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## Design Thinking for Innovation Within Manufacturing SMEs: A Multiple Case Study

Jarno Manzke  
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# Walden University

College of Management and Technology

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Jarno Manzke

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Walden University  
2022

Abstract

Design Thinking for Innovation Within Manufacturing SMEs: A Multiple Case Study

by

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MBA, University of Mary Washington, 2015

MS, University of Applied Sciences Offenburg, 2004

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

Walden University

February 2022

## Abstract

Manufacturing small and medium enterprise (SME) leaders have sparse information on using design thinking to support their firm's business sustainability and competitive advantage. The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. A multiple case study design was used to collect data from a purposeful sample of seven design thinking experts. Semistructured interviews, archival data, and reflective field notes drove credibility of the findings through data triangulation. This study was framed by two concepts developed by Bjoerklund et al. within their integrating design across the organization model: (a) the concept of coevolving design capabilities and (b) the concept of the design-driven organization. Twenty-eight themes emerged from the data analysis, with six coding categories grounded in the conceptual framework: (a) leadership competencies for implementing a design strategy in SMEs, (b) leading a cross-functional team to adopt design thinking, (c) sustaining design thinking within a cross-functional team, (d) developing a design thinking business model for sustainability, (e) gaining competitive advantage with a design thinking business model, and (f) embedding design thinking in a manufacturing SME to drive competitive advantage. This study's results may drive positive social change by providing manufacturing SME leaders with a better understanding of how to successfully use design thinking to achieve business sustainability and competitive advantage, creating better business longevity.

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## Dedication

This dissertation is dedicated to my grandfather, “Großvater (GV)”, my wonderful wife Sandra, and my amazing son Dexter.

My grandfather believed in continuous education, an open mindset, peaceful family nights, and me. He inspired me to go to engineering school and continue to grow even after my graduation. He continues to live within me as a pillar of strength and guidance.

My wife Sandra deserves all my gratitude for supporting me on my “crazy” doctoral journey. Without her patience and encouragement, I could not have grown professionally and personally.

Finally, I am thankful for my son, Dexter, who would lighten my study sessions with his joyful energy. May this dissertation serve as an inspiration to him, that the sky is the limit.

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## Chapter 1: Introduction to the Study

Design thinking is a robust method for leaders of small-and-medium enterprises (SMEs) to link creativity with innovation and face the complexity of the modern business environment (Knight et al., 2020; Kolko, 2015). While large-sized enterprise leaders continue to work on the successful adoption of design thinking processes, leaders of SMEs remain confronted by various challenges constraining their innovation activities, including resistance to change by long-term employees and budget constraints (Naradda Gamage et al., 2020). Organizational and design thinking scholars write that SME leaders remain unsuccessful in adopting innovative design-thinking processes, placing their businesses at a disadvantage for long-term sustainability and competitive advantage (Eide et al., 2021; Lattemann et al., 2020).

Many family owned businesses also tend to resist change within the manufacturing sector leaders lack the knowledge to drive the successful buy-in of innovative business models to their managers and engineers (Zhang et al., 2021). Different working and cultural distances between management, engineers, and designers and limited budgets make it difficult to build design-driven SMEs within the manufacturing sector. Exercising design capabilities requires business owners to adopt deep and comprehensive design capabilities across their departments, and practice-based research on this topic is rare (Bjoerklund et al., 2020; Ferrara & Lecce, 2020). Further empirical research is now needed from strategy-as-practice scholars to fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is

economically sustainable (Gusakov, 2020; Knight et al., 2020). The results of such a study may drive positive social change by providing manufacturing SME leaders with a better understanding of how to successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020).

This chapter presents an introduction and background of the study, the problem statement, the purpose of the study, the research question, the conceptual framework, and the study's nature. The chapter also includes the definitions, the assumptions, the scope and delimitations, the limitations, the significance, and the summary.

### **Background of the Study**

The increased rate of new technologies, globalization, and fierce competition created a business environment characterized by chaos and unprecedented changes (Millar et al., 2018). The average tenure of companies in the S&P 500 decreased from 33 years in 1964 to 24 years in 2016 and is predicted to fall to just 12 years by 2024, substantiating the intensifying challenge for established firms (Anthony et al., 2018). Adopting innovative business models has proved to be essential for the success and survival of organizations in turbulent environments (Newman et al., 2020; Shanker et al., 2017). Design thinking may increase organizational performance by adopting innovative business models (Elsbach & Stigliani, 2018; Knight et al., 2020). Design thinking enables companies to persevere within chaotic environments (Cousins, 2018a; Wrigley et al., 2020). Advancing volatility, uncertainty, complexity, and ambiguity formed a chaotic and

turbulent environment. Executive leaders face increasingly complex strategic planning and unpredictable forecasting (Millar et al., 2018).

To meet the challenges of the market, some companies have employed the use of design thinking methodology to develop an intimate understanding of customer needs and the business environment (Beckman, 2020; Brown, 2008). The actual steps used in the methodology may be different depending on the practitioner, but in all cases, the process is combined with a focus on a growth mindset or design attitude that fosters the development of a product and service development vision unique to the end user's perspective (Brown, 2008). Nevertheless, the challenge for many organizational leaders remains that of building a team of engaged, creative, and connected employees while solving complex business challenges that are uniquely designed for end-users needs (Elsbach & Stigliani, 2018; Mutonyi et al., 2020).

Beyond incremental improvements, innovation is associated with organizational performance, particularly for financially challenged SMEs (Lattemann et al., 2020). Organizations that are slow to adopt innovative business models focus on incremental learning find themselves at risk of losing their competitive edge and remaining relevant in such chaotic environments (Cousins, 2018a; Eide et al., 2021). Previous researchers suggested that specific large-sized organizations support design thinking, but a literature gap exists on how SMEs can successfully adopt design thinking within their long-term strategic management plan (Elsbach & Stigliani, 2018; Micheli et al., 2018). Adopting design thinking processes to drive the formalization of product and service development

processes becomes more effective when designers operate with cross-functional teams and balance design with commercial considerations (Ferrara & Lecce, 2020).

Research indicates that design thinking is an agile innovation approach for large-scale enterprises to develop absorptive capacity. Nevertheless, the same assumptions do not hold for SMEs because of their limited financial resources, time restrictions to engage with design thinking, and unfamiliarity of working with external partners (Magistretti et al., 2020; Wrigley et al., 2020). Today, the SME manufacturing sector's sustainability and competitive market advantage are challenged by their larger-sized competitors' readiness to quickly adopt and apply innovative business models to support their strategic management goals (Khurana et al., 2021). Exercising design capabilities comprehensively requires business owners to adopt deep and comprehensive design capabilities across their departments (Bjoerklund et al., 2020). Scholars point out that manufacturing SMEs still struggle to develop the cross-functional collaboration needed among their employees to adopt design thinking processes effectively (Ferrara & Lecce, 2020).

Developing a design-driven SME that is economically sustainable becomes a critical problem for SME owners, calling for further empirical research from strategy-as-practice scholars (Gusakov, 2020; Knight et al., 2020). The practitioner and theoretically-based literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can successfully lead a design-driven organization given various challenges

constraining their adoption of innovative business models (Mueller et al., 2020; Naradda Gamage et al., 2020).

### **Problem Statement**

In the past 2 decades, research emphasized the importance of design thinking for corporations to drive innovation processes to increase the organization's competitive advantage. Standard and Poor's 500 reported that design-centric companies outperform by 211% (Design Management Institute, 2019). While large and multinational firms well understand the successful adoption of design thinking processes, the same continues to be a challenge for leaders of SMEs, who remain confronted by various challenges constraining their innovation activities, including resistance to change by long-term employees (Naradda Gamage et al., 2020). The specific challenges encountered by SME leaders to adopt design thinking processes include limited budgets, access to skilled labor, lack of design thinking competencies, missing market know-how to meet end-user needs, and team resistance to accepting external knowledge sharing (Magistretti et al., 2020). The social problem is that many SME leaders remain unsuccessful in embedding innovative design-thinking processes within their long-term strategy, placing these businesses at a disadvantage for long-term sustainability compared to their larger-sized competitors (Eide et al., 2021; Lattemann et al., 2020).

To successfully embed the design-thinking process in manufacturing, SMEs, leaders, engineers, and designers must cooperate to build cross-functional team collaboration (Wrigley et al., 2020). Although previous research has highlighted

championing design thinking in large corporations, scholars point out that without a practical roadmap to “selling” design processes horizontally, SME leaders will sabotage the cross-functional collaboration needed to adopt design thinking processes effectively (Ferrara & Lecce, 2020). The extant literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020; Roper et al., 2016). The critical challenge for SME leaders remains in adopting design thinking to drive their innovation while remaining economically sustainable and calls for further empirical research from strategy-as-practice scholars (Bjoerklund et al., 2020; Gusakov, 2020; Knight et al., 2020). The specific management problem is that manufacturing SME leaders have sparse information on successfully driving design thinking as an innovation strategy to support business sustainability and competitive advantage within their firm (Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020).

### **Purpose of the Study**

The purpose of this qualitative multiple case study was to describe design thinking experts’ views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. To meet the purpose of the study and address this documented knowledge gap among manufacturing SME leaders and be consistent with the qualitative paradigm, a multiple case study design (see Yin, 2017) was used to

collect data from a purposeful sample of design thinking experts. The open nature of expert interviews allowed collecting data from experts' breadth of knowledge and experience in research fields that still need exploring (Littig & Poehhacker, 2014). Semistructured interviews (Halkias & Neubert, 2020), archival data, and reflective field notes (Merriam & Tisdell, 2015) were used to enhance the trustworthiness of the multiple case study findings through data triangulation (see Farquhar et al., 2020).

