experts' breadth of knowledge and experience in research fields that still need exploring (Littig & Pöchhacker, 2014). Such data collected from expert interviews might uncover challenging or even difficult to access to these fields of research (Bogner et al., 2018; Littig & Pöchhacker, 2014).

Following approval by Walden University's Institutional Review Board (IRB), I emailed a recruitment letter to each potential participant and invited them to take part in the study. Additionally, I sent them a consent form that included the following information: (a) explanation of what the study entails; (b) the option to withdraw; (c) the procedure; (d) possible risk or discomfort associated with participation; (e) the estimated time for the member checking and interview; (f) a statement of voluntary participation and no consequences for refusal, (g) rights to confidentiality, and (h) the benefit of this study for IT managers and casual users in the BI field, but no direct benefit for study participants. Those candidates who respond positively to my recruitment post were invited to participate in the study. They were asked to provide their email address, telephone number, and Skype/Zoom ID for communication purposes.

As the primary purpose, interviews, as a qualitative method to collect data, were used to gain an in-depth understanding of the participants' knowledge and experiences. During the interviews, I was focused on conversations with participants that engage them in discussing their experiences about the study's topic and the production of relevant data. If recruitment results failed to generate enough participants, I planned to employ network sampling for finding additional business intelligent experts until a group of six or 10 willing potential participants could be assembled (Merriam & Tisdell, 2015). In the expert interview protocol, I created open-ended questions that align with the topic of the study. The questions were presented for capturing the study participants' views on the CSFs that contribute to the success of SSBI initiatives to fulfill that casual users' needs in the post-implementation stage (Yin, 2017).

Of critical importance is the need for Walden University to approve the IRB application before conducting expert interviews with Skype, Zoom, or telephone call. A number of 10 interviews were conducted, and associated archival data collected daily throughout the data collection process. Each interview took approximately 30 to 40 minutes, and the data recorded with either Skype or Zoom digital audio recorder, complemented by handwritten notes for journaling that provided further reflection (Stake, 2013). To retain a copy of the conversations, I used the Windows 10 voice recorder and a transcriber application for recording and transcribing the participants' responses. Then, I used the Microsoft Excel software for electronic storage of the data collected from each interview for recording, documenting, analyzing, and categorizing the data collection. As a research tool, Microsoft Excel is suitable for storing data, documenting data from interviews, analyzing data with a thematical approach, and categorizing information through numbering (Tracy, 2019).

I thanked the participant at the end of each Skype or Zoom interview and informed them that they might be contacted again for further clarification of their responses if needed. For this study, it was important to assure each participant that their identity would remain anonymous, and the data collected would stay confidential. I saved all communications and the data collected concerning the study on my laptop, personal USB Flash Key, and Dropbox, locked with a password. I also stored all the electronic files on a secured server behind a firewall in a folder with authorized access to include only me. For validating interview responses, I contacted each participant in separate emails with a transcription of their responses. I allowed them 72 hours to review and

validate their responses through a transcript review process (Mero-Jaffe, 2011). The estimated time for transcription review was 30 minutes for each participant.

The review of interview transcripts can help avoid significant errors in the process of the data collection by validating the responses with the participants to assure the quality of the entire study. To prevent mistakes in interview transcriptions, I developed a process to ensure the trustworthiness of the transcripts. When validating their transcripts, the participants had an opportunity to correct them or clarify unclear issues if necessary (Davidson, 2009; Mann, 2016).

Data Analysis Plan

With case study research, the study's alignment occurs with the researchers' assessment of the topic of the study and sample size. For researchers, their primary responsibility is to know the extent and type of data needed, as well as the management of an interview, such as interview protocols, to yield quality responses when conducting interviews (Jacob & Furgerson, 2012). The interview questions are crafted to disclose authentic and relevant trends among the study participants to link the overall purpose of the study. In this study, BI experts were the unit of analysis for this study. Theoretical propositions can be associated when using five questions in analyzing case studies (Yin, 2017). To achieve this case study's goal, a semistructured format was used to construct the questions for the interview protocol of this study (Appendix A). After the information was gathered from semistructured questions and answers, data were categorized. Near the end of the research, the researcher analyzed the responses of the participants to look for

patterns, as well as reviewing and integrating contrasts across multiple sources of data for triangulation (Merriam & Grenier, 2019).

For the data analysis process, the researcher accumulated all the data collected from the interview transcripts, journaling notes, and archival data and develop categories and themes through content analysis (Merriam & Tisdell, 2015). To ensure accurate data, transcription of data was used for the analysis; and then analyzed, coded, and categorized using a Microsoft Excel Spreadsheet (Yin, 2017). With the formation of a case study database, the identification of themes, words of significance, viewpoints, and documented work were analyzed and organized through thematic analysis to assist with developing themes and models from the data (Yin, 2017).

In the current study, data analysis included two stages. The first stage involved a within-case analysis of each of the selected cases for learning about the contextual variables, and the second stage consisted of a cross-case analysis of data for finding similarities and differences across the categories and themes (Yin, 2017). In regards to the within-case analysis, the data collection of transcribed interviews and field notes from each case was arranged in data segments, indexed with line numbers, and arranged in line with the interview questions for ease of identification of codes (Finfgeld-Connett, 2014). Using a Microsoft Word table, the identified codes were recorded in a matrix form with columns that capture the data segments, the assigned codes, and the researcher's reflective notes (Saldaña, 2016). As the researcher creates memos, the goal is to describe the emerging patterns and categories, as well as other topics of refection (Saldaña, 2016). The codes were classified with shared common meaning into categories, then progressed

into themes (Saldaña, 2016). In the cross-case analysis, each case was evaluated separately before synthesizing the data from each case, which strengthened the robustness of the study's results (Eisenhardt & Graebner, 2007; Yin, 2017).

Multiple approaches exist for analyzing qualitative data (Maxwell, 2012), and I selected an appropriate technique for analyzing the expected data to answer the research question. In qualitative data analysis, the objective of coding does not involve the calculation or tally of an object; it is "fracturing" data by rearranging text descriptions to compare items within the same category (Maxwell, 2012). The words and phrases of segmented data can share the same meaning with assigned codes, while the categories are a way to connect them (Maxwell, 2012). For this study, the descriptive coding method was applied as the basic analytical technique, which consisted of assigning symbolical meanings to data segments and providing a collection of words or phrases for indexing and categorization of data (Saldaña, 2016). Saldaña (2016) recommended that the descriptive coding method is suitable for novice qualitative researchers who are still learning how to code qualitative data.

In multicase study research, Yin (2017) recommended cross-case synthesis as the most appropriate data analysis technique. For a PhD study, the cross-case synthesis is more efficient than content analysis because the cross-case synthesis involves comparing and contrasting cases rather than analyzing individual cases for content analysis (Halkias & Neubert, 2020; Yin, 2017). The cross-case synthesis technique is a method that handles each case separately while accumulating the findings across a series of individual cases. Consequently, the cross-case synthesis is not different from other research syntheses that

aggregate and compare findings across a series of individual studies. The research designs with both within-case and cross-case synthesis have proven to offer a more consistent platform to generate theoretical propositions and constructs than designs that use only the within-case analysis (Barratt et al., 2011)

I followed Yin's (2017) recommendation for a *ground-up* strategy to analyze the case study data that allows for critical concepts to emerge by carefully examining the data. With this strategy, it was the most suitable method to explore the data for insights and relationships of the present study to align the emerging concepts with the research question (Yin, 2017). For analyzing the case study evidence, the ground-up strategy is consistent with the analytical technique, descriptive coding method (Saldaña, 2016).

After coding the data from the interview questions, the aim was to link the themes to classifications grounded in the conceptual framework and the literature review in Chapter 2. As the researcher, I identified codes of common themes that arose from the participants' responses while collecting research and other field notes (Merriam & Tisdell, 2015). To aggregate the outcomes of thematic analysis, I applied cross-case synthesis as the data analysis technique for this multicase study. With this type of synthesis, it allowed me to determine if the case studies were comparable through analyzing convergence and divergence of the collected data (Yin, 2017). Each of the cases offered evidence to describe BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.

Issues of Trustworthiness

Trustworthiness involves the concepts of credibility, transferability, dependability, and confirmability as used for ensuring the methodological rigor of a qualitative study (Morse, 2015). Skulmoski et al. (2007) indicated that the systematic use of journals and audit trails of all essential issues or information about the theoretical approaches, methodological choices, and data analysis during the study promotes the study's trustworthiness.

Credibility

Credibility refers to the internal validity of the study for how the research findings fit with reality to assess the trustworthiness of the research (Merriam & Tisdell, 2015). To ensure credibility, some of the strategies are peer debriefing, member checking, prolonged engagement, knowledge of the issues, negative case analysis and rival explanations, triangulation, and referential adequacy (Lincoln & Guba, 1985; Yin, 2017). I took the time needed to gain extensive knowledge of the topic by reviewing the literature to develop the study's interview protocol for gathering data and reaching data saturation. During the data collection and analysis, I defined a process for the transcript review that involved sending the transcripts to the participants for verifying and assessing results in the efforts to establish the validity of the results (Birt et al., 2016; Mak-van der Vossen et al., 2019). To verify the interview questions were relevant to answer the research question and meaningful to the participants, I performed field testing with subject-matter-experts.

Transferability

Transferability refers to the level of inference drawn from results to a different context of interest (Morse, 2015). With interpretivist, qualitative research, generalization involving transferability is associated with the setting, researcher's analysis and understanding of the circumstances, and group under study, as context-dependent knowledge (Carminati, 2018; Yin, 2017). Birt et al. (2016) stated that the responsibility of researchers is to provide knowledge by developing strategies during their analysis for assuring the participants retain their voice and allow readers to decide on the possible transferability of the results. Other readers may be able to determine the transferability of the findings with in-depth, rich descriptions of collected and analyzed data (Carminati, 2018).

For this study, I preserved the meaning and inferences through thick descriptions, member checking, prolonged engagement, observation, triangulation, member checking, audit trail, and reflexivity (Houghton et al., 2013). In a study to critically review the use of experts as participants, Paraskevas and Saunders (2012) employed purposive sampling strategy with a group of 16 senior hotel executives from the Americas, Europe, Middle East, Africa, and the Asia Pacific to collect rich descriptions related to the topic, to gather the variations of responses from the experts, and to reaffirm the responses to answer research questions.

To ensure the transferability of the findings, researchers need to maintain consistency with the methodology approach and provide a detailed description of the research process and problem (Anderson, 2017; Carminati, 2018; Delmar, 2010).

I used the purposive sampling strategy to identify experts as academics and authors of peer-reviewed papers published in reputable scientific journals within the BI subject area indexed on Google Scholar between 2010 and 2020. With a careful selection of participants, a small sampling size was created for the study; the expertise of the group supported reasoned arguments rather than biased assumptions for reaching sufficient data saturation (Hasson & Keeney, 2011; Morse, 2015).

Dependability

In qualitative research, dependability refers to the consistency of results with the data collection and if the findings are logical, which increases the possible replication with the concurrent use of various strategies (Merriam & Tisdell, 2015). To ensure dependability, researchers apply audit trail, "overlapping methods," such as triangulation, detailed methodological description, and peer debriefing (Morse, 2015). Amankwaa (2016) proposed a trustworthiness protocol that aligns with the research process and the identification of the activities and detailed descriptions. The alignment among the research gap, problem statement, research question, methodology, and research design is essential to strengthening the methodological approach of the study.

To ensure dependability, I created a procedure for the methodology. I also developed audit trails to document and describe every action and decision occurring during the data collection process. For this study, audit trails were used to illustrate and log the research progress and future activities. In conjunction with audit trails, I maintained the chain of evidence for effective alignment between each step of the research process, as well as associating the results to the research question (Yin, 2017).

Confirmability

Confirmability refers to the extent to which the results express the concept of objectivity by maintaining the detailed descriptions of the expert's responses and managing the subjectivity of the researcher (Hasson & Keeney, 2011; Morse, 2015). To ensure knowledge objectivity and confirmability, researchers employ audit trail and reflexivity (Berger, 2015). Researchers need to be aware of their own subjective, recognize their role as the researcher rather than the expert, and compose unbiased questions with effective strategies to maintain the rigor of the study (Morse, 2015).

In developing reflexivity, the researcher becomes mindful of their position and the social and emotional connections with others when preserving the participants' perspective and voice; a self-reflected diary or research journal can support the researcher's reflexivity (Berger, 2015). Several strategies are used for the confirmability of a study, including audit trails to describe the steps during the research, triangulation as a method to collaborate and ensure consistency of results, and researcher reflexivity for reflecting upon what is happening during the research process (Amankwaa, 2016). For this study, I documented my beliefs, assumptions, and emotional experiences in a reflective journal and ensured a transparent data collection process.

Ethical Procedures

I sent an email message to potential candidates that specialize in BI with the use of LinkedIn to request their involvement with the study (Appendix B) and the informed consent form (Appendix C) that contained all the required information regarding, among other issues, anonymity and confidentiality, potential risks and benefits, and the contact

information of the IRB. Candidates contacted me through the LinkedIn platform if they are interested in participating in the research study. It was an approach to respect the confidentiality of their identity and verify that they met the inclusion requirements of the study. Upon the verification of the selection criteria, potential candidates had to agree to the conditions and terms of the informed consent before participating in the study. I coordinated interviews via Skype or Zoom with candidates after receiving the signed informed consent form. To establish a mode of communication, I requested that participants provide their private email addresses for on-going contact throughout the study.

For each participant, I sent an email with the agreed-upon date and time of the interview. I confirmed that each participant understood the voluntary nature of their participation in the study, individual privacy and confidentiality, do-no-harm principle, and data protection. With internet research, researchers have a responsibility to safeguard the ethical principles of respecting participants, avoiding harm, and protecting data and privacy in a multifaceted and dynamic environment (e.g., terms and conditions of virtual platforms, complex cultures in online forums) (Kantanen & Manninen, 2016). I answered questions and addressed issues with each participant by corresponding with direct and separate emails to the participants to reduce miscommunication.

In this study, no ethical concerns were related to recruitment materials and processes. In establishing the do-no-harm principle, it required the approval of the IRB for the study's proposal. To my knowledge, no ethical concerns existed with the data collection. I informed the participants that their participation in the study would involve

their knowledge as academics and authors of peer-reviewed papers published in reputable scientific journals within the BI subject area and that no specifics regarding their organization would be requested. The clause of voluntary participation was found in the informed consent, and it was the participants' decision if they wanted to take part in the study. If a participant withdrew from the study early, I reassured the participant that no one would treat them differently; this information was also cited in the informed consent form.

I created a folder for each participant, saving all transcripts of interviews and communication that correspond to the participant. The interview data and analysis were located on my laptop, personal USB Flash Key, and Dropbox, locked with a password. All electronic files were stored on a secured server behind a firewall with authorized access to include only me. Owan and Bassey (2019) explained the importance of the data management practices through deidentification of the responses, use of very strong passwords, storage of data in a secure folder, thus employing the standards of privacy, anonymity, and confidentiality, as well as the use of the data collection for its intended purpose.

I confirmed that the informed consent form included the appropriate data management practices to adhere to acceptable data management practices, and I shared the data with the Chair and Committee Member only. Data encryption and passwords were used for the transfer of sensitive and confidential data. After five years, Owan and Bassey (2019) stated that computerized data requires the special file shedding software to destroy data to address data remanence for addressing potential harm caused by the

recovery or unintended discloser. I abided by the ethical practices, and after five years, the interview related-files regarding the present study were deleted from my laptop, personal USB Flash Key, and Dropbox.

As the study progressed, I reflected on the ethics in deploying the multicase study design and BI experts' participation to make adjustments if needed. Tracy (2010) stated that the ethical quality is the researcher's responsibility for ensuring the study's ethical procedures, relationships with the participants, circumstances of the situations, and release of information with the practice of self-reflexivity, multivocality, and self-consciousness. To address any potential conflicts of interest, I conducted this research study outside my personal and professional context, and I collected the data anonymously. For the existing ethics, I ensured that the communication of this study's findings would contribute to positive social change.

Summary

The purpose of this qualitative, multicase study is to gain a greater understanding of BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. In this study, the instrument was the semistructured interview with open-ended questions interviewing participants. This type of discussion was an approach that allowed the participants to express their views. Archival data were collected in business and industry reports, media articles on BI, and journaling/reflective field notes and analyzed to validate the findings and strengthen the study's trustworthiness.

In Chapter 4, I present the data analysis results to answer the research question. Procedures with detailed explanations will be given for collecting and analyzing the data from the 10 semistructured interviews. In the procedures, the interview protocol will be defined. The explanations will incorporate any unexpected organizational, procedural, or situational conditions occurring during data collection. It will also include provisional evidence of trustworthiness (credibility, transferability, dependability, and confirmability).

Chapter 4: Results

The purpose of this qualitative, multicase study was to describe BI-experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. From the data collected to answer the research question, I was able to gain a deeper understanding of theoretical insights and practitioner-based knowledge of the CSFs needed for SSBI initiatives among casual users, which were previously unreported in the extant literature. The research question that guided the development of this empirical study was as follows: How do BI experts describe their views on the CSFs needed for self-service BI initiatives among casual users in the post-implementation stage?

IT managers lack knowledge of the CSFs required for successful SSBI implementation (Villamarín-García, 2020; Weiler, Marheinecke et al., 2019; Yeoh & Popovič, 2016). The extant literature on SSBI studies on casual users is mostly practitioner-oriented; thus, there is a gap on BI experts' guidance on CSFs for successful SSBI use among casual users in the post-implementation stage (Berndtsson et al., 2019; Lennerholt et al., 2020). Scholars conclude that IT managers have sparse information on the CSFs for SSBI initiatives among casual users in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020). However, the results of this study may be significant in informing IT managers on how to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality so they can complete their assigned IS-related tasks successfully (Berndtsson et al., 2019)

The research design and approach of this study were grounded in the study's conceptual framework, which was built on two conceptual models that aligned with the

purpose of the study: (a) Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users, supports that casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060), and (b) Yeoh and Koronios' (2010) The Framework of BI Success, introduced "an extensive framework identifying the CSFs influencing BI systems success" (p. 25). SSBI research is a topic of interest with opportunities to extend existing models and inform the IT management practices of the challenges with SSBI initiatives (Aminy et al., 2019; Blut et al., 2016; Yeoh & Koronios, 2010). This study may be significant to theory and extend academic knowledge in guiding casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) based on the views of subject-matter-experts.

This chapter presents an analysis of the results from this multicase study based on two approaches: thematic analysis and cross-case analysis. As recommended by Yin (2017), the first approach, thematic analysis, is based on the data collection of the study's multiple sources: (a) a semistructured interview protocol (Appendix A), whose elements were designed and standardized by previous researchers; (b) archival data in the form of practitioner-based BI reports (Yin, 2017); and (c) journaling/reflective field notes (Merriam & Tisdell, 2015), which I maintained throughout the data collection process. For triangulation purposes, I used multiple data collection methods from multiple sources of evidence.

In the second approach, I used cross-case analysis to analyze the data recommended by Yin (2017). With this analysis, I synthesized the findings of the initial thematic analysis to answer the research question. Using thematic analysis, the different approaches ensure the rigor of research design and results' trustworthiness (Boyatzis, 1998). For example, Boyatzis (1998) compared different codes, such as theory-driven codes obtained from the researcher's codes or other existing theories and inductive codes; the researcher applies a bottom-up strategy of reviewing data as prior research-driven codes. All approaches are useful to qualitative data analysis, "thematic analysis is flexible and what researchers do with the themes once they uncover them differs based on the intentions of the research and the process of analysis" (Boyatzis, 1998, p. 63).

The multicase study design's primary goal is to replicate the same findings across several cases by exploring the differences and similarities between and within cases (Eisenhardt & Graebner, 2007). This research was an extension study that provides replication evidence and expands previous studies' findings in other theoretical areas (Bonett, 2012). For a multicase study, the minimum number of cases is relative to the research question and its purpose. To gain an in-depth understanding of the phenomena under study, Eisenhardt (1989) suggested a limit for the number of cases (e.g., 4–10 cases).

The unit of analysis in this study was the BI expert. Each unit of analysis, the BI expert, becomes a case study by itself (Eisenhardt & Graebner, 2007; Yin, 2017). In a multicase study, data collection methods support the research design that contributes to yielding reliable results and answering the research questions (Shenton, 2004). The

reliability of data collection methods ensures rigor and credible results for replication studies in the future (Yin, 2017). Throughout this chapter, I describe the discovered patterns and recurrent themes. With this analysis, I maintain the voices and perspectives of the participants. As recommended by Yin (2017), the study's sample population, categories of codes, themes, and a cross-case synthesis of themes are also presented below.

Research Setting

For this multicase study, I collected data via semistructured interviews with 10 academics. The inclusion criteria were: academics who (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search under the term *self-service BI, BI, CSFs, BI implementation, self-service business analytics, business analytics, self-service technology, and BI solutions,* (b) have terminal degrees from accredited institutions; (c) have conducted extensive studies on management, BI, and BI CSFs for users; and (d) possess in-depth knowledge regarding their experiences with the topic of the study (see Bogner et al., 2018; Merriam & Tisdell, 2015).

The participants were recruited using network sampling through the LinkedIn professional social media platform and the literature review's primary references. After recruitment, I initiated the first contact via email with each of the participants. I attached the consent form with the email. After each participant sent a reply email that acknowledged and accepted the consent form, I planned an interview. Each interview included only the participant and the researcher. The meeting was based on a mutually

agreed-upon day and time, corresponding to an acceptable schedule for the participants within the research study process timeline.

The semistructured interview protocol (Appendix A) was created to ensure the participant was comfortable, and the interview could be conducted without interruptions. It enabled the participant to offer in-depth responses about the subject matter and engage in the interview process without worrying about confidentiality and anonymity issues. Using the LinkedIn platform, the recruitment did not meet the required number of participants for the study. After the first contact via email, five of eight candidates participated in interviews from the LinkedIn platform. Using the primary references, four of eight candidates participated in interviews. One candidate participated in a referral from another candidate. A change occurred in the research setting by using primary references for recruitments, and two candidates preferred to send written responses. Another participant was only joined by audio due to the latency with the video connection.

Demographics

In the study, 10 academics/experts met the eligibility criteria: nine men and one woman. They had published peer-reviewed articles, books, and book chapters with terminal degrees from accredited institutions. Two participants possessed in-depth practitioners' knowledge regarding their BI; their authorship was less than five peer-reviewed articles as per the criteria requirements.

The demographic characteristics were relevant variables in defining the conceptional framework. The characteristics included age, gender, years of experience as

an academic researcher/publisher, and the number of peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020. The given pseudonyms are in an XY format so that X is presented by the generic letter P symbolizing for "participant," and Y is the numerical identifier assigned to each participant.

The sample demographics were male (8/10) and female (1/10), ranging between 28 and 64 years of age (AVE = 46.90). Their BI academic researcher/publisher's experience and publications ranged between 5 and 40 years (AVE = 11.60). The number of peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 ranged between 2 and 41 (AVE = 16.00). For the study, the main subject areas included self-service BI, user acceptance, ease-of-use analytic, ease-of-use, BI, CSFs, user-reliance, user-reliance challenges, user uncertainty, user competency, and user training.

Data Collection

Data collection began on 5 September 2020; it occurred after receiving IRB approval on 27 August 2020 from Walden University. A total of 10 academics/experts participated in the study: eight participated through the interview process via Zoom, and two participated by writing responses. Each interview duration was between 30 and 40 minutes and scheduled between 5 September and 18 October 2020. On 18 October 2020, the data collection phase stopped; 10 participants expressed themes, such as be a skilled casual user, be an analytical enabler, and build data quality with tools, standards, and education, and no new themes emerged; hence, data saturation was reached.

By collecting the data and conducting the interviews, evidence of data saturation occurred when themes emerged and contributed to answering the research question. Aminy et al. (2019) recognized the need to guide the CSFs contributing to the usage of analytics and successful SSBI initiatives. As a result, Aminy et al. (2019) suggested the CSFs, such as user management, the collaboration between business and IT, data quality, data governance in relation to maturity, and semantic layer strategy. Triangulation of multiple data sources showed the commonality of the themes of creating empowerment through macro BI management and supporting appropriate organizational education. More information on the data saturation process is provided in the Study Results section.

For over 30 days, the following activities were performed: (a) emailing participants for recruitment, (b) scheduling and conducting interviews, (c) journaling/recording the reflective field notes, (d) reviewing the seminal literature, and (e) managing the transcript review, which allowed the participants to check the responses on the transcription from the interview. An audit trail table was created in an Excel spreadsheet to record every action during the data collection process with each participant. It was used to track progress and anticipate the remaining actions (e.g., initial contact, consent form sent and acceptance, interview schedule and complete, transcript sent and received). Both audit trails and journaling/reflective field notes monitor the data collection process, promote an effective data analysis process, and establish rigor.

Data collection occurred over a period of six weeks between 5 September and 18 October 2020. eight participants were interviewed from 10 participants through a video conference via Zoom; the two participants provided written responses by email. After

each participant sent a reply email that acknowledged and accepted the consent form, I planned an interview. Each interview included only the participant and the researcher. The meeting was based on a mutually agreed-upon day and time, corresponding to an acceptable schedule for the participants within the research study process timeline. The semistructured interview protocol was created to ensure the participant was comfortable, and the interview could be conducted without interruptions (e.g., office or home setting). It enabled the participant to offer in-depth responses about the subject matter and engage in the interview process without worrying about confidentiality and anonymity issues.

As a researcher, I started documenting my perspective of the events when I received IRB approval from Walden University on 27 August 2020 and continued as I began collecting data on 5 September 2020. During this time, I captured my beliefs, assumptions, and emotional experiences and comments, reactions, and experiences related to the data collection process to ensure transparency. The comments included notes from participants at the time of recruitment, interview scheduling, and transcription review. Throughout the data collection process, I noted the informal aspects of the participants' interactions and the researcher. The study's subject matter was a topic of mutual interest, and it became an initial step in gaining rapport. Having a common interest and finding respect with a participant was satisfying; this provided the data collection process with an added dimension of significance and value. As a researcher, I obtained a high level of understanding regarding collecting data and conducting interviews. I also acquired invaluable knowledge from BI management academics, making these qualitative research interactions a rich experience.

During the data collection process, challenges arose with finding participants, scheduling appointments with experts, and connecting with video. The LinkedIn professional social media platform was not sufficient to establish the first contact with all participants to meet data saturation. Resolving this issue, I continued my effort with subsequent contacts through email to individuals of the primary references in the literature review. A candidate identified as a primary reference was unable to conduct an interview and provide a qualified candidate. The candidate agreed to the consent form and joined the study. Some interviews were not scheduled immediately after the signed consent form; a reminder email was sent before an agreed-upon date and time occurred. After scheduling, the interview occurred as planned; time zones were respected, and the anonymity of identity and confidentiality of data was reassured. Opting out of a video interview, two participants received the interview protocol document and decided to write their responses. An issue occurred regarding an interview with Zoom and low voice quality due to the bandwidth's latency that distorts the voice quality, so the video was turned off to maintain the conversation. In other interviews, issues did not occur with Zoom video and Zoom digital audio, and the Zoom recording. In all interviews with Zoom, the digital audio recording was viable for transcription.

In each interview, I followed the interview protocol. I asked the participants to describe their views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. The participants were asked the eight questions of the interview protocol. One question was divided into two sets of questions, the first on the education topics for casual users and the second on the responsibility of business schools

and IT departments. Other questions covered topics such as the use of BI-skills, empowerment of casual users, assurance of data quality, the success of SSBI initiatives, and CSFs of SSBI initiative success. Definitions of the terms were provided to the participants to ensure consistency. They shared a common understanding of these terms: BI, CSFs, casual users, and SSBI.

Initial Contact

I initiated the first contact with the participants on 5 September 2020 through the LinkedIn professional social media platform using network sampling, following which a first contact was initiated via email with each participant. The criteria used to recruit the participants were: (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search under the terms *self-service BI, BI, CSFs, BI implementation, self-service business analytics, business analytics, self-service technology, and BI solutions,* (b) have terminal degrees from accredited institutions; (c) have conducted extensive studies on management, BI, and BI CSFs for users; and (d) possess in-depth knowledge regarding their experiences with the topic of the study (see Bogner et al., 2018; Merriam & Tisdell, 2015). Several participants were identified and contacted based on their BI research, co-authoring peer-reviewed articles on this study's subject matter. Other participants were identified as primary references in the study: one participant is a referral from a candidate who was a primary reference.

The standard consent form from the last participant who agreed with the terms was received on 10 September 2020, and the final outreach for participants ended after

the last interview was conducted on 18 October 2020. As indicated in the recruitment procedures in Chapter 3, I identified BI experts who fulfilled the sample inclusion criteria through Google Scholar. A recruitment letter was posted to candidates meeting my inclusion criteria by sequential order through this online professional network platform. I asked them to be included in the study's sample for the initial contact and attached a consent form via designated email with a personal message.

In the same sequential order, most of the candidates respond to participate in the study from the LinkedIn online professional network. The candidates' emails arrived almost simultaneously after sending with my designated email (the initial contact). After receiving these emails, most participants immediately sent the consent form after initial contact; other participants agreed to consent forms after a duration of time from the initial contact. In some cases, the interviews were not scheduled immediately after the participant agreed to the consent form. The participants of the inclusion criteria shared positive feedback on the study subject. Participants were encouraged to contact other members whom they deemed to meet the criteria. During network sampling, 10 members agreed to participate and agreed upon the terms of the informed consent.

Interviews

Candidates were sent an email requesting a day and time to schedule an interview as soon as they returned the agreed-upon consent form. After the initial contact, candidates responded in a few days if they wanted to participate. Half of the participants agreed to an interview in the days after the initial contact. A few of the participants waited to schedule an interview or write responses to the interview questions. As data

was collected, the COVID-19 epidemic continued to impact the global community with social distancing and other constraints that limited normal behaviors. Hence, the interviews were scheduled via videoconference; other participants chose to provide written answers during this period.

Using the Zoom videoconference application, I created a meeting and sent an invitation via email. All but two participants agreed to use the video feature during the interview; an issue occurred regarding low voice quality, so the video was turned off to maintain the conversation. No issues occurred regarding the potential limitations of telecommunications or technical difficulties with Zoom video or Zoom audio for the other participants. In all interviews with Zoom, the digital audio recording was viable for transcription. All the interviews were successfully conducted, resulting in rich answers for the data analysis process.

In the study, eight participants agreed to be recorded via a Zoom videoconference; two participants opted to provide written answers by email. The Zoom videoconference was tested before conducting interviews to ensure the functionality of the technology. However, my computer's voice recorder was open and prepared for use if the Zoom digital audio recorder would not work. Initial issues occurred with the use of the LinkedIn professional social media platform to establish the first contact. Nevertheless, interviews were scheduled according to a plan, as outlined in Appendix C. The participants were located in the United States of America, Australia, Sweden, Germany, in time zones spanning from GMT-8 to GMT+5. The use of Zoom contributed to

identifying, recruiting, and interviewing academics and experts in BI management globally, thereby serving the purpose of the research study (Yin, 2017).

Journaling/Reflective Field Notes

On 27 August 2020, I started journaling and recording journal/reflective field notes upon receipt of IRB approval from Walden University, IRB ID: 08-26-20-0543457. During the collection process, I strived to exhibit patience and flexibility as I noted my progress, and I waited for emails from participants. Each day, I reviewed the audit trail for ongoing progress and set reminders on the calendar for tasks. The spreadsheet was used to ensure major activities and dates were documented during the data collection process. At the end of each week, I sent status updates of my chair's progress concerning the completed interviews. I used a combination of the journal and an audit trail in Microsoft Excel to ensure that both recording media balanced each other, increasing the study's information to validate the data collection process.

As I collected data, I documented my reflections to minimize biases and possible expectations during the process. As an interviewer, I listened with patience to the explanations of the participant. I became mindful of staying objective with an open mind to the participant’s point of view. During the interview, I learned and discovered new insights from the conversations. As the discussions progressed, nonverbal cues enriched their responses to emphasize a specific point of interest or clarify their explanations. The participants’ tone and attitude, and hand gestures, provided a deeper meaning to the answers and enriched the data collection. As I conducted the interviews, it required sensitivity to cultural and personality differences. Each participant was interviewed with

compassion and empathy for their feelings and emotions without judgment or preconceived assumptions. By providing the transcript to the participant, they could reflect upon their answers and rethink their response, then modify, if necessary. (Jacob & Furgerson, 2012).