### **Research Question**

How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?

### **Conceptual Framework**

There is still little known about how SME business owners may successfully drive design-thinking processes within their firms as an innovation strategy to support business sustainability and competitive advantage while practically achieving buy-in from their non-design staff (Ferrara & Lecce, 2020). This study was framed by two concepts developed by Bjoerklund et al. (2020) within their *integrating design across the organization model*: (a) the concept of *coevolving design capabilities* and (b) the concept of *the design-driven organization*. A joint research team developed the integrating design across the organization model (Bjoerklund et al., 2020) from the Design Factory at Aalto University School of Engineering (Finland), Aalto University School of Business (Finland), Stanford University Graduate School of Business (USA), and Idean Palo Alto

(USA), to illustrate the coevolution of two types of design capabilities across a project management team.

Without a practical roadmap of how to “sell” design processes horizontally, SME leaders may sabotage the cross-functional collaboration needed to adopt design thinking processes effectively (Ferrara & Lecce, 2020). Bjorklund et al. (2020) found scant scholarly work on the integration of design in an organization and thus framed their work by several practitioner frameworks, such as the Danish Design Centre’s Design Ladder, the Artefakt’s Design Maturity Matrix, the Design Value Scorecard, and the Design Management Staircase, that depict differences in the extent that design is integrated into organizations. The one theoretical study Bjorklund et al. did cite in their work was Micheli et al.’s (2018) study on elevating the status of the design function within an organization from a “fringe” function to a legitimate one and is grounded in organizational theory that emphasized that obtaining legitimacy is essential for any entity (organization or a function) to ensure access to resources (Bitektine & Haack, 2015). Further elaboration on the logical connections among critical elements of the framework to the study’s purpose and its relation to the study approach, research question, and research method is further explained in Chapter 2.

### **Nature of the Study**

The nature of this study was qualitative to best align with the purpose of the research. Qualitative researchers seek to explore and understand how humans construct reality based on individual experiences and discrete social and cultural settings (Cooper

& White, 2012; Schram, 2006). Conversely, a researcher might attempt to identify a statistical association between variables to test hypotheses and theories (Schubert, 2017). I did not seek to investigate numerical relationships but rather to understand and explore human experiences. Rather than identifying correlations, the constructivist researcher uses qualitative studies to understand experiences and phenomena (Cooper & White, 2012).

To meet the study's purpose, a study of experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy, an exploratory multiple case study design was employed (see Yin, 2017). Compared to the single case study design, the multiple case study design allows the comparing of collected data between multiple cases generates and provides a deeper understanding of the problem (Ridder, 2017). The case study design is often used to understand multifaceted phenomena within their context (Baxter & Jack, 2008). Using case studies, researchers can examine a transformation or development of a topic of interest. Case studies are preferred when researching current or contemporary topics and, the research question focuses on "how" questions, but the participants' behavior cannot be influenced, and theory needs to be put in a natural context (Yin, 2017).

Each case in a multiple case study stands on its own and serves as a discrete analytical unit allowing the researcher to explore the phenomenon using replication and contrasts to extend the emerging theory (Eisenhardt & Graebner, 2007; Yin, 2017). Yin (2017) noted that, within a multiple case study design, the unit of analysis can be an

individual in a specific context and that the research question relates to the unit of analysis. The study's central phenomenon was the individual, and the context was design thinking experts. In developing a study of individuals living within a community and not the whole of the community itself, the most appropriate qualitative design to collect data with the goal of theory extension is an exploratory, multiple-case study design (Eisenhardt et al., 2016; Halkias & Neubert, 2020). The design thinking expert was the unit of analysis in this multiple case study.

The sampling strategy comprised of purposeful sampling, criterion, and network sampling (see Merriam & Tisdell, 2015). I recruited seven experts knowledgeable about the topic of interest for individual in-depth interviews before reaching data saturation. Participants were screened based on the following inclusion criteria: (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and 2021 when undergoing a word search under the terms *design thinking*, *SME*, *innovation strategy*, *business sustainability*, and *competitive advantage*; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam & Tisdell, 2015).

After the data collection, I applied the cross-case synthesis method as a data analysis technique to compare and contrast the data between the cases until patterns, themes, and ideas emerge (see Yin, 2017). The cross-case synthesis method is used to retain the case integrity to extend theory in multiple case studies (Yin, 2017). Data triangulation between the collected data from the semistructured interviews, archival

data, and reflective field notes will strengthen the trustworthiness of the study results (see Farquhar et al., 2020; Halkias & Neubert, 2020).

### **Definitions**

*Business sustainability:* This term refers to managing and coordinating environmental, social, and financial demands and concerns to ensure business units' responsible, ethical, and ongoing success (Khurana et al., 2021).

*Competitive advantage:* This term refers to an organization's differentiation from competitors that retain existing or create new customers (Morris, 2013).

*Cross-functional team:* This term refers to an inter-departmental collaborative workgroup in organizations (Bjoerklund et al., 2020).

*Design thinking:* This term refers to the approaches and methodologies developed in the field of design for abductively creating nonroutine solutions to ill-defined problems, regardless of the domain of application. Most scholars connect the concept of design thinking to human or user-centered innovation, creative problem-solving, experimentation, and iteration (Bjoerklund et al., 2020).

*End-user needs:* This term refers to the central consideration of design thinking activities. Regarding business processes, the end-user need is that technologies or processes should be intuitive and pleasant to interact with (Kolko, 2015).

*Innovation strategy:* This term refers to an ever-present, entrenched activity within an organization that allows companies to adapt to change and, thereby, retains existing and creates new advantages (Knight et al., 2020).

*Knowledge sharing:* This term refers to a formal information exchange between individuals with the main benefit of gaining new insights from diverse resources (Alsharo et al., 2017).

*Machine manufacturing sector:* This term refers to establishments engaged in manufacturing industrial and commercial machinery and equipment and computers and in the wholesale distribution of industrial machinery and equipment (SICCODE.com, 2008).

*Manufacturing industry:* This term refers to the branch of manufacture and trade based on the fabrication, processing, or preparation of products from raw materials and commodities. Physical transformation is assumed to be how manufacturing creates economic benefits (Levinson, 2017).

*SMEs:* This term refers to small to medium-sized businesses defined by the “Small Business Administration’s Table of Size Standards.” Depending on the subcategory (e.g., farm machinery, construction machinery), companies with between 500–1,000 employees are defined as small to medium-sized businesses (Small Business Administration, 2012).

### **Assumptions**

The researcher must openly communicate the taken assumptions to the reader to improve the quality of the study’s findings and conclusions (Theofanidis & Fountouki, 2018). This study was based on the following four assumptions. The first assumption is that this research would have the rigor to appease common concerns about the validity and reliability in case study designs (see Runfola et al., 2017). The second assumption is

that the recruited participants engaged actively, answered the questions during the interview truthfully, and knew the research topic. The latter was managed using inclusion criteria to screen participants about their qualifications. A detailed interview protocol and data triangulation further strengthened the trustworthiness of the study results (see Merriam & Tisdell, 2015; Yin, 2017).

The third assumption concerns the specific use of expert interviews: Due to their high level of knowledge, experts might frame the issue in a particular way and influence the understanding of the less knowledgeable researcher (Bogner et al., 2018). Therefore, the third assumption is that experts presented their special knowledge comprehensively and coherently. The fourth and final assumption is that my personal bias to this research was sufficiently managed throughout the research. While it is impossible to avoid, I controlled my bias by interviewing plentiful, highly knowledgeable experts who brought many perspectives to the data collection (see Eisenhardt & Graebner, 2007). Data triangulation added further depth to the data collection and helped to reduce my researcher's bias (Fusch et al., 2018).

### **Scope and Delimitations**

Design thinking has gained enormous traction over the recent years as an innovation tool (Liedtka, 2017). Design thinking matured and is more and more recognized as a strategic instrument beyond product innovation (Knight et al., 2020; Kolko, 2015). The scope of a study describes the research problem closely (Goes & Simon, 2017). The research problem is that manufacturing SME leaders have sparse

information on successfully driving design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020). The scope of the study was design thinking in the context of manufacturing SMEs' innovation strategy to support business sustainability and competitive advantage.

The study's delimitations are consciously chosen and narrow the research within the scope of the study (Goes & Simon, 2017). Delimitations derive from the selected sample's inclusion and exclusion criteria when the replication process of a case study is started (Yin, 2017). The replication process of the case study began with selecting the experts for the topic of interest. A subject matter expert can be defined as someone with knowledge beyond the average worker in the related subject matter due to their education, training, length, and type of work experience, publications, awards, and peer recognition (Hopkins & Unger, 2017, p. 227). In this research study, the experts were recruited via network sampling and purposeful sampling and were defined with the following inclusion criteria: (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and 2021 when undergoing a word search under the terms design thinking, SME, innovation strategy, business sustainability, and competitive advantage; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam & Tisdell, 2015).