I chose to focus on listening and observing the participant most of the time and wrote an occasional note during the interview. After the interview, I created an entry in the journal about my thoughts concerning the interview. Next, I watched the video recording and listened to the audio. During this activity, I concentrated my attention by dividing the activities of verbal and nonverbal communication. First, I gained an understanding of the verbal language by listening to the audio recording. Second, I found common patterns and themes by observing nonverbal cues. During the interviews, verbal and nonverbal communication complemented each other as the participants responded to questions and shared their views by changing inflections, gestures, speaking more or less rapidly, deliberating over a particular reply, or pausing.

With a systematic process of manually coding, the emergence of patterns and themes arose from the data transcribed from interviews and the meanings of the social reality constructed by the participants (Vaismoradi et al., 2016). By using a multicase study design, these patterns and themes allow the researcher to analyze the data collected within the cases and across cases (Yin, 2017). Cases are carefully selected to predict similar results, named literal replication and contradictory results, named theoretical replication; the emerging patterns and themes take on their full meaning for further

analysis (Yin, 2017). The triangulation of multiple data sources added another dimension to the dependability and trustworthiness of the data.

The participants were selected according to specific criteria. I observed and noted that all participants, as academics and practitioners in SSBI and BI, in general, were interested in the subject matter and inclined to provide rich responses. The provision of definitions of BI, CSFs, casual users, and SSBI helped all participants achieve the same understanding and identify areas needing attention. Some participants had extensive experience with BI; others authored several peer-reviewed papers on BI. All participants provided honest and thought-provoking insights for detail-rich discussions to develop this body of knowledge.

Transcript Review

After completing an interview, each participant was sent their transcription via email for verification and review (Merriam & Tisdell, 2015). Researchers asked participants to check their responses through transcript review to avoid misinterpretation cases, ensuring answers reflect the interviewee's responses and the credibility of the data used for analysis (Hagens et al., 2009). The researcher and each participant exchanged emails to ensure the accuracy and clarity of the participant's responses. It also enabled the participant to complete inaudible information or thoughts about the subject matter. Concerns are reduced about data accuracy, increasing credibility with the transcript review process (Merriam & Tisdell, 2015). Minimal changes occurred with the transcript review of most participants. Seven participants had no changes, and three participants made minor corrections to the content of the transcript.

During the interview, many participants had the interview protocol as they sat for the discussion, referring to the questions for an accurate response. After I read the question, a participant re-read the item for clarification before answering. Some participants found their responses overlapped with other questions, which created redundancy of the answers. It also increased the time of the interview. The sequence of the questions was designed for a comprehensive review of the subject matter under this study. With IT management and SSBI as the topics of interest, interviewees answered technical and redundant interview questions; the use of transcript review enabled interviewees to review their responses, serving the purpose of data analysis and ensuring compliance with ethical standards. I sent the transcript for each participant via email after completing the interview. In the iterative verification process, the participants reviewed the transcript to clarify their responses and add insights to avoid misinterpretations for the data collection (Mero-Jaffe, 2011).

Participants sent the transcripts via email, increasing the clarity of their insight, expanding their thoughts, and reducing the uncertainty of terms. It was an additional validation process after the interview to complete their responses. Most participants who were interviewed checked and returned their responses within a few days with corrections and additional comments. Four participants did not have corrections. Definitions such as BI, CSFs, casual users, and SSBI were provided either through Zoom or via email to ensure that the participants and the researcher had the same understanding of these concepts. All edited transcripts were stored in a safe, password-protected folder, as per

the ethical procedures underlined in Chapter 3, after which hand-coding of the data began.

Data Analysis

The descriptive coding strategy was used for analyzing the raw data collected to assign meaning to the data segment (Saldaña, 2016). Using the descriptive coding strategy allowed for the emergence of words and phrases for further categorization and thematic analysis. The in-depth experiences of 10 participants were captured from the raw data (transcripts) of their interviews. Data saturation occurred during the data analysis process.

The interview transcripts, journaling notes, and archival data were gathered for the data analysis process through content analysis into categories and themes (Merriam & Tisdell, 2015). In the process, data segments were identified from transcripts, and codes were recorded to capture emerging patterns (Saldaña, 2016). The data collected from the transcribed interviews added to the reflective notes and archival data gave rise to an in-depth understanding of BI management experts' views of the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.

The coding process is a primary method for analyzing qualitative, exploratory research studies (Saldaña, 2016). A standardized, systematic approach when collecting and analyzing data ensures an effective coding process. By aligning the data collection and analysis, it offered concurrent, useful emergence of key concepts and an understanding of the research problem (Stake, 2013). The method involved manual

coding, categorization, and recognition of emergent patterns and themes across the cases during the process.

In the current study, data analysis included two stages, consisting of within-case analysis of each of the selected cases and a cross-case analysis of data for finding similarities and differences across the categories and themes; the same coding method was used to analyze the data within and across cases (Yin, 2017). With the multicase study design, the method is a standardized and consistent approach to understanding an underexplored area and offers the following design benefits. When the same coding method is used to analyze the data within and across the cases, it allows for replicating cases, comparing and contrasting results for an in-depth understanding of the phenomenon under study (Yin, 2017).

The thematic analysis approach was used for the descriptive coding method to code the data (Saldaña, 2016) systematically. The systematic process for mapping the structure of common themes allowed the researcher to shift from collecting to analyzing the data (Saldaña, 2016). Through an indexing method, I discovered data segments from the participants' transcripts that described experiences and categorized sets of keywords (Saldaña, 2016; Vaismoradi et al., 2016). A Microsoft Excel spreadsheet was used for the manual coding process. After checking the participants' transcribed responses, the interview notes were entered into the spreadsheet. During the analysis, the process involved analyzing the participants' responses by finding patterns while reviewing and incorporating the differences across data sources for triangulation (Merriam & Grenier, 2019).

After the data collection and analysis, a Microsoft spreadsheet included segments of data, categories, and themes based on the interview discussions and the transcribed responses. The data analysis process consisted of identifying critical phrases for answering the research question. The process involved recognizing and differentiation the patterns that arose from the themes and disregarding the nonrecurring evidence attributed to individual case compositions. When analyzing the case study evidence, the ground-up strategy, as recommended by Yin (2017), was used to identify codes from the raw data and offered critical concepts to emerge by examining data. It is consistent with the analytical technique, descriptive coding method (Saldaña, 2016). The ground-up strategy involved obtaining the relevant phrases from the transcribed responses and assigning them with codes for further analysis. With this coding process, emerging themes were categorized from each participant's interview and common relationships across the participants' interviews (Yin, 2017).

For this study, the thematic analysis was accomplished by hand-coding the data through a systemic process mapped out in the descriptive coding method (Saldaña, 2016). The descriptive coding method involved assigning meanings to segments of data collected from the interview. The interviews were a description of the experiences and perceptions of the participants. The descriptions offered an inventory of words or phrases to index and categorized the data for the coding process (Saldaña, 2016), thereby revealing themes (Vaismoradi et al., 2016). After the participant reviewed the transcript, and the transcript review checking was finalized, I entered the participants' transcribed responses to the questions; and I hand-coded the interview notes into a Microsoft Excel

spreadsheet. Through triangulation of data and word coding, a broader detection of patterns and increased the study's dependability occurred that drew attention to common relationships across multiple cases (Yin, 2017). The identification of coding categories and their deriving themes facilitated the objective to answering the research question.

I identified five coding categories that included 15 themes from the study's data collection during the data analysis process. The coding categories were (a) effective BI sills for the casual user, (b) SSBI education/training skills for casual users, (c) IT managers' challenges for empowering casual users in SSBI, (d) nature of a successful SSBI initiative, and (e) CSFs for BI systems implementation. The five coding categories were grounded in the conceptual framework: (a) Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users that supports casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060), and (b) Yeoh and Koronios's (2010) The Framework of BI Success, that introduced "an extensive framework identifying the CSFs influencing BI systems success" (p. 25).

Using the manual descriptive coding method, I engaged with the data (Cronin, 2014). It led to a deep involvement in the data, greater insight into the data collection, and a better understanding of the research problem (Finfgeld-Connett, 2014). For this study, I chose to use a manual coding method because of my novice experience as a researcher. I selected the descriptive manual coding method, as described by Saldaña (2016), to analyze the data rather than use Computer Assisted Qualitative Data Analysis

(CAQDAS) programs. Also, a comprehensive data analysis was used for the study: the semistructured interview protocol (the items were designed and standardized by previous researchers), archival data in the form of business reports, industry reports, and media articles on BI (Yin, 2017); and journaling/reflective field notes (Merriam & Tisdell, 2015). Throughout the data collection process, I kept my reflective field notes and used them to reflect on participants' responses during the within-case and cross-case data analysis.

The use of multiple sources of data offered an in-depth understanding of BI experts' views of the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. Archival data added to my journaling/reflective notes in supporting my role as a researcher. As I read through the notes, I continued to strive for objective interpretations to align with the research problem and purpose. The research was an iterative verification process between collecting and analyzing data to answer the research question. The emerging patterns and related categories and themes helped deepen my understanding of the participants' responses within each interview and across interviews. During the iterative process, I found repeating categories and themes that no further coding was necessary to obtain new information (Fusch & Ness, 2015).

I constructed a hierarchal coding frame to organize codes and themes based on how they relate to one another, as is shown below. Five coding categories based on the conceptual framework emerged from three root nodes, and 15 themes were gleaned from the thematic analysis of the coding categories.

Coding Categories

The first root node was the skill characteristics of casual users that included the code category, effective BI-skills for the casual user with the following themes: (a) self-reliance and (b) understand the multidimensional analysis concept.

The second root note was the IT managers goals for successful self-service BI initiatives among casual users that included three coding categories: (a) SSBI education/training skills for casual users, (b) IT managers' challenges for empowering casual users in SSBI, and (c) nature of a successful SSBI-initiative.

The coding category of the SSBI education/training skills for casual users included the following themes: (a) basic statistics/analytics knowledge, (b) IT department training in data management for casual users, and (c) business school training.

The coding category of the IT managers' challenges for empowering casual users in SSBI included the following themes: (a) develop easy to use BI tool and (b) easy to enhance and use BI results.

The coding category of the nature of a successful SSBI-initiative included the following themes: (a) fit for purpose, (b) designed for user-engagement, and (c) user-friendly graphical interface.

The final root note was the defining the CSFs among casual users in the post-implementation stage for successful competitive performance that included the coding category of the CSFs for BI systems implementation with the following themes: (a) continuous training, (b) user satisfaction with participation, (c) casual users belong to the

business team culture, (d) responsive managerial support, and (e) effective organizational communication systems

A brief description of the 15 themes is described below as they emerged from the three root nodes that served as the hierarchical framework during the data analysis.

Self-reliance. This theme describes the effective BI-skills of casual users for decision-making with the understanding of the data context and the BI tool to become problem-solvers ensuring independence and self-sufficiencies, which reduces their need to rely on IT support staff.

Understand the multidimensional analysis concept. This theme describes the effective BI-skills of casual users by exploring the data and asking the right questions for making better decisions, which improves business productivity.

Basic statistics/analytics knowledge. This theme describes casual users' training to enhance business and technical skills when selecting and analyzing data to make informed decisions.

IT department training in data management for casual users. This theme describes the SSBI education from IT departments in organizations for casual users to make decisions by increasing their understanding of SSBI, maintaining BI quality, and supporting users to complete their assigned IS-related tasks successfully.

Business school training. This theme describes the SSBI education from business schools for casual users related to analytics and BI concepts that achieve organizational and personal goals.

Develop easy to use BI tool. This theme describes the IT managers' challenges for empowering casual users in SSBI with work routines, and casual users need to gather data, understand the context of data, and understand the information to perform BI tasks.

Easy to enhance and use BI results. This theme describes IT managers' challenges for empowering casual users in the SSBI to use visual representations of the data for decision-making by providing education, visible data quality, and SSBI reliability that improves productivity.

Fit for purpose. This theme describes the nature of a successful SSBI-initiative designed to meet the casual user's needs by understanding their role and interest in fulfilling organizational goals and aligning the organizational BI strategy.

Designed for user-engagement. This theme describes the nature of a successful SSBI-initiative to develop capabilities to gain the user's attention and increase motivation for interaction with the system.

User-friendly graphical interface. This theme describes the nature of a successful SSBI-initiative that describes how casual users choose, select, or build the visual representation of information needed based on their ability to understand the data and make an accurate decision.

Continuous training. This theme describes CSFs for BI system implementation regarding ongoing training to teach casual users about analytics and system functionality for adoption into work routines and data-driven decisions that require documentation, data correctness, and data governance.

User satisfaction with participation. This theme describes CSFs for BI system implementation to involve the casual user in developing user-focused SSBI initiatives and promoting user acceptance of the SSBI system for successful competitive performance.

Casual users fit to the business team culture. This theme describes CSFs for BI system implementation to understand the casual users' roles and their business processes within a group when developing and using systems to improve organizational performance.

Responsive managerial support. This theme describes CSFs for BI system implementation to guide casual users when they struggle with the SSBI system and maintain system functions for user needs.

Effective organizational communication systems. This theme describes CSFs for BI system implementation to provide a feedback loop between the IT department and casual users with monitoring practices to identify the training needs, system enhancements, and dissemination of information about system upgrades or failures.

With case studies, findings are presented in various styles based on the intended audience, the study's purpose, and type of data analysis (Boyatzis, 1998). Categories and themes by participant quotes are displayed for visual representation in a researcher-generated table to describe the BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage (see Harding, 2018).

As shown in the *Coding Category* section of this chapter, each theme belongs to its corresponding category. Differences occur among the themes with the frequency of

incidences, which present certain cases as more notable than others from the data analysis. In this chapter, further discussion is provided to depict the frequency of occurrence for every theme across the cases in the *Cross-Case Synthesis and Analysis* section with a visual representation graph.

Table 3 below presents the finalized coding categories and themes of this multicase study, along with several examples of participant quotations aligning with each of those categories and themes.

Table 3

Coding and Theme Examples

Participant	Interview excerpt	Coding category	Theme
Participant 1	"I believe casual users sometimes want to do some analysis by themselves rather than relying on a business analyst or the so-called professional analyst." "Casual users have the flexibility to explore with data, and therefore they can come up with a better set of research questions, which is very important for problem-solving and addressing business concerns and other related issues." "For casual users, most of the time, it is explorative testing, so they are curious. They want to try different dimensional analyses and combinations of data sources. It's more like exploratory research." "I believe the most important skill set required by the users should be dimensional database concept. The concept of multidimensionality is very important because BI is an OLAP system online analytical processing system. Unlike the traditional transactional or operational database system, OLAP	Effective BI-skills for the casual user	(a) self-reliance; (b) understand the multidimensional analysis

Participant	Interview excerpt	Coding category	Theme
	or BI system requires a different kind of mindset."		
Participant 2	"It's all about how familiar they are, how comfortable they are, and how good the tool is. In that respect, a tool has to be really designed to allow the casual user to do the work, but at the same time, the tool has to provide for the power users. So basic functionality should be easily accessible. So the learning care is a short, more advanced functionality. It should be for more experienced people that are don't mind looking into it." "Now, I understand what you want to do because, at your end, you probably have the system; you want the users to be more comfortable using it. That's difficult to do from where you are standing because, presumably, the tool that you're using is not as effective as it should be. A tool by itself should attract the casual user to get the job done as fast as possible. So I think your sampling comes right in where the tool does not provide these things, and you want to force the user to cover up for that." "You either ask to collaborate with a provider of a tool to develop the modules necessary for the casual users, or you go ahead and develop the tool yourself, probably through some kind of training, even if the training is virtual or in the form of a help file or some kind of instructions." "They [IT managers] have to ensure that the data have been screened properly. Any erroneous entries have been removed. They have to make sure the data in the data warehouse have been cleaned properly to reflect the actual reality. Well, typically, they're always standards, ISO standards that you can follow to ensure data quality. That's the best you can do is just follow what is recommended out there and make	IT managers' challenges for empowering casual users in SSBI	(a) develop easy to use BI tool; (b) easy to enhance and use BI results