## **Limitations**

Limitations in case study research are imposed features the researcher has no control over and may impact the study results (Yin, 2017). Limitations need to be reported to the reader to improve the quality of the study's findings and interpretations (Theofanidis & Fountouki, 2018). The first limitation is the nature of the study, as qualitative research can hardly be replicated (see Theofanidis & Fountouki, 2018). Despite the robust design of multiple case studies, the qualitative nature of the research will provide an analytical, not a statistical, generalization (Yin, 2017). The second limitation is the chosen case study design concerning methodological rigor and consequent doubt about the study's reliability and validity (see Runfola et al., 2017).

## **Significance of the Study**

### **Significance to Practice**

This study is significant because it contributes to the management field by understanding design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Bjoerklund et al., 2020). Academic scholars have documented the successful adoption of design thinking processes in large and multinational firms (Elsbach & Stigliani, 2018; Knight et al., 2020). Nevertheless, challenges in developing a design-driven organization remain for leaders of SMEs, who continue to be confronted by staffing challenges, time limitations,

and budgetary constraints hindering their innovation activities (Magistretti et al., 2020; Naradda Gamage et al., 2020; Wrigley et al., 2020).

Exploring design thinking experts' views on how SME leaders can successfully develop a design-driven business to drive their innovation process while remaining economically sustainable called for further empirical research from strategy-as-practice scholars (Bjoerklund et al., 2020; Gusakov, 2020). Varying working and cultural distances between management, engineers, and designers and limited budgets make it difficult to build design-driven SMEs within the manufacturing sector (Khurana et al., 2021). The significance of my study to professional practice is that the results inform business owners on integrating comprehensive design capabilities across their departments to drive cross-team collaboration in design-driven SMEs (see Bjoerklund et al., 2020; Ferrara & Lecce, 2020).

### **Significance to Theory**

Strategy-as-practice scholars called for further empirical research to fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020). This study is significant to theory by contributing original qualitative data to Bjoerklund et al.'s (2020) integrating design across the organization model on developing co-evolving design capabilities within project teams to further cross-team collaboration in the design-driven organization. Such empirical results exploring design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as

an innovation strategy to support business sustainability and competitive advantage contribute to extending theory in the management literature and within the study's conceptual framework (see Bjoerklund et al., 2020).

### **Significance to Social Change**

Scholars pointed out that manufacturing SME owners still struggle to develop the cross-functional collaboration needed among their employees to adopt design thinking processes effectively (Ferrara & Lecce, 2020). The extant literature on the gap amongst these numerous streams of academic research and practice-based knowledge was founded on the lack of research of successful design-thinking processes within the manufacturing SMEs sector and led to a literature gap on how SME leaders can practically support design thinking buy-in from their nondesign staff (Ferrara & Lecce, 2020). The results of this study can drive positive social change by providing manufacturing SME leaders with a better understanding of how to successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020).

### **Summary and Transition**

The specific management problem is that manufacturing SME leaders have sparse information on successfully driving design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020). The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing

SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. To meet the purpose of the study and be consistent with the qualitative paradigm, a multiple case study design (see Yin, 2017) was used to collect data from a purposeful sample of design thinking experts. The open nature of expert interviews allowed experts' breadth of knowledge to contribute knowledge in research fields that still need exploring (see Littig & Poehhacker, 2014). Semistructured interviews (Halkias & Neubert, 2020), archival data, and reflective field notes (Merriam & Tisdell, 2015) were used to enhance the trustworthiness of the multiple case study findings through data triangulation (Farquhar et al., 2020). This study is significant to theory, practice, and social change as it contributes to a deeper understanding of design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

Chapter 2 will provide the literature search strategy and the conceptual framework for this research study. To present knowledge within a narrative literature review on the specific problems presented in the extant literature on driving design thinking within SMEs, including those in the manufacturing industry firm, as an innovation strategy to support business sustainability and competitive advantage.

## Chapter 2: Literature Review

The social problem many SME owners face is the failure to embed innovative design-thinking processes within their long-term strategy, placing these businesses at a disadvantage for long-term sustainability compared to their larger-sized competitors (Eide et al., 2021; Lattemann et al., 2020). The challenge for many organizational leaders remains that of building a team of engaged, creative, and connected employees while solving complex business challenges uniquely designed for end-users needs (Elsbach & Stigliani, 2018; Mutonyi et al., 2020). The specific management problem is that manufacturing SME leaders have sparse information on successfully driving design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (Eide et al., 2021; Lattemann et al., 2020; Mueller et al., 2020).

To meet the challenges of today's manufacturing market, some large companies have employed the use of design thinking methodology to develop an intimate understanding of customer needs (Beckman, 2020; Brown, 2008). The actual steps used in the design thinking methodology formulate a business culture, growth mindset, and design attitude across a firm's different units to come together into one cross-functional team that successfully collaborates within a design-driven organization (Bjoerklund et al., 2020). The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

Chapter 2 will 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 regarding the following topics: design thinking, design thinking tools, the effect of organizational culture on design thinking, innovation, and competitive advantage in the context of design thinking, the design integration challenges of SME leaders in the manufacturing sector, design thinking buy-in, design thinking and cross-functional teams, design thinking, and profit.

### **Literature Search Strategy**

The study's purpose inspired me to search and find current and seminal publications related to the topic of interest. Using multiple resources to find relevant literature, I accessed the Thoreau databases using the online Walden University Library, SAGE Journals, ABI/INFORM Collection, Emerald Insight, ProQuest Central, SAGE Journals, Springer e-books, Taylor and Francis Online, Google Scholar, Google Books, and the generic Google Search engine. The databases used via the online Walden University library were Business Source Complete, Emerald Insight, Science Direct, IEEE Xplore Digital Library, Complementary Index, Directory of Open Access Journals, ProQuest, Dissertations & Theses @ Walden University, SAGE, and Emerald Insight.

Google Scholar proved to be helpful to expand on the first findings using citation mining or to find further publications with similar topics. I employed the generic Google search engine to identify search phrases and inspire my search strategy. Considering the different sources' nature, all found publications were checked for authenticity using

Ulrich's Periodical Directory (*Ulrich's Periodicals Directory*, n.d.). Out of a total of 154 references, the literature review encompassed 65 publications, of which 48 (74%) were peer-reviewed, and 42 (65%) were published between 2017–2022 (Table 1). To remain current with newly published literature, I created search alarms in the online Walden Library and Google Scholar, including keywords such as *business sustainability*, *competitive advantage*, *cross-functional collaboration*, *design integration*, *design thinking*, *innovation strategy*, and *organizational change* and their appropriate synonyms in various combinations.

**Table 1**

*References by Type and Publication Year*

Publication Year	2022-2017	2016-2011	2010-2000	1999-1978
Peer-reviewed articles	34	10	2	2
Not peer-reviewed articles	5	2	2	
Books	1		3	2
Thesis	2			
Total	42	12	7	4

My literature research focused on current and seminal publications relevant to the purpose of the study and concerning the methodology of the research. The initial search terms that were used with the Thoreau databases and Google Scholar were *learning*

*organizations, organizational learning, organizational change, organizational transformation, organizational culture, design thinking, design thinking tools, design thinking beyond product development, strategic design thinking, design thinking buy-in, innovation strategies, cognitive diversity, divergent thinking, virtual teams, heterogeny teams, innovation, ideation, creativity, sustainability in SMEs, SMEs and competitive advantage, qualitative research, case studies, multiple case studies, interviewing, and data analysis.* Table 2 presents all found literature (Chapters 1–3) across the core topics of the proposed study.

**Table 2**

*Numbers of Journal Articles, Books, and Students' Theses by Topic*

	Journals		Books	Theses
	Peer-reviewed	Not peer-reviewed		
Design	25	10	2	2
Innovation	14	2		
Cross-Functional Teams	8			
Organizational Culture	6		2	
Methodology	41	7	24	1
Theory	7	3	4	
<b>Total</b>	<b>101</b>	<b>22</b>	<b>32</b>	<b>3</b>

## Conceptual Framework

There is still little known about how SME business owners may successfully drive design-thinking processes within their firms as an innovation strategy to support business sustainability and competitive advantage while practically achieving buy-in from their non-design staff (Bjoerklund et al., 2020; Ferrara & Lecce, 2020). This study was framed by two concepts developed by Bjoerklund et al. (2020) within their integrating design across the organization model: (a) the concept of coevolving design capabilities and (b) the concept of the design-driven organization.

A joint research team developed the integrating design across the organization model (Bjoerklund et al., 2020) from the Design Factory, Aalto University School of Engineering (Finland), Aalto University School of Business (Finland), Stanford University Graduate School of Business (USA), and Idean Palo Alto (USA), to illustrate the coevolution of two types of design capabilities across a project management team: deep expertise in design practices and a comprehensive understanding of design capabilities. To build cross-functional team collaboration and effectively integrate design across organizations, engineers, managers, and designers must achieve a collaboration mindset between them, and the SME leader is called upon to drive achieving buy-in of design integration from their non-design staff (Bjoerklund et al., 2020; Wrigley et al., 2020). Without a practical roadmap of how to “sell” design processes horizontally, SME leaders may sabotage the cross-functional collaboration needed to adopt design thinking processes effectively (Ferrara & Lecce, 2020).

Bjoerklund et al. (2020) found scant scholarly work on the integration of design in an organization and thus framed their work by several practitioner frameworks, such as the Danish Design Centre's Design Ladder, the Artefakt's Design Maturity Matrix, the Design Value Scorecard, and the Design Management Staircase, that depict differences in the extent that design is integrated into organizations. The one theoretical study Bjoerklund et al. did cite in their work was Micheli et al.'s (2018) study on elevating the status of the design function within an organization from a "fringe" function to a legitimate one. Micheli et al.'s (2018) empirical study is grounded in organizational theory that emphasizes that obtaining legitimacy is essential for any entity (organization or a function) to ensure access to resources (Bitektine & Haack, 2015).

Micheli et al.'s (2018) study referred to organizational legitimacy theory as defining a function's status as its ability to exert power and influence over decision-making beyond task-related issues. Higher status functions have three core benefits: sustained resource attraction, authority over other functions, and influence over top management team attention and decision-making strategy. Micheli et al.'s study contributed to design innovation management theory in four ways: (a) proposing practices that enable the elevation of a function's status, (b) unraveling debates in the innovation management literature on conflicts between formalization and creativity, and between control and adaptability, (c) theorizing that pragmatic legitimacy of design must also include moral and cognitive legitimacy, and (d) providing future recommendations on how to elevate design's status in organizations. Bjoerklund et al. (2020) used Micheli

et al.'s study as a theoretical grounding in developing their integrating design across the organization model and theorizing on developing coevolving design capabilities within project teams to further cross-team collaboration within the design-driven organization.

## **Literature Review**

### **Design Thinking: Defined and its Unique Tools**

Design thinking is a systematic innovation method and can best be thought of as a user-centered approach that goes through an iterative process to improve a product, service, or process continuously (Brown, 2008; von Hippel, 2005). Several techniques and tools guide the first step to implementing a new idea. Design thinking still lacks a clear description of what it might take to enhance innovation (Nakata & Hwang, 2020). Definitions for the design thinking process range from a few core elements such as inspiration, ideation, and implementation to more exemplary steps such as understanding, observing, point of view, ideate, prototype, and test (Brown, 2008; Thoring & Mueller, 2011). Despite the lack of a clear definition for design thinking, three general phases can be identified: (a) needfinding, (b) idea generation, and (c) idea testing (Elsbach & Stigliani, 2018). Within each phase of the process, users' needs are put in the middle, where they remain the central consideration of the thought-of solution (von Hippel, 2005).

Design thinking is still relatively new and undefined (Nakata & Hwang, 2020). As one of the first authors, von Hippel (2005) described design thinking in his seminal work as a user-centered approach to innovation that creates a more appealing product at a

reduced cost. In the context of my research, design thinking needs to be understood as a creativity tool beyond product development: a strategic tool that can improve organizational learning by transforming a traditional organizational culture into the innovative culture of a learning organization. In previous research, authors identified design thinking as a promising concept for innovation, management, and organizational strategy (Brown, 2008; Micheli et al., 2019). In addition, current publications suggested that design thinking might be positively associated with organizational learning (Cousins, 2018a; Nakata, 2020).

Design thinking is a user-centered approach that goes through an iterative process to continuously improve a product, service, process, and beyond. Brown (2008) defined the design thinking process with three core steps: inspiration, ideation, and implementation. In each step, the end-user is the central consideration of the thought-of solution. Thoring and Mueller (2011) described the design thinking process with six steps: understand, observe, point of view, ideate, prototype, test. Each step puts the users' needs in the middle. Although different approaches describe design thinking with different steps, the overall process remains similar.

A collection of tools and techniques defines the systematic approach of design thinking. These design thinking tools present an innovative approach to problem solving and might be used individually to boost the innovative capacity of groups. Liedtka (2011) and Elsbach and Stigliani (2018) identified user-focused journey mapping, visualization, ideation, cocreation, and rapid prototyping as design thinking tools. Innovation managers

use journey mapping to visualize how customers and users experience the company's products and services. Visualizing the customer's journey allows one to empathize with the customers or users and promotes a user-centered problem-solving process. Managers use ideation techniques to maximize ideas from participants. Leaders frequently employ such design thinking tools in different techniques to foster innovative problem solving and decision making. Diversity is used in organizations to create an environment of cocreation and open brainstorming to boost innovation (Glaveanu & Taillard, 2018). Ideation by itself is associated with increased innovation (Cui et al., 2018).

Design-driven organizations maintain a competitive advantage through a value proposition driven by design and design thinking (Bjoerklund et al., 2020). Design thinking is the modern approach to innovation, in which user-centered considerations ensure useful and wanted solutions at reduced costs (von Hippel, 2005). Empathizing with customers and users allows design thinkers to truly understand what is needed and desired (Brown, 2008). Beyond creating desirable products and services for customers during product development, design thinking can improve internal organizational processes and workflows and overcome disruptive crises (Cankurtaran & Beverland, 2020; Kolko, 2015). Empathizing with internal users improves internal communication and services and, thus, increases organizational performance (Kolko, 2015). Design thinking can be a strategic tool beyond traditional product development and improve organizational learning (Brown, 2008; Elsbach & Stigliani, 2018).

## **Foundational Research on Organizational Culture and Design Thinking Tools**

An organization's culture is a critical component when leaders attempt to innovate and support or resist efforts to employ design thinking beyond essential product innovation (Carlgren et al., 2016; Elsbach & Stigliani, 2018; Rauth et al., 2014). Researchers found that traditional organizational culture might hinder an organization's innovative capacity and, thus, control whether leaders can successfully implement design thinking tools (Carlgren et al., 2016; Elsbach & Stigliani, 2018; Rauth et al., 2014; Sandberg & Aarikka-Stenroos, 2014). The key characteristics of organizations with traditional organizational cultures are rigid structures (strong hierarchies, existing power dynamics), outdated mental models, centralized decision making, and siloed specialization (Carlgren et al., 2016; Elsbach & Stigliani, 2018; Sandberg & Aarikka-Stenroos, 2014; Senge, 2006). Traditional companies' leadership focuses on improving at what they are good at with siloed specialization, incremental innovation, productivity, and tangible outcomes while resisting experimentation and collaboration (Carlgren et al., 2016; Elsbach & Stigliani, 2018).

### ***Innovation***

Regarding innovation in general, a traditional organizational culture may be limited to incremental innovation (Sandberg & Aarikka-Stenroos, 2014). Outdated mental models might not recognize the need for an organization to innovate radically and are shaped by theories-in-use that clash with innovation attempts (Carlgren et al., 2016; Senge, 2006). Driven by established standards and values, managers optimize processes

for incremental improvement and impede resources for more radical innovation, such as design thinking tools (Carlgren et al., 2016). In traditional cultures, personal learning, the critical essence of organizational learning, is perceived as unquantifiable regarding productivity and profit (Senge, 2006).

### ***Design Thinking Tools***

Regarding design thinking as a systematic and innovative approach, particular traits and structures in traditional organizational cultures were identified to hinder the usage of design thinking tools: The centralized decision making of leaders in traditional organizational cultures clashes with the consensus-driven design thinking approach (Carlgren et al., 2016). Strong hierarchies and centralized decision making inhibit unnecessary attributes like personal mastery, team learning, and systems thinking (Senge, 2006). Traditional organizational cultures that focus on productivity, performance, and specialized skills negatively impact integrating design thinking tools (Elsbach & Stigliani, 2018). Innovative design thinking methods collide with existing priorities, ideas, plans, and values (Carlgren et al., 2016). Existing power dynamics conflict with the learning curve associated with design thinking (Carlgren et al., 2016).

### ***Seminal Publications on Organizational Learning, Organizational Culture, and Design Thinking***

Organizational learning might be prompted by direct experiences or by the experiences of others (Levitt & March 1988). Learning opportunities that arise from differences between what the company should have done and the actual action is a direct

experience (Argyris & Schoen, 1978; Senge, 2006). In his seminal paper, Argyris (1995) studied the learning of individuals, groups, and organizations. The authors found that, surprisingly often, individuals' actions deviated from how they state their values and beliefs. Argyris called these the theory-in-use (what was done) versus the espoused theory (stated beliefs and values).

The author also identified this incongruency as an opportunity for organizational learning to re-evaluate stated beliefs and values or correct actual behaviors. Senge (2006) further explained in his book *The Fifth Discipline* that several factors are required to seize such an opportunity closing the gap between a theory-in-use and an espoused theory. Senge found that individuals need to have the level of personal mastery to recognize the gap and the empowerment, to tell the truth about it—otherwise, the opportunity for organizational learning is not recognized and ignored. Schein (2017) described organizational culture as a composition of espoused values, thinking habits, mental models, implicit standards and values, shared meanings, formal rituals, and additional ancillary components. All components range from observable to intangible and subtle for an outsider. The authors defined three levels of how organizational culture can be understood: The most tangible level describes artifacts. Artifacts can be behaviors and phenomena that can easily be observed. The second level is espoused beliefs and values that may or may not match what can be seen. The third level describes underlying basic assumptions based on intrinsic beliefs and values (Schein, 2017).

Argyris and Schoen (1978) were two of the first researchers to explore organizational learning and, in the context of organizational culture, identified Schein's (2017) second (espoused beliefs and values) and third level (underlying basic assumptions) as espoused theories and theories-in-use. Espoused theories describe standards and principles and how individuals believe they will behave. On the contrary, theories-in-use is the natural response to situations and reflect genuine intrinsic values. Senge (2006) described the culture of learning organizations using five disciplines, which provide fertile soil for organizational learning. Those disciplines are personal mastery, mental models, shared vision, team learning, and systems thinking.