Participant	Interview excerpt	Coding category	Theme
	sure you comply with all those things. There's nothing else you can do, really. Also, make sure that you have a very good team."		
Participant 3	"If it is basic [training] and statistics, then business schools can do it [the education], but since there are so many different tools, it should probably be the IT department that first decides what training is needed and either take people from the company that produced the tools, some consultants or do it [the education] by themselves. Often, it is individuals from IT that first get the training from a BI unit; then, they can teach others. So once the trainer is taught, she can train others. The scenario is casual users definitely need some training with most of these tools. Usually, staff from IT or individuals from BI should know these tools because they probably will also prepare some of the models, and casual users just set parameters. "To be able to create these tools and models, they [individuals from IT or BI] must know the tool themselves. Therefore, they should also be able to teach casual users."	SSBI education/training skills for casual users	(a) basic statistics/analytics knowledge; **(**b**) IT department training in data management for casual users;** **(**c**) business school training**
Participant 4	"If we talk about the role of IT managers, they need to act like a bridge between what the business needs and what the IT or technical oriented people are providing. They need to assume the role of business analysts at a certain stage; they need to interpret the requirements—the needs." "In most of these cases, the feedback group is the users reaching out and asking for this type of resource through the IT manager, and the IT managers' role is to enforce this request and try to understand if there a different way of doing it? Is there a more practical way? From my perspective, the IT manager needs to manage this communication between both [business and technical] sides—this is the feedback loop."	IT managers' challenges for empowering casual users in SSBI	(a) develop easy to use BI tool; (b) easy to enhance and use BI results

Participant	Interview excerpt	Coding category	Theme
	"Another way is they [IT managers] might create some kind of criteria for how to evaluate a data source or how to evaluate if the data is up to a certain standard of quality or not. It may be a comprehensive data model within the organization that does not require the user to clean the data themselves or to access 'dirty data'. That's one way of maintaining the quality."		
Participant 5	"Prepare data to simplify the usage of it." "Be part of the business. I would identify the information need for each department and its users. The focus is to determine the common datasets used when making decisions within each department." "Let the casual users have the ability to change when faults are identified. Faults could be an error within the data. It could be typos and just faulty data numbers etc. [It is] something that is incorrect in the dataset. And let them have the trust to change within the dataset. These users have the best knowledge about the business and should be trusted to change data as desired."	IT managers' challenges for empowering casual users in SSBI	(a) develop easy to use BI tool; (b) easy to enhance and use BI results
Participant 6	"In one of the other questions, we had mentioned turn-key and making sure it's implemented fully and effectively, two—training, three—continuous training and enablement. There's one thing about training somebody on how to use a tool, and there's another thing when I mentioned the power users or SMEs of enabling them in understanding why the tools are important to them." "Diffusion, I will define it as it's defined by Everett Rogers and diffusion of innovation theory in the sense that, and I'll just paraphrase that it's the diffusion of an idea, right? So somebody has an idea, so in this case, it's the SSBI system. We're going to use this SSBI system; a key critical success factor is the acceptance of that system by the	CSFs for BI systems implementation	(a) continuous training; (b) user satisfaction with participation ; (c) casual users belong to the business team culture; (d4) responsive managerial support; (e) effective organizational communication systems

Participant	Interview excerpt	Coding category	Theme
	users, and then three, those users are putting it into practice and actually using it. And then four, they continue to use it into the future, and this [SSBI tool] isn't a, "okay, we get it and turn it on; we train and start using it, then, by the way, we just stopped using it because it's either too hard, too cumbersome."		
	"You don't want somebody that doesn't understand enough about how their specific part of the business functions to be the casual user, or we're being tasked with pulling information and developing reports if they don't really know what's important. They [casual users] even need to be enabled and [to know] what really is important."		
	"I think a lot of that comes down from the top also, so the key stakeholders and leaders within various organizations of, "Hey, here's what our metrics are? Here's what our key functional metrices are, and how we're being measured? How the company's being measured? How are our groups being measured? So, by the way, when we do have our weekly or quarterly or monthly meetings, here are the things that we're going to report on, so the leadership has to drive that behavior. So along with IT, if the leadership doesn't drive that down and they don't identify those things that they say are important, then it's going to be left up to the devices of your average user."		
	"Like I said, in a couple of the other questions from a usability standpoint, having subject-matter-experts sprinkled throughout the organizations helps with that [enablement]. Then, every time there's an upgrade or update, and there are key critical and key updates that happen, whether it's quarterly or every couple of years, or once a year, communication is forthcoming, it's relevant, and it's quick. You don't let the users get		

Participant	Interview excerpt	Coding category	Theme
	blindsided with something that changes the way that they conduct their roles."		
Participant 7	"You do need some background in analytics or statistics, but not in a very professional manner, but basic knowledge. That's what I think, you don't have to be an engineer, but you do need to have some basic statistical and analytical knowledge."	SSBI education/training skills for casual users	(a) **basic statistics/analytics knowledge;** (b) IT department training in data management for casual users; (c) business school training
Participant 8	"I think it [the different levels of self-service BI] makes a huge difference if you are talking about an application scenario where you want to implement or solve analytics with advanced algorithms, like machine learning. There are many examples of [advanced algorithms systems] where you conduct very complex analytics; on the other hand, you may have very simple cases to obtain some key figures from a specific area. That is what I mean." "If the application scenario is very simple, then skills do not have to be very high; but if the scenario is complex with a complex algorithm, then the users not only need information about the data model or of BI tool; they may need mathematics or statistics skills."	Effective BI-skills for the casual user	(a) self-reliance; (b) understand the multidimensional analysis
Participant 9	"From my perspective, it is very important that you develop it all about the fit for purpose, making the SSBI initiative fit for purpose. This means the end-user is not a single entity but multiple, therefore you need to segment the end-users by who they are, and you need to understand who the end-users are, then develop BI systems for those particular classes of users. " "Some people like to spend a lot of time dabbling with data in the BI system and making their own reports; others would like to be able to have a menu of possible reports that they could drag and use for themselves. There is a variety of those [casual users]."	Nature of a successful SSBI-initiative	(a) fit for purpose; (b) designed for user-engagement; (c) user-friendly graphical interface.

Participant	Interview excerpt	Coding category	Theme
	"Flexibility and ease of use for the end-user would accelerate the use of that SSBI, and therefore, it would make it a successful initiative and the most important and overriding principle would be that you have the right data governance of it because, without the governance of a BI system, you will have all sorts of issues."		
Participant 10	"Casual users will always need some support services from time to time. It could be to educate them about data contents and domain knowledge or provide clarification on the underlying data set as well as data displayed by the BI tools." "Adoption Rate of any SSBI toolset must be given serious consideration upfront by engaging with the end-users rather than department managers." "In an era where there are multiple tools available and even casual users have found their own way of downloading data to spreadsheets and come with solutions, thoughts should be given to productivity improvements than tool deployment." "Often, IT departments are eager to deploy newer technology that is pushed by vendors and in-process ignore the potential value for the users and costs of maintaining the legacy and new toolsets." "It is important to keep monitoring activities of SSBI users as to how appropriately and effectively use the BI tools. Inappropriate use might lead them to either misuse the tools, degrade the performance of the BI environment, and even some cases generating incorrect result"	CSFs for BI systems implementation	(a) continuous training; (b) user satisfaction with participation; (c) casual users belong to the business team culture; (d) responsive managerial support; (e) effective organizational communication systems

As previously noted, each of these themes belongs to their respective categories (see Table 3). Some cases are presented with more prominent themes than others caused

by variations in the frequency of occurrence. I will discuss the details and definitions in the *Cross-Case Synthesis and Analysis* section of this chapter. A visual representation graph will be included to illustrate every theme's frequency of occurrence across the cases.

Evidence of Trustworthiness

Credibility

Peer debriefing, member checking, prolonged engagement, knowledge of the issues, negative case analysis and rival explanations, triangulation, and referential adequacy are strategies used for trustworthiness and credible studies (Lincoln & Guba, 1985; Yin, 2017). To verify the interview questions were relevant to answer the research question and meaningful to the participants, I performed field testing with subject-matter-experts. After signing a consent form, I interviewed each participant based on an agreed-upon date and time via Zoom, a video conferencing platform. Each participant was asked if they could interview without interruptions and permission before starting the interview recording. During the interview, they were invited to elaborate on topics where they felt comfortable or decline at any time and request clarification before answering questions. I sent the interview transcript to each of the participants for review via email. Participants had an opportunity to make revisions or changes to ensure the accuracy of the data. This process was defined for the participants to verify and assess transcript results to establish the validity of the results (Birt et al., 2016; Mak-van der Vossen et al., 2019).

Transferability

With interpretive, qualitative research, generalization involving transferability is associated with the setting, researcher's analysis and understanding of the circumstances, and group under study, as context-dependent knowledge (Carminati, 2018; Yin, 2017). During this study, I maintained a constant awareness of my position and reflected upon my potential bias. I accepted that each interview was an opportunity to gather new information and different interpretations. I listened intently to each participant, then ask follow up questions for rich dialogue. A thick description of data was collected and analyzed to contribute to the transferability of the results. Readers may determine the findings' transferability with the in-depth, rich descriptions of collected and analyzed data (Carminati, 2018).

Consistency is needed in the methodology approach and detailed descriptions of the research process and problem to ensure the transferability of the findings (Anderson, 2017; Carminati, 2018; Delmar, 2010). During the analysis, researchers are responsible for developing strategies to ensure the participants retain their voices that allow the readers to decide on the possible transferability of the results (Birt et al., 2016). With thick descriptions, member checking, prolonged engagement, observation, triangulation, member checking, audit trail, and reflexivity, I preserved the participants' voices' meaning and inferences (Houghton et al., 2013). A purposive sampling strategy was used to identify experts as academics and authors of peer-reviewed papers published in reputable scientific journals within the BI subject area indexed on Google Scholar

between 2010 and 2020. It also contributed to the transferability of the results. The sampling included two experts with extensive experience in the field of self-service BI.

Dependability

Dependability refers to researchers applying audit trail, "overlapping methods," such as triangulation, detailed methodological description, and peer debriefing for consistency of the data collection and logical findings that ensures the possible replication with the concurrent use of various strategies and procedures (Merriam & Tisdell, 2015; Morse, 2015). I developed a step-by-step process for the methodology approach during the data collection and analysis, including the activities and detailed descriptions. I created an audit trail to document and describe every action and decision during the data collection process. I denoted significant dates (e.g., initial contact, sent consent form, signed consent form, interview date, interview completed, transcript send, transcript received). I also made notes of decisions that happened throughout the process. The audit trails allowed me to keep track of the progress made while anticipating remaining actions. Along with the audit trails, I maintained the chain of evidence for effective alignment between each step of the research process and associated the results to the research question (Yin, 2017).

Confirmability

Audit trails and researcher reflexivity are strategies that contribute to the confirmability of the study (Berger, 2015; Hasson & Keeney, 2011). To ensure knowledge objectivity, I managed my subjectivity and maintained the detailed descriptions of the expert's responses (Berger, 2015). I aimed to be mindful of my biases

by differentiating between the experts' roles and the researchers' roles, as recommended by Morse (2015). As I created journal entries, I reflected upon the participants' position and their association with other members to safeguard their perspective and interpretation. I also used the self-reflective journals to note my beliefs, assumptions, emotional experiences, and bias, ensuring a transparent data collection process. In the study, each participant reviewed their transcript to check their responses, preventing biases during data collection and analysis.

Study Results

This qualitative, multicase study is framed by two key conceptual models that focus on aligning the study's purpose with the research question to provide answers through an in-depth investigation (Tracy, 2019). The BI experts shared their views and experiences on how to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality so they can complete their assigned IS-related tasks successfully through semistructured interviews. Comprised of both academic and practitioners, the sample of 10 experts responded to the CSFs that may enable casual users to fulfill their SSBI needs in the post-implementation stage in the scope of the SSBI management, the intra-organization and inter-organizational collaboration, such as social, organizational, technological, and informational factors (see Villamarín-García, 2020).

The study's research question that guided the development of the study was the following: How do BI experts describe their views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage?

The multicase study design is used to extract data segments and provide an inventory of words or phrases to index and categorize it (Saldaña, 2016). I used the manual data coding process to analyze the emerging themes and patterns through a two-phased approach: first, the thematic analysis of the textual data, then the cross-case synthesis analysis.

The cross-case synthesis analysis is used to explore the similarities, differences, and themes across cases. A unit of analysis in a cross-case analysis is represented by an entity, an individual, a group, or an event; for this study, it is the BI expert. In a multicase study design, each unit of analysis becomes a case study in and of itself when the individual is the focus of the study (Eisenhardt & Graebner, 2007; Yin, 2017). As recommended by Yin (2017), the data analysis approach involved comparing and contrasting the emerging thematic patterns across cases throughout the data collection process. This iterative, systematic data process, including the development of comprehensive field notes and explanations for each participant's views and experiences in BI, linked these perceptions and experiences to the phenomenon under the study. In the study, the data collection included relevant responses from participants that corresponded to the interview questions, with no issue of irrelevant data.

The data analysis process for this study included a semistructured interview protocol (the items were designed and standardized by previous researchers), archival data in the form of business reports, industry reports, and media articles on BI (Yin, 2017); and journaling/reflective field notes (Merriam & Tisdell, 2015). During data collection and analysis, transcript review and audit trails were used for the study. I

gathered evidence from multiple sources with the use of various data collection methods for triangulation purposes. The data analysis process consisted of a cross-case analysis to determine whether the case studies were comparable by analyzing the convergence and divergence of the collected data (Yin, 2017).

Each of the cases provided evidence to describe BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. During the analysis, emerging themes were categorized, and the findings were cross-referenced in a tabular format generated by the researcher for a visual representation of the participants' quotes. Using this approach, it constituted the groundwork for the cross-case analysis and the data synthesis technique that involved treating each case separately while aggregating findings across a series of individual cases, as well as strengthening the robustness of the study's results (Eisenhardt & Graebner, 2007; Yin, 2017).

When using a multicase study design, it is crucial to apply a consistent procedure during the data collection and analysis, allowing for a standardized platform for cross-case comparisons and the thematic analysis (Yin, 2017). The same technique was used to collect data from the 10 participants in this study, although two participants opted to provide written answers using the same interview protocol.

Participants who interviewed for the study also received a transcript to review their responses. The participant who provided written responses spent the time considering their responses and responded to follow-up questions, allowing for a readjustment of the 10 participants' data collection process. Because consistency is important, it was also applied when hand-coding the collected data during the data

analysis to categorize and identify the emerging themes across the 10 cases. This study's data analysis involved two stages: first, a within-case analysis of each of the selected cases, then a cross-case analysis of the data to find similarities and differences across the categories and themes (Yin, 2017).

First Phase: Thematic Analysis of the Textual Data

The data analysis occurred in a series of steps to ensure the trustworthiness of the thematic analysis (Nowell et al., 2017). Nowell et al. (2017) recommended the step-by-step approach because the concurrent data collection and analysis may affect the results' robustness. The results are presented with objectivity and logic, illustrating the data collection and analysis; it also provides the study's dependability and credibility. This study includes direct short and long quotes collected from participants as part of the thematic analysis approach (King, 2004). The direct short quotes addressed specific points of the questions; long quotes allowed for a complete understanding of the participants' explanations, enabling them to maintain their voice. In thematic data analysis, the transition is essential from raw data to a robust analysis of data for meeting the criteria of trustworthiness (Braun & Clarke, 2006).

The presentation of the analyzed themes is below. The themes emerged from the data collection relating to the research question:

Self-reliance

This theme refers to the characteristics of the casual user with data needs for decision making and limited knowledge of the complex data relationships and access to data resources, becoming more independent to make decisions and less dependent on the

IT organization. Casual users must have the capacity to access, gather, and understand data to conduct the own analysis and proactively make informed decisions, which reduces the need for IT support and improves business efficiency (Imhoff & White, 2011).

Participants discussed the challenges for casual users to independently explore and manage various data sources with an appropriate analytical skill level and the use of the SSBI to make better decisions. Four participants found the SSBI tool to be an important factor for self-reliance. Many of the participants described the characteristics of casual users. Participant 3 defined effective BI skills "as part of their job (20-30%) to analyze data" to be an effective casual user, while those users who use the "tools once in a blue moon, it will not work". Other participants described their interactions with the BI systems; Participant 9 referred to casual users as "data consumers; therefore, they use the data for decision making". Casual users are empowered to use the BI tool and explore the data for decision making when they gain BI competencies that promote self-reliance.

Understand the Multidimensional Analysis Concept

This theme refers to the casual user's characteristics to process and manipulate the data for final analysis to increase their understanding of selecting and exploring information when asking questions and making decisions, which improves business productivity. Casual users must acquire technical knowledge for data literacy, data quality, and report management to visualize resulting information from various viewpoints and ensuring appropriate decisions (Berndtsson et al., 2019).