For each of the five disciplines, Senge (2006) identified characteristics of traditional organizational cultures: traditional cultures perceive personal mastery as unquantifiable regarding productivity and profit, unchallenged, mental models are coined by theories-in-use that do not match the shared vision, and team learning and systems thinking are inhibited by strong hierarchies and centralized decision-making. Elsbach and Stigliani (2018) described traditional organizational cultures as focusing on productivity, performance, siloed specialization, rational decision-making, and tangible outcomes. Carlgren et al. (2016) stated that traditional cultures value existing processes, existing values, and strong hierarchies.

The learning organization model describes flexible and adaptable companies with a culture of experimentation and inquiry that helps them cope with changes in a turbulent environment (Argyris & Schoen, 1996). In learning organizations, managers deliberately

foster organizational learning with the help of adequate support structures, processes, and policies (Senge, 2006). Argyris and Schoen (1978) introduced the concept of learning organizations with their influential work. The authors described with this model an innovative company, able to adapt quickly to internal and external forces. Learning organizations continuously transform themselves in response to internal and external forces to remain competitive.

Argyris and Schoen (1996) further reviewed the literature for the definition of learning organizations in their succeeding publication. Depending on the focus of the literature piece, the authors found different descriptions for learning organizations: From a socio-technical aspect, the co-participation of employees influenced learning behaviors. Continuous development was associated with organizational learning when authors discussed organizational strategy and production processes. Economic development described learning as a closed feedback loop. Summarizing their literature review, Argyris and Schoen described learning organizations as flexible and adaptable organizations that manage to avoid stability traps and foster cultures of experimentation and inquiry. Without personal learning, there is no organizational learning (Senge, 2006). Senge (2006) expanded on Argyris and Schoen's model of learning organizations and defined the fundamental characteristics with the analogy of five learning disciplines: personal mastery, mental models, shared vision, team learning, and systems thinking; Senge intentionally used the term "discipline" to describe the primary characteristic as an endeavor deeply ingrained in the organization and deliberately applied.

### ***Personal Mastery***

Personal mastery is the first learning discipline with which employees practice self-actualization and growth through self-reflection (Senge, 2006). Employees with a high level of personal mastery can identify their strategic, creative, and logical work topics. Increased individual performance, improved self-efficacy, and healthier work–life balance present further attributes of personal mastery (Gregorzewski et al., 2018).

### ***Mental Models***

Mental models are engrained in the organization’s culture and tell employees what is expected of them—similar to Morgan's (2006) psychic prison in which people are trapped (Senge, 2006). Employees follow mental models and lead them to theories-in-use. Mental models emerge from assumptions, rules, and norms and describe, explain, and predict the behaviors of individuals and groups within an organization (Westbrock et al., 2019). If mental models are repeatedly challenged, organizations might develop skillful incompetence protecting the individual and the organization from learning opportunities (Argyris, 1995). Openness and merit characterize conversations in learning organizations and allow employees to productively manage existing mental models (Senge, 2006).

### ***Shared Vision***

Senge’s (2006) third discipline, the company’s shared vision, motivates employees by appealing to a higher purpose. Employees with purpose care and perform at their best but, furthermore, commit to excellence rather than merely comply. In their

research, Ken Kalala Ndalamba et al. (2018) argued that organizations with a shared vision are more profitable and viewed as more ethical. Shared visions in learning organizations recognize possibilities and create road maps to the future, describe a common purpose to encourage collaboration between employees, appeal to common ideals that motivate employees, and are lively to inspire others (Ndalamba et al., 2018).

### ***Team Learning***

Team learning is characterized by horizontal and informal communication between specialized groups and fosters mutual understanding, thus, improving group performance (Senge, 2006). Lastly, system thinking integrates the other disciplines and helps understand actions and implications in the long run for the company. Authors generally agreed that observed behavior could significantly vary from portrait beliefs and values (Argyris & Schoen, 1996; Schein, 2017; Senge, 2006). To this, Argyris and Schoen (1978) coined the terms of theories-in-use (what happens) and espoused theories (beliefs and values describing what should happen).

Schein (2017), who discussed organizational culture and leadership to a great extent, built on those terms with his model of organizational culture that described the level of artifacts, espoused beliefs and values, and underlying basic assumptions. Artifacts are policies, actions, and items that can be observed and extend to Argyris and Schoen (1978) theories-in-use. Espoused beliefs and values correspond to Argyris and Schoen (1978) espoused theories. Schein (2017) identified the level of intangible,

underlying basic assumptions to explain the eventual discrepancy between what can be observed and what an observer would expect to see.

Such discrepancy between espoused theories and theories-in-use creates an opportunity for organizational learning (Argyris & Schoen, 1996; Schein, 2017; Senge, 2006). Organizational learning enables innovation (Argyris & Schoen, 1996; Senge, 2006). In traditional organizational cultures, where leaders may neither have the personal mastery to recognize the discrepancy nor the mental model to close it, innovation is hindered (Carlgren et al., 2016; Senge, 2006). Despite a comprehensive discussion of authors on organizational learning's impact on innovative capacity, seminal research stops here. Seminal authors failed to address innovation in more detail, particularly innovation tools like design thinking: Argyris and Schoen (1978) identified the association between organizational culture and innovation but failed to discuss innovation in their initial or subsequent works in further detail. Schein (2017) focused on understanding organizational culture and how leadership can embed, grow, and reinforce culture. Innovation and design thinking are not discussed in the author's research. While Senge (2006) identified the association with organizational culture and organizations' innovative capacity, the author's work lacks a more detailed view on innovative tools such as design thinking.

### ***Recent Research on Organizational Culture and Design Thinking***

Organizational culture describes the work environment that shapes managers' and employees' thoughts, experiences, and actions (Warrick, 2017). The internal and external

components of an organization's shared beliefs, assumptions, and values shape organizational culture (Argyris, 1995; Argyris & Schoen, 1996; Schein, 2017).

Organizational culture supports existing structures and hierarchies and clarifies complex organizations (Warrick, 2017).

Carlgren et al. (2016) analyzed the challenges of implementing design thinking using a qualitative approach and found barriers to innovation specific to design thinking. The author found that traditional organizations' existing structures are inhibitors to innovation and design thinking. The lack of organizational flexibility, strong hierarchies, and reinforcing the status quo are barriers to innovative tools. Current mindsets fail to realize the need to innovate, leading to organizational rigidity, and tend to fall back on proven solutions rather than thinking outside the box in turbulent situations. This is similar to Senge's (2006) disciplines, where hierarchies obstruct team learning and create rigidity.

Elsbach and Stigliani (2018) agreed that traditional mindsets focus on tangible outcomes and time-sensitive solutions and limit design-oriented solutions. Argyris and Schoen's (1978) Model I described outdated mindsets creating an environment of self-defense, rigidity, and unsupportive organizational learning. Such existing mindsets also conflict with design thinking tools: Existing structures and processes designed to tackle an organization's day-to-day tasks prevent managers from finding the time to conduct the frontloaded and iterative design thinking process (Carlgren et al., 2016).

Not only does the body of literature confirm that organizational cultures can negatively impact the deployment of design thinking tools, but that the association can be quite positive (Beverland & Farrelly, 2007; Elsbach & Stigliani, 2018; Kolko, 2015). Authors widely agreed that specific key traits of cultures determine whether design thinking tools are supported or opposed. Elsbach and Stigliani (2018) found that cultures that value collaboration and experimentation support prototyping, co-creation, and customer journey mapping, all of which are design thinking components. Curiosity and cross-functional empathy value design tools such as design thinking (Beverland & Farrelly, 2007). Open conversation and participative collaboration between diverse actors are the sources of emerging design (Manzini, 2016). In design-friendly cultures, leaders empower employees to observe, reflect, take action, and accept initial failure on the road to success (Kolko, 2015).

Considering that organizational culture is a critical influencer for design thinking tools, the successful implementation of design thinking tools will require significant changes to an organization's culture and avoid management resistance (O'Hern & Rindfleisch, 2010). Elsbach and Stigliani (2018) not only identified the positive and negative impact of organizational culture on design thinking but confirmed the need for cultures to change to help managers implement design thinking tools. Elsbach and Stigliani (2018) further called for future research to learn from organizations supporting design thinking.

Despite the extensive discussion about organizational culture and the association to the successful implementation of design thinking tools, there is a lack of research on transforming an organizational culture that opposes design thinking to a culture that supports design thinking. O'Hern and Rindfleisch's (2010) and Elsbach and Stigliani's (2018) open call for research on change in organizational cultures in the context of design thinking tools remained so far unanswered. Beyond identifying six key attributes of learning organizations that support design thinking, Senge (2006) guided how practitioners could transform organizational culture. The question that remains is how, beyond the theory, this is achieved by leaders of organizations. Ongoing design thinking tools shape and transform organizational cultures into learning organizations (Elsbach & Stigliani, 2018).

### **Design Thinking Tools**

Managers follow a structured process and employ innovative tools during the three phases (needfinding, idea generation, and idea testing) within the iterative design thinking approach. Observations, interviews, visualized journey mapping, brainstorming, co-creation, experimentation, and rapid prototyping are the innovative tools of design thinking (Elsbach & Stigliani, 2018). Even though they might be used individually to boost innovation, they are combined in design thinking to shape a systematic and innovative approach to problem-solving and decision-making.