Participants discussed the challenges for casual users to effectively use the SSBI and understand the information when addressing business problems. Participants discussed the need for casual users to understand how to retrieve and interpret data from the SSBI. The analytical process is complex, as Participant 4 described, “gathering data, processing this data, analyzing the data, producing information, and visualizing [the information]” and “ the more complex the task is, the more capabilities the user should possess”. Three of the participants discussed a method to measure user capabilities for gaining information to make decisions with the SSBI use. Casual users need to understand how to obtain data and “ [progress deeper into the analytics]. [As the analytics increases], it may be more challenging to get the relevant data; and then skills have more influence on effective use because you have to know where are the data. How are they [data] stored? How can I connect them?”. The casual users need knowledge of the data structure and data layout of the BI tool to analyze information effectively.

Basic Statistics/Analytics Knowledge

This theme describes casual users' training to enhance business and technical skills when selecting and analyzing data to make informed decisions. The knowledge of median, filtering, percentages, or advanced statistical analysis of variance and regression testing is often required for casual users' analytical tasks. Limited awareness of the data terms, data linkage associations, database structures, and data storage can increase their frustration and confusion to perform analytical tasks, reducing their ability to organize data in meaningful reports (Bani-Hani et al., 2019; Schlesinger & Rahman, 2016).

Participants discussed casual users' educational need for general statistics, and database concepts for understanding the SSBI output. Many participants included statistics and analytical knowledge for users when developing reports and understanding the information to make decisions. Participant 3 suggested casual users need to have "some basic understanding of statistics," as it relates "to the job so they have a good understanding of what data are available in the company because this [understanding] is a key to be able to analyze them [data] and interpret the meaning". Participants provided further explanations related to aligning the technical aspects of the SSBI tool with the users' business skills; others discussed basic education for empowering the user to fulfill their role within the organization. As Participant 4 explained, individuals need "to be independent and self-reliant, first, you need to be able to know how to operate the environment you are in and the different tools". Participant 2 provided a general statement on skills for success that "it starts in kindergarten. As a casual user, he moves on to an elementary, high school, and education continues" to become an independent learner. Casual users obtain education from many sources to enhance their personal and technical capabilities that improve their performance.

IT Department Training in Data Management for Casual Users

This theme refers to the SSBI education from IT departments within organizations for casual users for managing the business–IT alignment to ensure data quality and appropriate SSBI users' access. IT managers need to consider the strategies and data governance for training and support for casual users to maintain data consistency, data quality, and appropriate user access (Berndtsson et al., 2019, 2020).

Participants discussed the IT management training required for users to effectively use technology by coving topics like data structures and data modeling. Technology is constantly changing, as Participant 2 stated, “Sometimes that in itself is something that we have not experienced in human history before—new knowledge collects so fast that even the IT people have difficulty catching up”. Often, IT departments concentrate on the technology of the organization and “focus on the skills of the moment that the technology is dealing with at that particular moment”. Five participants stated that education was a joint effort to meet the needs of the users. Participant 8 suggested “ it can be difficult [to determine if business schools or IT departments meet the criteria for training] because some aspects of SSBI are general, which can be done by either business schools or IT management, like data management, while some aspects are specific to organizations [and suitable for IT departments]. IT departments seek to focus their efforts and resources to support the organizational goals and casual users through the data management and governance of the BI system and implementation.

Business School Training

This theme refers to SSBI education from business schools for casual users related to analytics and BI concepts that achieve organizational and personal goals. Training for casual users is focused on describing a basic understanding of the SSBI, and the nontechnical aspects, such as the meaning of the data elements, generating useful reports for decision making, sharing information, and governance (Berndtsson et al., 2020).

Participants discussed the core concepts of the business school curriculum. Many participants agreed on the overlap of education between business schools and IT departments. A few participants preferred SSBI training from business schools, suggesting the business programs provided an overview of education that focused on business functions with Participant 4 stating that “business schools, are key factors in this education because they are not only teaching the value of such [BI] systems, but they talk more about the theories and what is behind adopting such an approach to data analytics”. Several participants discussed the challenges for business schools in training casual users as they enter the workforce; Participant 9 recommended that “business schools need to make users familiar with as many tools as possible, especially the tools that relate to industry trends.”. All participants suggested that alignment must occur between business schools and IT departments.

Develop Easy to Use BI tool

This theme describes the IT managers’ challenges for empowering casual users in SSBI in aligning the organizational BI strategy with the user work routines to enhance analytical capabilities and improve decision making. IT managers must prepare organizations and casual users for SSBI initiatives, develop effective data management and data governance policies to control data access, and identify user interfaces' requirements by understanding user experiences, needs, and workflow (Lennerholt et al., 2018).

Participants discussed the challenges of developing the SSBI to develop a system for supporting casual user needs. Many of the participants focused on gathering

information from users and promoting the benefits of the system. Several participants discussed the feedback loops from casual users to encourage BI use: Participant 1 stated that “you get their feedback, then implement their feedback and then get them to test as well. That kind of a positive loop, positive learning, so the users will feel satisfied, and they know that the system is there to help them, enabling them to better analyze the business problems”. With the support of IT managers, user requirements can be better understood to develop BI tools. Participant 9 described the purpose of IT managers “to make sure the BI system delivers data accurately and consistently, and people are accessing BI systems with certain authority and privileges—the user privileges to access [a BI system] and only that [BI system], rather than being able to access any others. Participants also expressed the importance of cleaning and maintaining data for data accuracy and preparing the users for their interactions with technology.

Easy to Enhance and Use BI results

This theme refers to IT managers’ challenges for enabling casual users to gather and understand information for improved decisions with complete and accurate data stored in the SSBI to improve productivity. IT managers must provide casual users with flexible and adaptable SSBI tools for building reports and dashboards effectively and efficiently and training to understand accurate information and make better decisions, reducing the need for IT support (Lennerholt et al., 2018).

Participants discussed challenges for developing suitable SSBI system architecture, quality controls, and documentation to maintain accurate data for user retrieval and educating users on data quality to support their decision making. Other

participants discussed casual user involvement with data correction, as Participant 5 stated, “let the casual users have the ability to change when faults are identified. Faults could be an error within the data”. Many participants discussed data quality as either a technology problem or a business problem to ensure the organization's data integrity. Participant 1 suggested that “IT managers can provide in this context is to ensure that the corporate systems' SSBI tool is extracting information from [the right data sources] and it's doing it correctly, as well as it's pulling the right information, and what is in the repository, during the [storage in the] databases, is actually audited and cleaned on a regular basis to ensure that the quality of the data is accurate.” Often, data integration problems and inaccuracy of data are caused by data integration process, but problems are also produced “if the users define the parameters, joins, and filters incorrectly that cause data quality issues even though the right data is sitting in the underlying repository or database tables” as stated by Participant 10. The casual user understanding and perception of BI system are important to render accurate results in the effective use of the tool.

Fit For Purpose

This theme refers to the nature of a successful SSBI-initiative designed to meet the casual user's needs by understanding their role and interest in fulfilling organizational goals. The SSBI tool is adjusted to fit the skills and the user's role, allowing for the appropriate flexibility and control for accessing data according to the business function (Alpar & Schulz, 2016).

Participants discussed the design of the SSBI based on the role of the users to complete tasks successfully. As stated by Participant 8, “the business problem is really the BI tool, a business problem solver, or as an enabler to really improve the decision-making process to support a business” to help the users complete their tasks. The BI tool is designed for various roles of the users, and “the value is going to be different, whether you're in sales operations, if you're in marketing, if you're in product management, if you're in a supply chain, if you're in manufacturing, or if you're in sales, so things are going to be used differently for different reasons” as suggested by Participant 6. Casual users have different analytical needs when using the SSBI tool and benefit when the tool is built for their tasks, so they must recognize the importance of focusing on the users and their experiences.

Designed for User-Engagement

This theme refers to a successful SSBI-initiative by developing capabilities to gain the user’s attention and increase motivation for interaction with the system. In SSBI environments, independence and self-efficacy are the motivation that drives casual users to explore and exploit the availability of data sources (Bani-Hani, Tona et al., 2018). Individuals adopt SSBI when they perceive that they can control and direct the outcome, which increases confidence (Blut et al., 2016).

Participants discussed the drag and drop menus and visually appealing characteristics for encouraging casual users to gain more information from SSBI use. Participants discussed the importance of engaging the casual users and the challenges of measuring business results with the effective BI use from casual users: Participant 3

described the difficulty to determine if “business results getting better because people are using the data, and this is BI, but that is usually more difficult to measure than how many casual users are using some software”. The SSBI features and functions are reasons the users want to gather information for making decisions. The BI tools are improving by adding “techniques to try and preempt what a particular class of users might want. It is the "unknown unknowns" that you didn't think to ask that question” , as stated by Participant 9. The BI tool engages casual users by anticipating the users' needs. Many of the participants mentioned evaluating the use of SSBI by casual users to determine the amount of their engagement and empowering the users to focus on business problems.

User-Friendly Graphical Nature of a Successful SSBI-Initiative Interface

This theme refers to a successful SSBI-initiative that describes how casual users choose, select, or build the visual representation of information needed to understand the data and decide on a report or dashboard that visualizes the underlying data required decision. Guidelines can be used for the dimensional view of data for users to understand and learn from the data in a report to grasp more successful concepts of data tables, joins, and filtering, as well as the ad hoc querying technique itself to make an informed decision (Vujošević et al., 2019).

Participants discussed the challenges of creating an interface that appeals to the user “who have limited analytical skills, so what is considered a successful assessment initiative is that it should be user friendly. User friendly means that the user interface is intuitive”, as stated by Participant 1. They also discussed the BI functionality for “usability of a platform that the users working experience or the usability of the software

or platform for getting those users as comfortable as humanly possible with the system", as discussed by Participant 6, for users to interact with the BI tool and retrieve information to make accurate decisions.

Continuous Training

This theme refers to CSFs for BI system implementation regarding ongoing training to teach casual users about analytics and system functionality for adoption into work routines and data-driven decisions. As a critical factor for success, casual users need proper training to maintain their interest in SSBI use while understanding the reasons for the SSBI implementation and the implications to their work routine (Lennerholt et al., 2020).

Participants described training to learn the software, interpret datasets, and understand SSBI in general for new and current casual users. The ongoing training program is important for casual users " to maintain this chain of education within an organization, the feedback loop", as stated by Participant 4, for retaining analytical knowledge and supporting their independence to complete tasks. Many participants suggested that training also requires users' feedback to ensure the information is beneficial. The training covered topics such as data governance, data quality, data storage, and data retrieval. In the post-implementation stage, training is a process for user adoption; Participant 10 stated that training is a mechanism for "making the system easy to use, aware of its capabilities, and therefore all of those are very much around training". Four participants discussed training to improve casual users' understanding of the SSBI value and long-term SSBI use. Two participants discussed online and in-person training

methods to ensure all casual users receive education for improving analytical skills and SSBI use.

User Satisfaction With Participation

This theme refers to the CSFs for BI system implementation to involve the casual user in developing user-focused SSBI initiatives and promoting user acceptance of the SSBI system for successful competitive performance. User participation can contribute throughout the BI initiative to a better understanding of their needs and provide valuable input about the business requirements (Yeoh & Koronios, 2010; Yeoh & Popovič, 2016).

Participants discussed user involvement to capture the business processes for identifying SSBI requirements and training. One critical success factor involves meeting the casual user's expectation; as Participant 1 stated, "user involvement starts from day one, user participation, so you can see everything is about the users and, at the same time, about the business". User participation occurs throughout the development, implementation, and adoption of the SSBI to ensure the tool meets casual users' needs and to incorporate the user requirements and needs into the SSBI tool. Measurement of satisfaction is often determined by the use of the BI system, as " time of using the system" (Participant 2) and user satisfaction. User satisfaction can be measured in several ways "through surveys or whatever you have available. You can look at the complaints, another KPI, and see if they go up or down and how they are treated, so you know how the system performs. Recommendations that the users will provide" (Participant 2). Many participants discussed that user satisfaction improved when they participated or became involved with the BI initiative.

Casual Users Belong to the Business Team Culture

This theme refers to BI system implementation's CSFs to understand the casual users' roles and their business processes within a group when developing and using systems to improve organizational performance. Uncertainties exist with casual users during the SSBI implementations when they experience changes to their work routine, social relationships, and organizational goals, influencing user acceptance (Weiler, Matt et al., 2019). Participants discussed the characteristics of casual users' roles within the business area of an organization. Many of the participants described the variations in the frequency of use of the BI tools from casual users that limit their analytical skills. The team of casual users must have the ability to analyze data; therefore, the team may include "a professional, casual user, at least one who spends a lot of time, whether you call them citizen data scientist or casual users (Participant 3). In an organization, casual users need "to be part of the business, not to separate islands of IT and business" (Participant, 5). Many of the participants presented job descriptions of business roles or examples of business problems.

Responsive Managerial Support

This theme refers to BI system implementation's CSFs to guide casual users when they struggle with the SSBI system and maintain system functions for user needs. Management support is committed and consistent with maintaining a clear vision of a BI system, facilitating communication, addressing data quality, and identifying end-user needs (Yeoh & Koronios, 2010; Yeoh & Popovič, 2016).

Participants discussed the management support of enabling casual users to use the SSBI by providing direction and leadership. Many participants suggested that management strategies for support can help users to understand the BI tool and to make themselves accessible for questions or concerns, as Participant 8 stated, “the two things: being available, and on the other side, giving some guidelines for analytics by delivering and providing sample applications, so they [casual users] are well informed and gain an understanding of analytics and the SSBI application to achieve their need”, Casual users supporting themselves do not promote effective use of the BI tools, but a top down approach of management support delivers better service for allocating limited resources and delegating responsibilities; Participant 4 suggested that “we can not assume this need to be self serve comes from the bottom if everybody is comfortable with the technical support they have”.

Effective Organizational Communication Systems

This theme refers to BI system implementation's CSFs to establish communication modes between the IT department and casual users with monitoring practices when transferring information about training needs, system enhancements, and system upgrades or failures. With the use of communication strategies, IT management can inform all casual users of workflow or work routine changes to reduce user resistance and increase SSBI adoption (Laumer, Maier, Echardt et al., 2016). Participants discussed the transfer of information between casual users and IT managers to understand the SSBI capabilities and use. Communication between the IT management and casual users is important; many of the participants suggested that casual users need to have an

“understanding of the capabilities and how to use it and therefore made aware of having a mechanism to receive feedback” (Participant 9). Casual users are informed of changes and benefits of the system, as Participant 7 stated, “You should show them [casual users] the advantage of such systems and that fear and fear of using it, fear of what happens with their job after the system is implemented, so it doesn't come up [in the post-implementation stage]. The communication system is used to transfer information to casual users to better understand their work routine and reduce fear, while IT managers can better understand the casual user needs and requirements.

Second Phase: Cross-Case Synthesis and Analysis

For this study, I applied the cross-case synthesis and analysis technique across the 10 cases to organize the 15 themes (Yin, 2017). I employed the use of Word tables to find patterns among the cases in the small sample, rather than meta-analysis used for large samples of cases (Yin, 2017). With the complexity of real-life experiences and the potential for hidden patterns in the textual data, the use of the cross-case synthesis method supported the data analysis process, in addition to the thematic analysis technique, ensuring the transferability and trustworthiness of the results (Eisenhardt, 1989; Yin, 2017). I developed an evidence-based argument based on the comprehensive analysis, framed by two key conceptual models, and aligned with the purpose of the study (Cooper & White, 2012; Yin, 2017).

The cross-case analysis technique was used for each of the 10 cases in a separate analysis involving an iterative data analysis process. Combining the two techniques, patterns, and themes emerged for exploring participants’ views about the CSFs needed

for SSBI initiatives among casual users in the post-implementation stage. As recommended by Yin (2017), the cross-case synthesis technique explores the convergence and divergence of data between cases while removing unrelated data from the analysis.

The cumulative frequencies of each theme by occurrence are the thematic analysis results from each case, as shown in Figure 1. The reader is provided with a visual representation of those themes that converged to answer the research question.

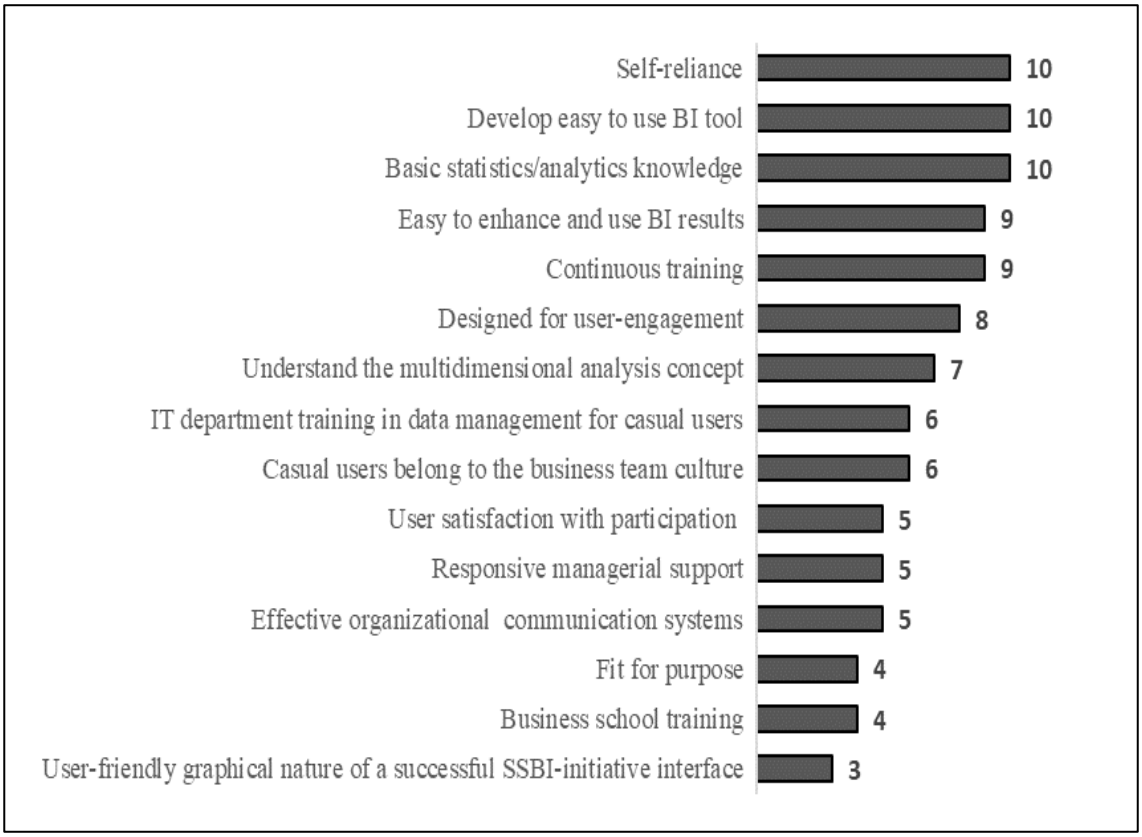

Figure 1. Multicase analysis (theme frequency of occurrence by participant)

In an iterative process, I initially used cross-case analysis for a separate analysis of each case, 10 cases in total. As I analyzed the cases to meet the study's purpose, themes recurred across the data to gain a deeper understanding of BI expert's views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. As shown in Figure 1, the graph illustrates the cumulative frequencies of occurrence for each theme from the expert interviews. I combined the data analysis from each case while analyzing the convergent and divergent data across the 10 cases; the graph represents the multicase study's cross-case synthesis results.

Expert interviews can provide a foundation in a modern or insufficiently defined field for qualitative and quantitative research projects. With their insight, researchers obtain information to develop a better understanding of problems. As part of the study's design, the exploratory expert interviews were used to gather data and generate recommendations for practice and research, detailed in Chapter 5. In the study, the expert's role is someone possessing contextual, technical, and process knowledge. With expert and elite interviews, interpretative knowledge is the explorative function of this study (Littig & Pöchhacker, 2014). I explored interview data that contained orientations, interpretations, and evaluations, gaining an impression of the field for further theoretical research.

The open nature of expert views allows for the interpretative knowledge of participants' orientation and beliefs using thematically focused narratives of theory-extending interviews (Van Audenhove & Donders, 2019). The exploratory interviews should be conducted with open discussions, as feasibly possible, with experts and elites

to gather an unforeseen breadth of information and interpretations. With expert interviews, the goal is a permanent revision of the topic guide for this research (Witzel & Reiter, 2012). It is advancing the body of knowledge on the user competency of the casual user within the SSBI management field for the success of SSBI implementation in increasing knowledge about CSFs for IT managers (Villamarín-García, 2020; Yeoh & Popovič, 2016). Since data-driven cultures occur at all organizational levels, IT managers may benefit from recognizing the role the CSFs plays in building BI teams of casual users who do not struggle with data accuracy and data-driven decision making (Aminy et al., 2019).

For successful SSBI at the post-implementation stage, scholars recommended that more research is needed to train IT managers about the nontechnical and technical elements of CSFs for BI implementation among casual user staff. With a different perspective, Villamarín-García (2020) proposed that BI success is associated with organizational collaboration to reduce uncertainty and improve business processes and suggested the expert's use of CSFs meanings is an approach to understand BI success from both an organizational and economic perspective. Updated empirical research is needed based on BI experts' guidance on which CSFs may enable casual users to fulfill their SSBI needs in the post-implementation stage (Aminy et al., 2019; Berndtsson et al., 2020).

Researchers conduct expert or elite interviews with various approaches without a standard procedure for data analysis (Flick, 2018). In social research, scholars accept the principle that all qualitative methods can be applied for data analysis; for example, code-

based procedures are standard for a thematic analysis of a data collection (Bogner et al., 2018). For this study, my interpretive narrative will be based on the combination of frequency, at least eight out of the 10 cases, of expert-generated themes by occurrence (Rosenthal, 2018). The results are implications for the study and recommendations for further research in Chapter 5. Five coding categories figured prominently across the data collected from all 10 cases: (a) effective BI-skills for the casual user, (b) SSBI education/training skills for casual users, (c) IT managers' challenges for empowering casual users in SSBI, nature of a successful SSBI-initiative, and (d) CSFs for BI systems implementation. Four themes figured prominently across eight out of the 10 cases: (a) self-reliance, (b) basic statistics/analytics knowledge, (b) develop easy to use BI tool, and (c) easy to enhance and use BI results.

Eight out of 10 BI experts presented information for educating casual users for SSBI use to encourage independence and empowerment, which reduces the need for IT support and improves business efficiency. They suggested that casual users organize data in a meaningful report and conduct their analysis to make informed decisions. These experts also stressed the importance of maintaining data for data accuracy, as well as and preparing the users for their interactions with technology for user retrieval and educating users on data quality to support their decision making.

Triangulation

I used three sources of data throughout this study: (a) interviews conducted using a semistructured interview protocol (Appendix A) with items that had been designed and standardized by previous researchers; (b) archival data in the form of practitioner-based

BI reports (Yin, 2017); and (c) journaling/reflective field notes (Merriam & Tisdell, 2015) kept by the researcher throughout the data collection process. When applying triangulation, various methods are used to collect data from various sources for evidence. During data analysis, the codes are emerged into themes across various methodologies and connect the data sources, including interviews, field notes, historical literature, and archival data (Stake, 2013). For this study, triangulation was used to enhance the results' trustworthiness and develop a comprehensive understanding of the data (Yin, 2017).

Aligning with the research question and constructivist paradigm, I used observation as an additional data source for collection, maintaining reflective field notes, as unstructured observations (Katz, 2015). Qualitative researchers often use journaling and reflective field notes in case study research (Merriam & Tisdell, 2015; Stake, 2013). In previous organizational studies, reflexivity has become a significant aspect of qualitative research methods (Haynes, 2012). Reflexivity is also a critical component of data analysis for the case study design in management research (Stake, 2013). During the data analysis, I mitigated the reflexivity-generated subjectivity by maintaining the participants' voices and gaining a comprehensive understanding of the different sources of evidence, which protects the trustworthiness of the data (Alvesson & Sköldberg, 2017). I prepared and sent each participant their interview transcript with a request to read and verify the accuracy of their responses; the member checking transcript was also helpful for assessing the researcher's reflexivity (Merriam & Tisdell, 2015).

An interview protocol was used for the semistructured interviews, and an approach to standardize the data collection process (see Appendix A). The study is

documented by an audit trail, a synthesis of reports for the transcripts, coding structure, and memos on the research's progress. During the study, I employed triangulation across the data sources and maintained an audit trail to ensure the dependability of the results (Guion et al., 2011). For the data analysis, I conducted data triangulation to find patterns or contrasts between sources by referencing my reflective journal notes and analyzed archival data.

Triangulation is an analytic method and a central feature of the case study design for validating qualitative data during data analysis and fieldwork, such as the interviews and other sources of evidence (Yin, 2017). As recommended by Halkias and Neubert (2020) and Yin (2017), I chose data triangulation to mitigate problems relating to validity; for example, multiple sources of data offered a different measure for a phenomenon, and numerous strategies of data analysis existed for multiple sources (e.g., investigating opposing, explanations case description, analytic techniques to compare proposed relationships with empirical patterns). In the archival data set, pattern-matching logic was applied to compare empirically and predicted patterns, which aligned with the data analysis for the primary data (e.g., cross-case synthesis, explanation building, and logic models).

After concluding the semistructured interviews with the participants, I resumed the data analysis process with data triangulation. During the literature review, I annotated peer-reviewed scholarly papers from 99 scientific journals. I also collected and reviewed 144 articles that included government, business, company, media reports, white papers, and popular media (newspaper, a magazine). Out of these articles, the reports were

complementary literature sources for knowledge about my topic, not foundational or seminal research. With the reports from the literature review, I became more informed on SSBI and BI, which reduced my subjectivity, helping me find the meaning of recurring concepts and ideas for themes to ensure completeness, accuracy, and credibility (Fusch & Ness, 2015).

The archival data information was in the form of ***business, industry, and media reports*** on innovative trends in BI management from the respected industry and business sources such as TechTarget Network, Transforming Data with Intelligence (TDWI). Media reports were also presented from the Offshore Technology Conference. The reports are complementary evidence for the study supporting the primary source of data, semistructured interviews, without the entry of citations in the literature review. I concluded archival data analysis through additional evidence yielding in-depth, rich information for methodological triangulation to answer the research question (Guion et al., 2011). In this study, three data sources were triangulated to provide in-depth, rich information to support a trustworthy study (Guion et al., 2011; Yin, 2017). By analyzing the triangulated results through the lens of my conceptual framework, the study's findings can extend the body of knowledge related to BI management experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.

Summary and Transition

In this chapter, I presented a case by case analysis of 10 participants, followed by a cross-case analysis and synthesis to answer this study's research question: How do BI experts describe their views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage? This multicase study showed the participants' insights and expert experiences, which emerged from the data analysis and can be attributed to the related themes and patterns presented in the study results.

The data analysis techniques to yield the study's results were produced in this section in a two-step procedure: (a) thematic analysis of the textual data and (b) cross-case synthesis analysis (see Yin, 2017). A total of five codes emerged from the findings of this multicase study, which included a total of 15 themes. These provided rich data on the experiences of participants. The five codes that emerged are (a) effective BI-skills for the casual user, (b) SSBI education/training skills for casual users, (c) IT managers' challenges for empowering casual users in SSBI, (d) nature of a successful SSBI-initiative, and (e) CSFs for BI systems implementation

I applied a cross-case analysis and synthesis as a data analysis technique in the study to combine essential findings from each case study as soon as themes across multiple cases were arranged. The 15 themes that emerged from the data analysis process include (a) self-reliance, (b) understand the multidimensional analysis concept, (c) basic statistics/analytics knowledge, (d) IT department training in data management for casual users, (e) business school training, (f) develop easy to use BI tool, (g) easy to enhance and use BI results, (h) fit for purpose, (i) designed for user-engagement, (j) user-friendly

graphical nature of a successful SSBI-initiative interface, (k) continuous training, (l) user satisfaction with participation, (m) casual users belong to the business team culture, (n) responsive managerial support, and (o) effective organizational communication systems

Augmenting the binding data source, I enhanced the study's data trustworthiness by employing methodological triangulation of three data sources, which included a semistructured interview protocol, archival data in the form of practitioner-based BI reports (see Yin, 2017), and reflective field notes (Merriam & Grenier, 2019). The multicase study results were further analyzed and interpreted within the context of the conceptual framework: (a) Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users that supports casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060), and (b) Yeoh and Koronios' (2010) The Framework of BI Success, that introduced "an extensive framework identifying the CSFs influencing BI systems success" (p. 25). Previous scholars suggested that IT management's challenges for SSBI success confront organizations concerning the support of the self-reliant casual users for sustainability and competitive advantages in a global economy (Hartmann & Lussier, 2020; Lennerholt et al., 2018).

The purpose of this qualitative, multicase study was to describe BI experts' views on the CSFs that contribute to the success of SSBI initiatives among casual users in the post-implementation stage. This study may be significant to theory and extend academic knowledge in guiding casual users to expand their analytics capabilities, increase their

understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) through subject-matter-experts' views.

I will present an interpretation of this study's findings in Chapter 5, in contrast to the literature review in Chapter 2 of this document. The implication of the findings to social change, theory, practice, and policy will also be detailed in Chapter 5. I will also explain how my study extends the body of knowledge on BI managerial strategies for driving successful strategic change initiatives. Finally, I will describe how the research community can extend the findings of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative, multicase study was to describes BI experts' guidance for IT managers on CSFs for successful SSBI use among causal users in the post-implementation stage. To address the research problem and purpose of the study, I used qualitative data collected from multiple sources of evidence, including interviews, archival data in the form of practitioner-based BI reports, and reflective journaling notes (Merriam & Tisdell, 2015). Triangulation of data sources was performed to establish the trustworthiness of the data analysis (Guion et al., 2011; Merriam & Tisdell, 2015). Using a qualitative approach, I gathered data that reflected on the perceptions shared by participants in the study on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage.The interviews allowed them to elaborate of their personal experiences and on the emergence of unexpected data (Jacob & Furgerson, 2012).

A qualitative, multicase study approach allowed me to give BI experts a voice on the specific CSFs that enable casual users to fulfill their SSBI needs in the post-implementation stage. The research design and approach of this study were grounded in the study's conceptual framework, which was built on two conceptual models that aligned with the purpose of the study. Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users, supports that casual users be given "the flexibility to choose, use and manipulate the data they need, as well as the support required to understand the underlying algorithms…to make better decisions on time, which improves business productivity" (p. 5060). Yeoh and Koronios' (2010) The Framework of BI Success, introduced "an extensive framework identifying the CSFs

influencing BI systems success" (p. 25). SSBI research is a topic of interest with opportunities to extend existing models and inform the IT management practices of the challenges with SSBI initiatives (Aminy et al., 2019; Blut et al., 2016; Yeoh & Koronios, 2010). This study may be significant to theory and extend academic knowledge in guiding casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) based on the views of subject-matter-experts.

In this and other studies, limited knowledge was available for IT managers with which to guide casual users'expansion of their analytics capabilities, increasing of their understanding of SSBI, and maintenance of BI quality so they could complete their assigned IS-related tasks successfully (Berndtsson et al., 2019). Using a multicase study approach was particularly useful in this study because it gave me the flexibility I needed to replicate and extend a theoretical model (Halkias & Neubert, 2020; Stake, 2006). New knowledge emerges by identifying patterns in the collected data and the logical arguments that support them (Eisenhardt & Graebner, 2007).

Thematic analysis and cross-case synthesis and analysis of data from face-to-face interviews with nine participants revealed the following 15 themes: (a) self-reliance, (b) understanding the multidimensional analysis concept, (c) basic statistics/analytics knowledge, (d) IT department training in data management for casual users, (e) business school training, (f) develop easy to use BI tool, (g) easy to enhance and use BI results, (h) fit for purpose, (i) designed for user-engagement, (j) user-friendly graphical nature of a successful SSBI-initiative interface, (k) continuous training, (l) user satisfaction with

participation, (m) casual users belonging to the business team culture, (n) responsive managerial support, and (o) effective organizational communication systems.

Interpretation of Findings

This multicase study's findings confirmed or extended current knowledge in the BI discipline, with each case offering examples of issues discussed in the literature review. In this section, the study's findings are presented and reviewed in the context of the five coding categories that emerged from the data analysis: (a) effective BI-skills for the casual user, (b) SSBI education/training skills for casual users, (c) IT managers' challenges for empowering casual users in SSBI, (d) nature of a successful SSBI-initiative, and (e) CSFs for BI systems implementation. As I reviewed the data, I compare each of these categories with relevant concepts from the conceptual framework and the extant literature reviewed in Chapter 2. I provide evidence from the nine semistructured interviews to support how the study's findings confirm, disconfirm, or extend existing knowledge. In a multicase study, the process of analyzing and presenting data evidence for theory extension demonstrates the complexity of responding to the inductive and deductive evaluation process of qualitative data (Halkias & Neubert, 2020). This multicase study is also an extension study that provides replication evidence and supports the extension of prior research results by offering valuable insights and new theoretical directions (see Bonett, 2012).