The needfinding phase comprises the stages of discovering and defining the problem (Elsbach & Stigliani, 2018). Design thinkers empathize in this phase with the

audience and develop deep insight through observation and interviews (Elsbach & Stigliani, 2018; Seidel & Fixson, 2013). Empathizing with the users and customers allows design thinkers to understand and learn (stage of discovering) about the problem first. The observations are more profoundly analyzed during defining the problem to define what is truly needed to mitigate or resolve the problem. Design thinkers use journey mapping throughout the needfinding phase to visualize how customers and users experience its products and services, empathize with users, and understand what they need (Elsbach & Stigliani, 2018).

Co-creation is an effective and innovative tool and is often used to enhance the interpretation of collected user feedback (Elsbach & Stigliani, 2018; Zhan et al., 2015). The design thinking tools are observation, interviews, customer journey mapping, and co-creation in the need-finding phase. The creative powers of structured brainstorming and co-creation are combined in the idea generation phase. The controlled environment of brainstorming sessions goes well with the systematic design thinking approach (Bonnardel & Didier, 2020). Design thinkers use brainstorming to develop new ideas based on the previously defined problem and how users could benefit from their implementation (Elsbach & Stigliani, 2018).

Scholars concur that co-creation in diverse groups is positively associated with increased innovative outcomes (Androutsos & Brinia, 2019; Glaveanu & Taillard, 2018). Co-creation can involve external participants such as suppliers and customers or include interdisciplinary, gender-diverse, or cross-cultural internal contributors (Androutsos &

Brinia, 2019; Glaveanu & Taillard, 2018). Human-centered framing and reframing the problem create alternative perspectives and practical solutions (Bjoerklund et al., 2020).

Brainstorming and co-creation are design thinking tools during the idea generation phase (Elsbach & Stigliani, 2018). Idea testing is the concluding step in the design thinking process that allows design thinkers to evaluate their ideas and receive instant feedback quickly. Design thinkers experiment with their ideas in this phase through rapid prototyping utilizing the full complement of design thinking tools (see Table 3). Prototypes are the manifestations of concepts to quickly test an experimental version of the developed idea (Elsbach & Stigliani, 2018). Design thinkers verify ideas' feasibility, viability, and desirability with experimentation and prototypes (Elsbach & Stigliani, 2018). The iterative mindset in design thinking projects improves the developed design solutions before agreeing on a final form (Nakata & Hwang, 2020).

**Table 3***Design Thinking Tools*

Phase	Description	Design Thinking Tools
Needfinding (Discovery)	Customers or end-users are observed and/or interviewed to collect feedback in the form of experiences. This phase creates empathy and deep insight into what the problem is.	observation, interviews
Needfinding (Definition)	The collected experiences are visualized in a customer journey map and make design thinkers walk in the shoes of their audience. Finally, the experiences are analyzed to reveal and define the underlying problem. Co-creation enhances this phase.	customer journey mapping, co-creation
Idea Generation	In brainstorming sessions and with the power of co-creation, ideas are generated on approaching the previously defined problems and the benefits for the users.	brainstorming, co-creation
Idea Testing	Testing of concepts shows quickly whether the model is feasible and meaningful	experimentation, rapid prototyping

*Note.* Adapted from “Design Thinking and Organizational Culture: A Review and Framework for Future Research,” by K. D. Elsbach and I. Stigliani, 2018, *Journal of Management*, 44(6), pp. 2274–2306.

Despite the known advantages of using design thinking as a strategic and innovative tool for problem-solving and decision-making, only 12% of organizations use design thinking at a strategic level (Bjoerklund et al., 2018). Design thinking is widely known and used by practitioners but rarely used beyond product innovation due to design thinking-specific barriers (Carlgren et al., 2016). Organizational culture has a significant impact on how successful design thinking can be implemented, and traditional cultures are often said to hinder innovative tools such as design thinking (Elsbach & Stigliani, 2018; Micheli et al., 2018).

### **Design Thinking Drives Innovation and Competitive Advantage.**

With the fourth industrial revolution and digitization age, it became vital for organizations to innovate to survive in our rapidly changing and chaotic environment (Brenner, 2018). SMEs are even more vulnerable due to limited resources and rely on an agile survival strategy (Naradda Gamage et al., 2020). Firms that successfully implement design thinking into their corporate strategy are believed to effectively meet this challenge by elevating innovation and, as a result, creating a competitive advantage. The Design Management Institute validated this understanding by showing that design-centric companies outperform the S&P by 211% (Design Management Institute, 2019). In the 2018 third-quarter report, McKinsey informed about a significantly higher growth in revenue (167%) and stakeholder return (131%) for design-led companies compared to industry benchmarks (Sheppard et al., 2018).

Scholars argued that competitive advantage draws from organizational knowledge and intellectual property as two critical elements (Brenner, 2018; Cousins, 2018a). Both components need to remain relevant and require organizations to innovate continuously (Brenner, 2018). Leaders most desire innovation to create competitive advantage and are driven by design thinking (Brown, 2008). In a literature review across 525 articles, Micheli et al. (2019) confirmed that academic researchers widely found that design thinking enabled organizations to drive innovation.

Integrating the compassion of end-users and reducing the fear of failing, design thinking leverages emotions to support innovation efforts (Nakata, 2020). The simplicity

of the design thinking approach enables practitioners to start with little experience, no coaching, and limited resources on lesser projects and still achieve remarkable results (Liedtka, 2020). Even though often advertised as an innovative tool for wicked problems, design thinking also produces positive results with well-defined problems (Nakata, 2020). Regardless of industry, size, sector, and environment, leaders can deploy design thinking to innovate (Nakata, 2020).

Although managers can use the design thinking process to innovate “as-is,” researchers argued that engraining design thinking deep into the corporate strategy would magnify the effect on innovation even more (Micheli et al., 2018). Design thinking helps leaders make critical strategic decisions, such as product branding, positioning, and tapping into new markets. Design thinking might positively influence strategic thinking, organizational learning, and further competitive advantage (Elsbach & Stigliani, 2018). Practitioners use design thinking to reshape their business models in digital transformations, combine organizational processes in mergers, and create new types of business models for startups (Gusakov, 2020). Design thinking allows managers to create meaningful customer experiences and transforms existing beliefs into an organizational culture that generates an innovative mindset (Ferrara & Lecce, 2020).

Bjoerklund et al. (2018) combined three evaluation tools in a multiple case study to determine the maturity of design integration within an organization and its effect on innovation. The authors found that the maturity of design thinking is positively associated with innovation within an organization. Bjoerklund et al. (2018) concluded that design

thinking is likely to create twice as much innovation compared to innovation approaches not utilizing the design. Cankurtaran and Beverland (2020) explored recent research on design thinking and its impact on innovation in organizations during the 2020 Covid-19 pandemic. The managers' ability to quickly challenge existing assumptions, develop solutions, and implement new practices with design thinking created resilience and competitive advantage (Cankurtaran & Beverland, 2020).

Practitioners empathize with customers, a fundamental step of design thinking, to understand customer needs, which is crucial for competitive advantage (Knight et al., 2020). Leaders need to insert design thinking into their corporate strategies as an ingrained habit to successfully create innovation from these collected data. Design thinking should be deployed using various data collection tools to maximize the impact of design thinking on innovation. Attention to discrete problems within this dynamic approach allows practitioners to gain in-depth insight, while collaborative practices create new knowledge about products and markets that suit the corporate strategy (Knight et al., 2020). While researchers commonly found additional benefits in innovation when the design was incorporated into organizational strategy, it can be argued that not doing so will result in short-sighted results. Organizations must create an environment capable of supporting design thinking and continuing design thinking efforts to achieve long-term benefits and, thus, secure competitive advantage. However, friction between departments, existing silo specializations, and static structures continue to present leaders with

challenges in successfully driving their firm's design thinking as an innovation strategy to support business (Wrigley et al., 2020).

### **Design Integration Challenges for SMEs Leaders**

Despite the documented positive impact of design thinking on innovation and competitive advantage, the concept is still novel, and only a few companies integrated design thinking to their full potential (Bjoerklund et al., 2018). In addition to the known hurdles of innovation, design thinking-specific barriers further hinder practitioners from employing design thinking beyond the scope of product innovation (Carlgren et al., 2016). Researchers identified several challenges regarding implementing design thinking: Organizations' prevailing focus on productivity, performance, siloed specialization, and rational decision-making disagrees with the design thinker's mindset of collaboration and experimentation (Elsbach & Stigliani, 2018). Incumbent firms develop rigid structures and processes and are likely to struggle with the experimental nature of design thinking (Nakata & Hwang, 2020). Their well-established rigid hierarchies, linear processes, and power dynamics are optimized for incremental improvements and disagree with the disruption of existing structures (Carlgren et al., 2016).

Deploying small, incremental changes, traditional managers make the company "better at what it is good at," refusing the radical nature of design thinking (Elsbach & Stigliani, 2018). The inability to easily associate a tangible benefit from design thinking exercises still appears to be one of the main hurdles for practitioners (Liedtka, 2020). Recognizing the positive effect of design thinking on innovation and competitive

advantage, practitioners in larger organizations, however, continue to work on the successful deployment of design thinking practices in their firms, leaving the managers of SMEs behind who are held back by internal resistance, financial restraints, lack of time, and shortage of academic guidance (Magistretti et al., 2020; Wrigley et al., 2020).