Effective BI-Skills for the Casual User

The study results confirmed scholars' viewpoints that IT managers must how casual users with the organization should work with the SSBI tools to expand their

analytics capabilities, increase their understanding of SSBI, and maintain BI quality. Casual users within a business organization need problem-solving skills, communication skills, and the ability to perform analysis with data from dashboards, reports, or possibly complex data models. Results of the study align with research literature as notated by Alpar and Schulz (2016), which states in order for casual users to achieve self-reliance, they must be empowered to move from potential misuse of data to knowledge exploration of information, reducing their need for IT support. Furthermore, Bani-Hani et al. (2019) stated that the empowerment of the casual users requires a certain level of knowledge, business understanding, experience, and competencies to use the BI tool during different analytic processes to complete tasks (Bani-Hani et al., 2019).

Participants from the study confirmed that self-reliance was a central theme; casual users' various skill levels and involvement contributed to the theme's conversation. As noted by Bani-Hani et al. (2019), the casual users' interactions with the SSBI have different engagement levels to gather, organize, and interpret information without assistance from IT, support staff. Multiple participants mentioned the process of gathering and preparing data sources with the SSBI tool and the appropriate analytical skill level for answering the right question. Participants in the study emphasized the importance of users exploring the SSBI to gain insight from gathering information and answering relevant questions. The study results extend knowledge on the works of Aminy et al. (2019) and Alpar and Schulz (2016) on how the role and skills of the casual users impact SSBI use.

SSBI Education/Training Skills for Casual Users

The study results confirmed scholars' viewpoints that IT managers must consider casual users' educational needs to understand their business functions and complete analytical tasks with the SSBI tool. Training included general business, statistics, life skills, and database concepts to help ensure casual users become self-sufficient for completing tasks with the SSBI tool. Results of the study align with research literature as notated by Berndtsson et al. (2019), which states in order for the organization to proceed with the SSBI initiative, it is essential to train and educate every person, so they can derive meaningful insight from data for making data-driven decisions relevant to their work routines. Furthermore, Berndtsson et al. (2019) stated that users could learn to understand how the display simplifies the decision by increasing data literacy and improving skills on deriving insight from data.

Participants from the study confirmed that basic statistical/analytics knowledge was a central theme. Multiple participants mentioned that IT departments are part of the organization that establishes the SSBI tool for casual users technology by specific topics like data structures, data governance, and data modeling. At the same time, business schools are institutions for core concepts of the business and analytical curriculum. Participants from the study also confirmed that casual users are co-creators in a BI activity. In SSBI initiatives, Bani-Hani et al. (2019) stated that casual users require knowledge and experience of the processes of data gathering, data preparation, data analysis, and visualization. Participants in the study emphasized the importance of educating and developing casual users' skills to enhance their interaction with technology

and improve their business performance. The study results extend knowledge on the works of Berndtsson et al. (2019) on the training and communication of the SSBI use and how the SSBI can change casual users' work routine.

IT Managers' Challenges for Empowering Casual Users in SSBI

The study results confirmed scholars' viewpoints that IT managers face user resistance from casual users that find the SSBI tool challenging to use and reports challenging to understand. Unclear requirements and complex data models can result in user frustration and uncertainty. The study's results align with research literature as notated by Imhoff and White (2011), which states that the main requirement for BI tools is to create easy to use BI tools for less experience casual users and increased understanding of BI results. Furthermore, Lennerholt et al. (2018) stated that SSBI implementation challenges exist related to developing easy to use BI tools and usable BI results that users can understand and explore to make decisions.

Many of the participants suggested that casual users lack the knowledge for ensuring data quality with the use of the SSBI tool, such as detecting or correcting errors to make accurate decisions or ask the right questions. The study results disconfirmed that the decision environment plays the least important role in SSBI success (Aminy et al., 2019), which states the type of data needed for the SSBI system is more important for changing the organizational or technical context than the user perception of overall quality, scope, and support of the data for strategic or operational decisions from the SSBI tool. Furthermore, casual users require a certain level of knowledge and competencies to use the BI tool for self-reliance during different analytic processes

(Bani-Hani et al., 2019) with visualization tools that support different cognitive styles (Engin & Vetschera, 2017).

Participants from the study confirmed that SSBI tools need to support casual user needs in a business-driven environment with easy to use BI tools and easy to enhance and use BI results as central themes. Multiple participants mentioned the IT managers' role to understand the work routines and the experiences to help develop the SSBI system and training to assist users in gaining skills to transform the culture. Participants from the study also confirmed that data quality is an issue for IT managers in building SSBI systems and providing casual users data. With data quality and data governance, Aminy et al. (2019) stated that the first challenge is for IT managers to establish data governance that ensures business–IT alignment to achieve high data quality and consistency without restricting the user's freedom innovation. Participants in the study highlighted that casual users need to be enabled to use the SSBI with features that work, consistent data meaning, and the ability to understand the context of data to improve decision making. The study results extend knowledge on the works of Lennerholt et al. (2018) on seeking knowledge about how organizations interpret the challenges of the casual users' use and access of SSBI.

Nature of a Successful SSBI-Initiative

The study results confirmed scholars' viewpoints that the design of the SSBI relates to the role of the users and the organizational goals. IT managers need to identify work processes and routines, creating SSBI tools that engage casual users for data exploration with user-friendly interfaces. The study results align with research literature

notated by Alpar and Schulz (2016) about the fit between business users' fit, skills, and the SSBI system's demands. Furthermore, Alpar and Schulz (2016) stated that analyzing data quickly and efficiently with interfaces expands the traditional BI role for casual users.

Participants from the study confirmed that a central theme was designed for user engagement. Multiple participants mentioned SSBI tools promote IT and business alignment while empowering casual users to explore and analyze data through interfaces. Participants from the study also confirmed that The SSBI solution is an environment that provides data for different analytical needs, so IT managers must recognize the importance of focusing on the users and their experiences for enabling organizational agility for various program settings (Bani-Hani et al., 2017). By developing an SSBI business case, IT managers must gather business requirements from different organizational teams, including power users and casual users (Yeoh & Koronios, 2010). Participants in the study emphasized the importance of the SSBI tool use from the casual user while determining how to improve casual user's skills and SSBI reliability. The study results extend knowledge on the works of Aminy et al. (2019) on ensuring SSBI use of casual users while the IT department provides the quality and maintains system functionality.

Critical Success Factors for BI Systems Implementation

The study results confirmed scholars' viewpoints that IT managers must consider the casual users' ongoing training needs to improve competencies, develop a communication system between IT staff and users, and involve casual users with all SSBI

initiative stages. CSFs are identified to support the successful SSBI initiative, and casual users adjust to new work routines and environments. These results align with the research literature as critical factors for success, Yeoh and Popovič (2016) stated that senior management support, ongoing training, business-driven initiative, and interactive user participation is an approach that can be offered by leaders to improve the implementation process. Furthermore, Yeoh and Popovič (2016) stated that ongoing education and support is an approach that can be offered by leaders to improve the implementation process.

Participants from the study confirmed that continuous training was one of the central themes discussed. Multiple participants mentioned a feedback loop for gathering information and requirements from casual users with an IT champion assisting in communication. Participants from the study also confirmed that casual users are associated with the business area, and they had concerns with casual users effectively using the SSBI. Team members of organizations have different needs concerning business analytics and demands on the SSBI tool (Rinkenberger, 2020), with IT managers coordinating complex social issues between the users for encouraging open communication, listening during team meetings to promote innovation, and addressing challenges (Hogan et al., 2018). Participants in the study emphasized the importance of ongoing training for casual users, while some users may require a mentor to use the system effectively. The study results extend knowledge on the works of Aminy et al. (2019) and Vargas and Comuzzi (2020) on other contextual factors to consider for enabling SSBI success.

Limitations of the Study

This qualitative, multicase study contains several limitations. The first limitation resided in the data collection process. A sample of nine business experts was recruited to participate in the research study, an adequate number to attain data saturation in qualitative research (Fusch & Ness, 2015); two participants opted to send written responses. This issue was mitigated by allowing interviewees to review the transcript of their answers and provide modifications as needed.

The second limitation was generalizability's inherent criticism with the qualitative research study method generalizability (Yin, 2017). I used a multicase study with multiple data sources instead of a single case study. The multiple data sources included interviews, journaling/reflective field notes, and archival data. Triangulation of data sources was used to strengthen the trustworthiness of the study's data (Guion et al., 2011).

The third limitation was in the challenge of gathering honest and transparent responses from participants. Participants may distort their responses due to their political or sociological context, including personal bias and anxiety (Merriam & Grenier, 2019). Power differentials may arise between the researcher and interviewees (Mero-Jaffe, 2011). As the researcher, I built trust with each participant, managed emotions, and assumed ethical responsibilities (Rubin & Rubin, 2012).

Recommendations

Merriam and Grenier (2019) recommended this research study focused on the need to fill a literature gap, expand theoretical knowledge for the SSBI research, and

make recommendations for future studies. IT managers continue to develop SSBI to reduce IT workload, yet efficiency remains low, with 70% of 2,680 users in a global survey identifying themselves as casual users with a limited skill set to meet BI task requirements (Baier et al., 2020). This multicase study is important because it may lead to a better understanding of the phenomena and provide information-rich data and recommendations for future studies (see Yin, 2017). The study's findings may improve IT managers' knowledge about CSFs that enable casual users to become more self-reliant and develop quality assurance and sustainability and competitive advantage strategies.

Recommendations for Practice

SSBI advocates claim that the future of BI belongs to casual users, yet, its low diffusion rate shows that managing its post-implementation process among casual user staff remains problematic (Lennerholt et al., 2020). An important issue for BI experts throughout my interviews is the casual users need to think about business problems, ask the right questions, and make better decisions with SSBI. Both current and new employees need training with the SSBI tools relating to their work routine to properly analyze the data and understand the information to make better decisions to adapt to remote conditions. Each casual user has different backgrounds with varying technical proficiencies and various job responsibilities and roles with an organization. Training is required for new employees to build statistical and analytical skills and become familiar with the SSBI tool. Current users need ongoing training to understand changes in work routines, enhance skills with SSBI tools, and transform their organizations into a data-driven culture.

With training, casual users learn how the SSBI benefits them by understanding how it relates to their job and extends their decision-making capabilities to solve problems. The training is an approach for users to become familiar with tools and encourage SSBI use, but users must work with a reliable system (Passlick et al., 2020). When casual users perceive SSBI reliability and accurate information, user satisfaction increases, and they trust the tools and are more willing to use the technology (Bani-Hani, Tona et al., 2018). The SSBI tools are created for casual users to access and analyze data. The casual users need to learn how the tools relate to their job and become comfortable with the tools before using it proficiently in their workplace. SSBI tools can work anywhere, any time, and any place in dynamic conditions of global economies or during a pandemic crisis.

Beyond training, IT managers need to consider the casual user's role and how they bring value to the SSBI tools to improve organizational performance. Casual users are co-producers of SSBI analytics with power users, requiring better resource allocation, data quality assurance, better SSBI management, and more comfortable use of BI tools (Bani-Hani, Tona et al., 2018). The business area of an organization is supported by technology without exhausting IT staff resources. In many organizations, IT managers face several challenges with high turn-over rates or limited resources in IT staff, causing work overload and building a successful SSBI. SSBI may not be one size fits all, and IT managers need to plan for specific users' tools and understand the motivations for their workflows (Lennerholt et al., 2020).

Aminy et al. (2019) provided several recommendations for organizations to attain CSF to both the technological and organizational context, recommending the (a) IT managers must organizations must match the right users with the right skills, tasks, and interest with their data access to data and freedom in the SSBI system, (b) the management of superusers and transforming them into proficient members of their BI team, (c) assurance of organizational business–IT alignment for data quality and communications, (d) achievement of high data quality without restricting user freedom, (e) align governance with data maturity and (f) develop meaningful semantic layers for users to make decisions and to enhance organizational transparency.

As stated by many of the study's participants, each user uses the SSBI differently, so IT managers need to evaluate the system and user performance in the post-implementation stage to determine if the SSBI tool meets expectations. They develop key performance indicators to monitor the SSBI environment consistency (Berndtsson et al., 2019). In addition to KPI, IT managers collaborate by sharing information, planned tasks, and processes within the same organization or between two organizations to achieve common goals and capabilities (Villamarín-García, 2020). The activity helps IT managers understand the users' performance or the team to encourage communication, track progress, and meet organizational goals. With a better understanding of how to improve, IT managers can begin to adjust the SSBI environment's scope for where to allocate resources, which users need training, or ask more questions to understand the casual user's role or improve the SSBI tool. To genuinely transform, data-driven cultures evolve with analytical capabilities to deliver the right data at the right time, which can

shift casual users' role from a data consumer to an information producer (Bani-Hani et al., 2019).

Recommendations for Scholarly Research

The conceptual framework was built with the BI success framework related to IT manager challenges in the BI literature that does not specify a relationship among casual users and CSFs. Limited knowledge exists on guiding casual users to expand their analytics capabilities, enhance their understanding of SSBI, and maintain BI quality, so they can make better decisions, improving SSBI task efficiencies (Berndtsson et al., 2019). Further research can expand the relationship between CSFs and challenges to empower casual users.

The presence of continuous training supports the prevalent themes of self-reliance and basic statistic/analytical knowledge within this study as a critical success factor for BI success that leads to understanding how data is used in their daily routine, data literacy, and data quality (Berndtsson et al., 2019). Data stewards in an organization can also add value to help casual users with their data needs and build trust (Rinkenberger, 2020). The present study's results are consistent with scholars' perspective that continuous training for casual users with meaningful context of data helps BI user adoption.

Further research needs to be conducted on how IT managers can link the organizations' training strategy to CSFs. This research can expand inquires into the different attributes to enable the successful implementation of BI systems within organizations (Yeoh & Popovič, 2016). This recommendation can further expand the

current scholars' perspective by highlighting the training and impact on casual users' organizational structure needs in a dynamic and changing global economy in a post-COVID-19 era.

Implications

Implications for Positive Social Change

This study was conducted to address a knowledge gap concerning how IT managers can guide casual users to expand their analytics skills, maintain BI quality, and improve their understanding of the SSBI tools to complete tasks successfully. It may also contribute to positive social change by offering executives a better understanding of how IT managers may develop training protocols to raise the BI competence of the casual user staff as one point of stability in a volatile and changing socioeconomic business environments. The casual users can gain valuable training and knowledge to improve their analytical skills and data literacy to interact with the SSBI to increase their business and competitive organizational performance.

Scholar-practitioners become change agents for positive social change by addressing and reacting to problems. In sociotechnology environments, organizational strategic vision and planning are needed for internal and external collaboration when resolving complex problems that impact people, processes, technology, and places. IT managers and scholars studying the ever-increasing need to establish data-driven cultures can begin significant social change through action research to gain a direct perspective of human-computer interactions' complexity. They can develop a more in-depth

understanding of the organization and apply recommendations to adjust the organizational strategy to improve business productivity.

Organizations are gathering data at profound volumes and varieties with complex data models and SSBI architectures. Casual users must maintain their ability to analyze and manage data to make decisions and maintain self-reliance. Similar research can promote the importance of the casual users' independence for data use and access to stabilize organization in the turbulent socioeconomic times coming in the post-pandemic era. Researchers can use in-depth interviews, biographical interviews, and focus group discussions for archival study. Aminy et al. (2019) proposed exploring other contexts that need to be considered in enabling SSBI success.

Implications for Practice and Policy

Understanding the CSF and challenges are vital factors for successful implementation. The implications of these capabilities to professional practice may improve IT managers' knowledge about CSFs that enable casual users to become more self-reliant, develop quality assurance and strategies for sustainability and competitive advantage (Aminy et al., 2019; Berndtsson et al., 2020). IT managers benefit from understanding the essential elements for SSBI success by creating easy to use SSBI tools and empowering casual users with education and training for a business-driven approach. Their work routine and how they perform analytics are essential in the successful design of an SSBI tool.

Understanding the CSFs is essential in the SSBI initiative, leading to successful competitive performance, and poor results reduce efficiency. Organizations are

consistently faced with internal and external factors that influence their SSBI implementation projects. More research is needed to understand the contextual factors of organization structure, people and their skills, and work routines to enable the BI systems within organizations (Yeoh & Popovič, 2016).

The casual users who are independent and self-reliant also conduct their analysis using the SSBI tool, reducing IT support. They understand how to access the data and make decisions with SSBI. These users are rich with the knowledge that has helped them to sustain work routines in their organizations. IT managers also need to understand how casual users work with analytics for SSBI to ensure proper change management planning and training (Berndtsson et al., 2020).

In organizations, each user has various levels of technical and analytical proficiencies. From a manager perspective, this provides companies with insight into what CSFs to look for when enabling casual users in the post-implementation stage. They can plan a vision and strategy and increase the BI skills of casual users (Bani-Hani et al., 2019; Berndtsson et al., 2019).

The integration of technology transforms organizations and their employees into business processes. IT managers needed to be mindful of the technology characteristic and capability when developing complex technology to ensure users successfully adopt the system. There is a need for a mutual understanding of the various departments and the organization's roles, so business and technology can become interwoven. The business–IT alignment is essential for combining the casual user staff's knowledge and skills with

analytical technology (Alpar & Schulz, 2016; Aminy et al., 2019). IT managers facilitate the strategies to integrate the SSBI solution to the business needs.

Implications of COVID-19

The study was conducted during the COVID-19 pandemic with BI experts' views on the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. I conducted interviews with participants and asked additional questions for clarification during this crisis. In the wake of the COVID-19 pandemic, scholars continue to face short-term and long-term shifts that impact the organizational sociotechnology system, recognizing the need to change technology infrastructure, social changes, and evidence of favorable benefit/cost tradeoffs to remote working (Hartmann & Lussier, 2020). The lifestyle change has disrupted how business is conducted for casual users. They work in a home office and not in a corporate setting surrounded by coworkers. The environmental setting is different, creating uncertainties for employees that may interfere with existing work routines and job security.

With the COVID-19 pandemic, voluntary and mandatory restrictions have rapidly changed the work routine and digital technology. The COVID-19 pandemic has to lead to significant changes, creating effects throughout time and producing opportunities without an exact resolution (Hartmann & Lussier, 2020). Many employees are working remotely due to the short-term effect of COVID-19, but they predict digital work forms to be significantly more critical in the future (Nagel, 2020). With the pandemic, people are no longer traveling to another location to attend to their work routine. They have the flexibility to work from anywhere, at any time. IT managers still need to support the job

of casual users that work remotely. Often, IT managers are responsible for developing strategies that support casual users and the integration of technology into their work practices or enhance their skills with analytics for decision making (Berndtsson et al., 2020)

SSBI can play a vital role in business activity monitoring, generating reports, understanding organizational markets, and providing a better quality of information for decision-making purposes in the COVID-19 pandemic (Bansai & Kumar, 2020). Organizations are more scalable with self-reliant casual users. As casual users develop insight from the SSBI use, business opportunities improve. However, proper training is needed to inform casual users of benefits and SSBI functionality (Lennerholt et al., 2020).

With COVID-19 conditions, most people believe that the pandemic has accelerated the digital transformation of work, and people are also more likely to imagine working exclusively digitally (Nagel, 2020). As users become more autonomous, the training needs for casual users will increase. Adequate and appropriate training can be offered to fill knowledge gaps to improve the autonomy and self-reliance of the casual users who use the SSBI in their remote workspace.

Implications for Theory

Scholars have found a gap in the literature on the challenges of SSBI use and the casual user. This research was essential to the research community because its results will address a gap in theoretical and research literature on guiding casual users to develop their analytics capabilities and SSBI use. Previous scholars have recommended future

empirical studies to understand the challenges of using SSBI by casual users (Lennerholt et al., 2018, 2020; Weiler, Marheinecke et al., 2019). In the research, limited guidance is available for casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality (Berndtsson et al., 2019) through subject-matter-experts' views.

This study aims to provide an original contribution of a conceptual or theoretical framework, requiring the effective use of multicase studies that include more than one case (Eisenhardt et al., 2016). Casual users tend to use BI tools they perceive as easy to use and meet their satisfaction (Blut et al., 2016). Often, IT managers do not develop strategies and integrate technology into casual users' work practices or enhance their analytics skills for decision-making (Berndtsson et al., 2020). SSBI research is a topic for guiding the framework of a conceptual model and building theory as a result of research findings (Aminy et al., 2019; Blut et al., 2016; Yeoh & Koronios, 2010). This research design approach is supported by extending knowledge within my conceptual framework to explicitly link the outcomes (i.e., capabilities) to livelihood strategies (Harrison et al., 2015). The extension of theoretical knowledge of the complex factors and context dimensions creates an interdependency between the CSFs for BI success and IT managers' challenges with empowering casual users, deepening the connection between the user and organizational perspectives (Aminy et al., 2019; Lennerholt et al., 2018; Yeoh & Koronios, 2010). It is an association to link the SSBI implementation between the level of the casual users' skills and be enabled to relate an SSBI tool to the contextual dimensions of the BI success framework's organization, processes, and technology.

This study was framed by two key conceptual models that focus on aligning with the purpose of the study, which was to describe BI experts' views on the CSFs needed for SSBI initiatives: (a) Lennerholt et al.'s (2018) concept of SSBI implementation challenges of self-reliant users, and (b) Yeoh and Koronios's (2010) The Framework of BI Success, that can be incorporated into research designs with the open nature of expert interviews (Littig & Pöchhacker, 2014).

During the research, I conducted the data analysis using the multicase study design commonly used to build or extend theory, as recommended by Eisenhardt and Graebner (2007). The multicase study strategy is an inductive research approach that enables themes to emerge from the data and allows the data and BI expert's perspectives to drive recommendations for further theoretical research (see Yin, 2017).

Conclusions

This research addressed a gap in the literature about the IT management's challenges for SSBI success that confront organizations concerning the support of the self-reliant casual users for sustainability and competitive advantages in a global economy. This study's participants provided valuable input into understanding the CSFs needed for SSBI initiatives among casual users in the post-implementation stage. The study participants provided insight regarding CSFs that enable casual users to become more self-reliant and develop quality assurance and strategies to improve business productivity. Their insight can remind IT managers to embrace the casual users' point-of-view when evaluating the CSFs of an SSBI initiative. Such insight can benefit IT managers in guiding casual users to develop their analytical capacities and increase their

understanding of the SSBI and maintain BI quality for completing tasks (Berndtsson et al., 2020). In SSBI management, the intra-organization and inter-organizational collaboration encompass the social, organizational, technological, and informational factors; and IT managers use collaboration for change management to successfully implement an SSBI tool and user adoption (see Villamarín-García, 2020).

Organizations need to be aware of the challenges of an SSBI initiative, problems that occur during implementation, and how to manage these issues (Lennerholt et al., 2020). It is a daunting task to overcome the obstacles for providing a useful SSBI tool that empowers users to gain valuable information for better decisions. There is a need for a digital transformation in the SSBI environment to engage individuals within an organization and change the as-usual culture by developing competence with a collaborative vision and fostering ongoing competencies (Eden et al., 2019).

The study participants' viewpoints offered recommendations for support of continuous training, which included ongoing training to teach casual users about analytics and system functionality for adoption into work routines and data-driven decisions for the intended SSBI use (Passlick et al., 2020). It is essential to understand the casual user roles to build a suitable SSBI tool. Continuous training improves the analytical and statistical skills of the users while maintaining ongoing communication. In the post -COVID-19 era, IT managers must understand how to address SSBI use problems with casual users in remote working conditions (Nagel, 2020). Future research can include an exploration of an analysis from the casual user's perspective to understand their roles, how they collaborate with other teams, their interactions with the SSBI project, their interest in

achieving success, and the business context of the data processing for planning and BI implementation (Villamarín-García, 2020)

Future research can expand the conceptual model to explore other organizational contexts that need to be considered during the planning and implementation to enable SSBI success (Aminy et al., 2019). The CSFs and the challenges for empowering users remains a challenge for IT managers. A better understanding of how the contextual factor can help guide IT managers to focus on the essential areas of interest when planning and implementing SSBI initiatives to sustain a competitive advantage in today's volatile global market.

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Appendix A: Interview Protocol

Participant No: _____
Gender: _____
Age_____
Highest Academic Degree: _____
Nationality:_____
Years as a published academic/practitioner researcher in business intelligence _____

Preliminary Actions:

Interviewer to participants: *Thank you for accepting my invitation to be interviewed in your capacity as a recognized scholar and subject-matter-expert in the business intelligence subject area. The purpose of this interview is to collect business intelligence experts' views on the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage.*

If you should need clarification on the content of any question, please feel free to ask me to provide an explanation before responding. Periodically I may ask clarifying questions or encourage you to describe in more detail. You are invited to elaborate where you feel comfortable and decline from doing so when you do not have information to add.

Before we begin the interview, it is important that you are comfortable in your location, and you feel free to participate without interruptions. Do you feel this description describes your setting?

May I begin the interview?

Interviewer to participants: A significant challenge among IT managers remains how to guide casual users to expand their analytics capabilities, increase their understanding of SSBI, and maintain BI quality so they can complete their assigned IS-related tasks successfully. The purpose of this interview is to collect business intelligence-experts' views on the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage.

Before we get started and to ensure consistency among participants' interview responses, I would like to share with you the definitions of terms used within the interview questions as they are defined within this study.

Business intelligence (BI): This term refers to business analytics and information technology that processes and manipulates data for final analysis, as well as decision support systems that support users for complex decision making.

Critical success factors (CSFs)*:* This term refers to areas of activities that support the achievement of goals for all organizations. From an IT managers' perspective, the CSFs for this study focuses on self-service business intelligence initiatives among casual users in the post-implementation stage. CSFs factors within data-driven organizations result in successful competitive performance, and poor results lead to reduce efficiency.

Casual user: This term refers to the inexperienced or non-technical users with data needs for decision making and complete tasks with limited knowledge of the complex data relationships and access to data resources.

Self-service business intelligence (SSBI): This term refers to a computing environment and tools used to connect and analyze data, and which are operated primarily by casual users in business departments of organizations – rather than IT professionals or dedicated data analysts.

1. What type of BI-skills should the casual user (inexperienced or non-technical users) possess to make effective use of an SSBI-system?

2. What role do these casual users' BI skills play in the effective use of an SSBI-system?

3. What type of education must be given to casual users to achieve SSBI success? Who should do the education: business schools or IT departments?

4. What role should IT managers play at the actual implementation stage within an SSBI context to empower casual users?

5. How can IT managers ensure the data quality in the context of SSBI with casual users?

6. From your perspective, what is a successful SSBI-initiative?

7. From your perspective, what are the critical success factors IT managers need to apply for SSBI initiative success among casual users in the post-implementation stage?

8. In closing this interview, would you care to add more thoughts on *critical success factors needed for self-service business intelligence initiatives among casual users?*

Thank you for assisting me with this research study. I will contact you via email once the transcription from our interview is finalized. I will provide a summary of the interview, and I would like for you to review the summary as a confirmation that I have captured the essence of what you have shared with me. If any discrepancies are found, I will correct the interpretations. Do you have any questions? Please contact me if you have any questions now at a later time.

Appendix B: Recruitment Letter

Good day, I am a doctoral student at Walden University, inviting you to participate in my research that explores the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage, which, as you may know, is an important issue for organizations in reaching a competitive advantage for long-term sustainability. I believe that your experience would be a great contribution to the study.

Therefore, I am reaching out to discern if you might have an interest in participating in the research. Participant's eligibility for this study includes the following criteria: academics who have (a) authored at least five (5) peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search under the term *self-service business intelligence;* (b) have terminal degrees from accredited institutions; (c) have conducted extensive studies on management, business intelligence, and business intelligence critical success factors for users; and (d) possess deep knowledge regarding their experiences with the topic of the study.

The study is important, as the findings may inform IT managers on how to guide casual users to expand their analytics capabilities, increase their understanding of self-service business intelligence, and maintain business intelligence quality so they can complete their assigned IS-related tasks successfully. Finally, the social change impact of this study may potentially result from providing executives a better understanding of how IT managers may develop training protocols to raise the business intelligence competence of the casual user staff as one point of stability in a volatile and changing socioeconomic business environment.

An Informed Consent form is attached to this e-mail that explains in further detail concerning the key elements of the research study and what your volunteer participation will involve for this research study. After reading the Letter of Recruitment and the attached Consent form, if you would be interested in participating in this study, kindly confirm your interest by responding to the words, "I consent" via Linkedin e-mail or personal e-mail if requested, the participant.

Respectfully,

Appendix C: Walden Institutional Review Board Approval

IRB ID: 08-26-20-0543457

As a doctoral student at Walden University, I am inviting you to participate in my research that explores **the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage**. I believe that your experience would be a significant contribution to the study. I appreciate and respect your expertise and have cited in your scholarly works within my Dissertation.

The study is important, as the findings may inform IT managers on how to guide casual users to expand their analytics capabilities, increase their understanding of self-service business intelligence, and maintain business intelligence quality to complete their assigned IS-related tasks successfully. Finally, the social change impact of this study may potentially result from providing executives a better understanding of how IT managers may develop training protocols to raise the business intelligence competence of the casual user.

An Informed Consent form below explains in further detail the key elements of the research study and what your volunteer participation will involve. After reading the Consent Form, if you would be interested in participating in this study, kindly confirm your interest by responding to the words, "I consent" to this email. After receiving the confirmation, I will send you the interview protocol and we can schedule an interview or you can also choose to type your replies on the interview protocol sheet if you wish.

You are invited to take part in a research study about the views of business intelligence experts on the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage. The researcher is inviting academics who (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2010 and 2020 when undergoing a word search under the terms "self-service business intelligence"; (b) have terminal degrees from accredited institutions; (c) have conducted extensive studies on management, business intelligence, and business intelligence critical success factors for users. I obtained your name via social media (LinkedIn). This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Eva Shepherd, who is a doctoral student at Walden University.

Background Information:

The purpose of this study is to gain a greater understanding of business intelligence experts' views on the critical success factors needed for self-service business intelligence initiatives among casual users in the post-implementation stage. I believe that your experience would be a great contribution to the study. Please note that participants' names, contact information, or any other identifying information will not be recorded in any of the research records.

Procedures:

If you agree to be in this study, you will be asked to:

- Participate in an interview that will last between 30 and 40 minutes. Our interviews will take place either via Skype, FaceTime, email, or telephone. You will have the option to provide your preference for which method we use.

- I will be asking questions related to your experiences as an academic in the subject matter of business intelligence.

- Agree to the session being recorded for the researcher's purposes only, to allow for transcription of the interview. Only audio recordings will be taken; there will not be any recording with video.

- Within 72 hours of the interview, you will receive a copy of the transcript and have 72 hours to correct or edit anything which the researcher did not capture correctly. An estimation for corrections and edits of the transcripts is 30 minutes for purposes of transcript review. Please note that if you do not reply within the 72-hour limit, it will be understood that you agree with the content within the transcription of our conversation.

Here are some sample questions :

1. **What role does the casual users' BI-skills play in the effective use of an SSBI-system?**

2. **How can IT managers ensure the data quality in the context of SSBI with casual users?**

Voluntary Nature of the Study:

This study is voluntary. You are free to accept or turn down the invitation. If you decide to be in the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this type of study involves some risk of minor discomforts that can be encountered in daily life, such as fatigue, stress, or becoming upset. Being in this study would not pose a risk to your safety or well-being.

The study is important, as the findings may inform IT managers on how to guide casual users to expand their analytics capabilities, increase their understanding of self-service business intelligence, and maintain business intelligence quality so they can complete their assigned IS-related tasks successfully. There are no direct benefits and no compensation to individuals participating in this study.

Payment:

There is no payment for being part of the study;

Privacy:

Reports coming out of this study will not share the identities of individual participants. The researcher will not use your personal information for any purpose outside of this research project. Data will be kept secure by password protection and the use of codes in place of names. Data will be kept for a period of at least five years, as required by the university.

Contacts and Questions:

You may ask any questions you have now. Alternatively, if you have questions later, you may contact the researcher via email at eva.shepherd@waldenu.edu. If you want to talk privately about your rights as a participant, please call the Research Participant Advocate at my university at 612-312-1210. Walden University's IRB approval number for this study is **08-26-20-0543457,** and it expires on **8/25/2021.**

Please print or save this consent form for your records.

Obtaining Your Consent

If you feel you understand the study well enough to decide it, please indicate your consent replying to this email with the words, "I consent."

Thank you.

Eva Shepherd
Ph.D. Candidate – Walden University