Naradda Gamage et al. (2020) identified the continuous competitive thread on a global market as a vital challenge to SMEs. Many SME leaders remain unsuccessful in embedding innovative design-thinking processes within their long-term strategy, placing these businesses at a disadvantage for long-term sustainability compared to their larger-sized competitors (Eide et al., 2021; Lattemann et al., 2020). Practitioners in SMEs struggle with innovation due to limited budgets, lack of resources, inability to scale up, inefficient technologies, and lack of knowledge (Naradda Gamage et al., 2020).

Design thinking is not intuitive and requires organizations to develop expertise and experiences (Sciotto, 2020). The design thinking process requires more resources in the early stages and more time due to its iterative nature than traditional linear problem-solving approaches. Design thinkers need to devote considerable time and extensive experience before successfully managing design thinking processes. For instance, the visualization across several steps within the design thinking experience is a novel concept and, thus, is often perceived as challenging to master (Carlgren et al., 2016).

Magistretti et al. (2020) explored design sprints, a design thinking variant, across 10 cases and found that time constraints and inadequate budgets limit SMEs' innovative capabilities. The authors further argued that the typical design thinking process might

need to be altered for SMEs to better match their competencies and organizational structures. Horizontal collaboration struggles with prevailing hierarchies and conflicts with existing power dynamics (Carlgren et al., 2016). In a two-year experiment, Lattemann et al. (2020) agreed that leaders of SMEs do neither have the resources to build design thinking knowledge nor the resources to apply design thinking. The radical nature of design thinking may cause stress on employees, who, in return, will resist design thinking attempts (Eide et al., 2021). Whereas larger organizations can afford championships driving design thinking, the ability to sell design thinking internally remains a demanding challenge for SME leaders (Ferrara & Lecce, 2020).

### **Design Integration Challenges for SMEs Leaders in the Manufacturing Sector**

Today, the SME manufacturing sector's sustainability and competitive market advantage are challenged by their larger-sized competitors' readiness to quickly adopt and apply innovative business models to support their strategic management goals (Khurana et al., 2021). Legal, environmental, and economic challenges require SMEs to innovate to remain sustainable (Khurana et al., 2021). Manufacturing SMEs, predominantly vendors for larger organizations, can use this necessity to create a competitive advantage over competitors during customers' vendor selection process. However, leaders of SMEs often fail to evaluate the sustainability performance of their firms (Zhang et al., 2021). Although sufficient research exists to guide larger firms, there is a lack of academic knowledge showing SMEs their way (Khurana et al., 2021).

Compared with larger organizations, SMEs face significant challenges that hinder them from innovating towards sustainability (Khurana et al., 2021; Wrigley et al., 2020). In a multiple case study across manufacturing SMEs, Wrigley et al. (2020) identified four key components to integrate design into manufacturing SMEs' strategy: strategic vision, facilities (physical spaces dedicated to design innovation), cultural capabilities (design competence), and directives (management support). In each researched case of manufacturing SMEs, the authors found a deficiency in at least one of those components and concluded that design integrations mostly fail to combine design interventions with prevailing operational activities. Limited funds do neither allow innovation practices nor investments into R&D and, in addition, make it problematic to access and find investors (Khurana et al., 2021).

Needed customer advocacy cannot arise in the limited spaces of smaller organizations (Wrigley et al., 2020). The needed labor force that is design-competent is attracted by larger firms resulting in low capabilities in SMEs. SMEs neither reach the critical mass of employees to create a diverse, inherent innovative environment (Khurana et al., 2021). The reduced labor force of SMEs further struggles to make the time for the frontloaded design process and prioritize innovative design activities and daily tasks (Wrigley et al., 2020).

SMEs' management support is essential in implementing changes emerging from design thinking activities (Wrigley et al., 2020). In family-owned SMEs, the inevitable realignment of the vision with the radical change often fails. SME leaders need to align

the strategic vision with the directives guiding employees and creating an adaptable, flexible, and informal organizational culture (Wrigley et al., 2020). Multidisciplinary teams are a foundation stone of collaboration and are needed to innovate because most underlying problems are complex, requiring the input of many perspectives and experiences (Gusakov, 2020). The desirable collaboration between design thinkers and other groups requires SMEs' management to improve communication and delivery (Roper et al., 2016). The lack of academic guidance for SME leaders on creating buy-in for such teamwork between departments makes just this a demanding task (Ferrara & Lecce, 2020; Roper et al., 2016). Although sufficient research exists to guide larger firms, there is a lack of academic knowledge showing SMEs their way (Khurana et al., 2021).

### **SME Leaders Driving Design Thinking Buy-In**

Scholars widely agreed in seminal and current research that design thinking is a driver of innovation (Ferrara & Lecce, 2020). Whereas leaders of larger organizations continue to convert this academic knowledge into practice, SMEs face various unique challenges to successfully adopt design thinking processes to create a competitive advantage (Naradda Gamage et al., 2020). Immediate and continued buy-in from a few managers and employees is essential to discourage prevailing habits and mindsets (Bjoerklund et al., 2020). SMEs' leadership support plays a central role in providing an environment supportive of design thinking and integrating design thinking into the corporate strategy (Wrigley et al., 2020). Wrigley et al. (2020) researched design thinking intervention in manufacturing SMEs and identified four essential components for a

successful integration merely controlled by SMEs' management. Besides providing the physical space to host innovative workshops and developing a design-knowledgeable workforce, the authors argued that the combination of strategic vision and directives is indispensable.

All components encourage employees to acknowledge the need for design thinking to innovate and, ultimately, remain relevant and get their buy-in. Especially in SMEs, leadership support is one of the essentials enabling design (Knight et al., 2020). Management in organizations enables investments and sets the directions (Micheli et al., 2018). The investment in physical space dedicated to design thinking activities demonstrates the commitment and the importance of design activities to employees (Wrigley et al., 2020). The unconventional appearance of design facilities sets them distinctly apart from employees' standard workspace, interrupts existing mindsets, engages emotions, and prevents distractions caused by standard business tasks (Elsbach & Stigliani, 2018).

Leaders of SMEs can develop internal design knowledge through training and use KPIs to measure progress (Wrigley et al., 2020). Design thinking skills to frame and reframe problems to resolve issues must be inherent in organizations to become design-led (Beckman, 2020). Gusakov (2020) stated that the built skills could further create motivation practices targeted towards using design activities within the firm. On the organizational level, SMEs can use the improved individual competencies to elevate their

capabilities on embracing uncertainty, experimentation, and disrupting prevailing mindsets (Ferrara & Lecce, 2020).

Although SMEs' leadership support is indispensable, a centralized approach can create employee resistance and, thus, sabotage the efforts (Micheli et al., 2018).

Collaboration between an SME's leadership, management teams, and employees creates bottom-up support, and a focus on human relationships provides the opportunity to develop shared goals (Wrigley et al., 2020). The co-creation of design-led vision and strategies creates excitement and buy-in from upper and middle management (Sciotto, 2020). Involving employees to develop design directives democratically builds employee support and commitment (Wrigley et al., 2020). The active inclusion of employees creates design champions who effectively sell the idea to their colleagues (Ferrara & Lecce, 2020).

### **Launching Design-Thinking Processes Within a Cross-Functional Team**

Multidisciplinary teams are a foundation stone of collaboration and are needed to innovate because most underlying problems are complex, requiring the input of many perspectives and experiences (Gusakov, 2020). Besides top management support, interdisciplinary collaboration is essential to elevate design (Knight et al., 2020). In itself, cross-functional groups play a significant role in elevating a firm's innovative capacity (Glaveanu & Taillard, 2018). Interorganizational collaboration enables complex feedback loops emerging from cultural and disciplinary diversity, generates a deeper understanding

of issues, creates innovation organically, and results in integrated solutions (Majchrzak et al., 2015).

The design thinker's holistic approach to solving wicked problems requires that each issue is analyzed from various perspectives to be understood (Dell'Era et al., 2020). The environment of collaboration and interdisciplinary viewpoints that present cognitive diversity to enhance creativity and innovation is one of the core characteristics of design thinking (Brown & Katz, 2011; Tsai, 2021). Therefore, integrating or elevating design thinking requires horizontal collaboration between departments (Bjoerklund et al., 2020). To foster collaboration between departments and design thinkers, SME leaders need to improve their message and delivery (Roper et al., 2016).

It needs to be mentioned that the diversity in cross-functional teams can also hinder innovation when the differences become insurmountable. Zhan et al. (2015) found that low levels of diversity spark creativity, but polarization dampens it and calls diversity a double-edged sword. Trischler et al. (2017) found that more substantial differences within teams require increased efforts to facilitate positive outcomes. Adverse team effects as discrimination, stereotyping, and micro-aggressions surface (Brody et al., 2017; Combs et al., 2019). De Bruyn (2020) identified the management and governance of cross-functional groups as the single most impacting factor for team performance. However, design thinking activities cross structural borders within organizations and are challenging to be directed from above (Bjoerklund et al., 2020).

It is, therefore, even more important that individuals get engaged in design thinking activities and become excited about collaboration (Dell’Era et al., 2020). When employees feel included in the decision-making on when and how design thinking activities are integrated, they become excited and engaged and buy into the idea to collaborate rather than resist (Sciotto, 2020). This cooperation between management and employees further builds employee support and commitment (Wrigley et al., 2020). The active inclusion of employees creates design champions who effectively sell the idea to their colleagues (Ferrara & Lecce, 2020). Adverse effects that could emerge from diverse groups can be avoided when the corporate vision is aligned with the directions to build a collaborative organizational culture (Wrigley et al., 2020).

Bjoerklund et al. (2020) expanded on that notion and identified elevating organizational design capabilities as crucial for collaboration. It is vital to introduce employees to design thinking fundamentals. If individuals fail to understand the basics of design thinking, they will not know when or how to collaborate. Bjoerklund et al. argued that design thinkers are either excluded from innovation or problem-solving activities, invited too late, or just declared bystanders in firms where design played a subordinate role. If managers were directed to administer design thinking activities, they lacked understanding from colleagues and, ultimately, faced reluctance to collaborate. Design thinkers often have to compromise to convince resistant stakeholders (Bjoerklund et al., 2020). Bjoerklund et al. agreed that employee engagement is essential but argued that

middle management was in an even better position to promote cross-functional collaboration.

### **Leading a Design-Centric SME and Turning a Profit: The Literature Gaps**

The continuous and rapid changes during today's fourth industrial revolution force organizations to innovate to survive (Brenner, 2018). SMEs are even more vulnerable due to limited resources and rely on an agile survival strategy (Naradda Gamage et al., 2020). External forces such as legal and environmental regulations or economic demands force manufacturing SMEs to continuously adapt and innovate (Khurana et al., 2021). Innovative manufacturing SMEs, vendors for larger organizations create a competitive advantage during customers' vendor selection process. Innovative tools such as design thinking are crucial to remaining competitive and, thus, are imperative to turning a profit. Design thinking enables firms to produce viable and desirable products that drive growth and profit (Bjoerklund et al., 2020).

Research has widely acknowledged the positive effect of design on profit: Design-led companies outperform the standard S&P by over 200% (Design Management Institute, 2019) and experience superior revenue and stakeholder return growth than industry benchmarks (Sheppard et al., 2018). Bjoerklund et al. (2020) believed that creating a design-led organization and fostering cross-functional collaboration positively impact the bottom line. Whereas many larger firms continue to adopt design thinking, manufacturing SMEs often fail to practice innovative activities due to limited resources and internal conflicts. SMEs have a smaller workforce that fails to attract fresh talents or

needed design experts. At the same time, a smaller workforce has less spare time to include new design activities into their day-to-day activities.

Whereas the academic body produced guidance for large-sized firms on integrating design thinking into organizational processes and strategies, there is a general lack of academic knowledge to show SMEs their way (Khurana et al., 2021). Current researchers suggested that a literature gap exists on how SMEs can successfully adopt design thinking within their long-term strategic management plan (Elsbach & Stigliani, 2018; Micheli et al., 2018). Because external forces require SMEs to adapt, further empirical research from strategy-as-practice scholars must fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020).

Insufficient practitioner and scholarly literature guides manufacturing SMEs on integrating design thinking activities successfully, leaving a literature gap on successfully driving design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (Mueller et al., 2020; Naradda Gamage et al., 2020). Future research has to fill the literature gap on developing productive cross-functional teams, an essential ingredient in innovation and adopting comprehensive design capabilities (Bjoerklund et al., 2020; Ferrara & Lecce., 2020). The extant literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can

practically advance collaboration across their cross-functional staff (Ferrara & Lecce, 2020; Roper et al., 2016).

### **Summary and Conclusions**

Chapter 2 included a synthesis and critical analysis of historical, seminal, and updated literature surrounding the concept of successfully driving design thinking within SMEs as an innovation strategy. Design thinking is a systematic innovation method and a user-centered approach that continuously goes through an iterative process to improve a product, service, or process (Brown, 2008; von Hippel, 2005). Although techniques based on seminal literature results offer techniques and tools to guide the process from the first step to implementing a new idea, design thinking as an innovations strategy still lacks a clear description of what it might take to enhance innovation (Nakata & Hwang, 2020). Definitions for the design thinking process range from a few core elements such as inspiration, ideation, and implementation to more exemplary steps such as understanding, observing, point of view, ideate, prototype, and test (Brown, 2008; Thoring & Mueller, 2011). Despite the lack of a clear definition for design thinking, three general phases can be identified: (a) needfinding, (b) idea generation, and (c) idea testing (Elsbach & Stigliani, 2018).

There is still little known about how SME business owners may successfully drive design-thinking processes within their firms as an innovation strategy to support business sustainability and competitive advantage while practically achieving buy-in from their non-design staff (Ferrara & Lecce, 2020). The extant literature on launching successful

design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020; Roper et al., 2016). The critical problem for SME leaders is the lack of research-based evidence on processes to adopt design thinking while remaining economically sustainable calls for further empirical research from strategy-as-practice scholars (Bjoerklund et al., 2020; Gusakov, 2020; Knight et al., 2020). Such empirical results exploring design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm to support business sustainability and competitive advantage may extend theory in the management literature and the study's conceptual framework (see Bjoerklund et al., 2020).

Chapter 3 presents the research method for qualitative multiple case study research. The recruitment, participation, and data collection procedures will be presented and applied to the current research strategy. The data analysis plan will be addressed, as well as the ethical procedures and trustworthiness of data within the study

### Chapter 3: Research Method

The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. To meet the purpose of the study and address this documented knowledge gap among manufacturing SME leaders and be consistent with the qualitative paradigm, a multiple case study design (see Yin, 2017) was used to collect data from a purposeful sample of design thinking experts. To successfully embed the design-thinking process in manufacturing, SMEs, leaders, engineers, and designers must cooperate to build cross-functional team collaboration (Wrigley et al., 2020). The extant literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can practically support design thinking buy-in from their nondesign staff (Ferrara & Lecce, 2020; Roper et al., 2016).

This study is significant to professional practice by informing business owners on integrating comprehensive design capabilities across their departments to drive cross-team collaboration in design-driven SMEs (see Bjoerklund et al., 2020; Ferrara & Lecce, 2020). My goal was to develop a subject matter expert study designed to extend theory and academic knowledge on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Eide et al., 2021; Lattemann et al., 2020;

Mueller et al., 2020). The open nature of expert interviews encourages emerging data from experts' breadth of knowledge and experience in research fields that remain under-researched (Littig & Poehhacker, 2014).

Chapter 3 provides a detailed presentation on the following: research methodology and design rationale, the participant selection strategy, the researcher's role in data collection and analysis processes and procedures, assumptions and limitations of the study, ethical considerations, and trustworthiness issues.

### **Research Design and Rationale**

To address the purpose of the study and drive the research strategy, Browne and Keeley (2014) wrote that a researcher asks the right questions. Consistent with the purpose of this study, the central research question (CRQ) was as follows:

How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?

To meet today's manufacturing market challenges, some large companies have employed design thinking methodology to develop an intimate understanding of customer needs (Beckman, 2020; Brown, 2008). The actual steps used in the design thinking methodology formulate a business culture, growth mindset, and design attitude across a firm's different units to come together into one cross-functional team working within a design-driven organization (Bjoerklund et al., 2020). The critical problem for SME leaders adopting design thinking to spearhead their innovation process while remaining

economically sustainable calls for further empirical research from strategy-as-practice scholars (Bjoerklund et al., 2020; Gusakov, 2020; Knight et al., 2020). Scholars recommend that empirical data be gathered to develop a practitioner protocol for SME owners on integrating comprehensive design capabilities across their departments to develop coevolving design capabilities between their design, management, and engineering teams (Bjoerklund et al., 2020; Ferrara & Lecce, 2020).

The nature of this study was qualitative to align with the purpose of the research (see Halkias & Neubert, 2020). When applied to an empirical investigation, the qualitative approach is consistent with the social constructivist paradigm (Bhatta, 2018). As an extension of the traditional social development theories, the social constructivist paradigm focuses on how people construct meanings from their daily life experiences. While the researcher might attempt to identify a statistical association between variables to test hypotheses, the purpose of my study was met by understanding and exploring human experiences and social phenomena (see Cooper & White, 2012).

Other qualitative designs were considered as a research design for this study (e.g., phenomenology and narrative inquiry) but were considered ineffective in answering the research question due to the methodological limitations of uncritical personal storytelling and exploring the meaning of lived personal experiences (see Merriam & Tisdell, 2015). With a recommendation from Yin (2017), the case study design is an approach to describe the phenomenon or explain the phenomenon's reasons. An exploratory multiple case study (Yin, 2017) was used to meet the study's purpose to understand better design

thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. The multiple case study is focused on exploring a phenomenon within real-world settings (Eisenhardt et al., 2016).

A multiple case study can involve individuals within a social context of the phenomenon as separate units of study (Stake, 2013; Yin, 2017). The design of multiple case studies includes the use of replication of different cases to collect data. In a multiple case study, a cross-case analysis begins by synthesizing details for a general explanation of the phenomenon after comparing the data collections from all cases for similarities and differences (Eisenhardt & Graebner, 2007; Yin, 2017).

To address this study's problem, the multiple case study and the selection of the cases were categorized into two types: *literal replication* and *theoretical replication*. In a multiple case 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 multiple case 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 to extend theory from cases within the management domain (Halkias & Neubert, 2020; Welch et al., 2020).

### **Role of the Researcher**

My role as a researcher included collecting, maintaining, and analyzing data and providing feedback to safeguard against undue bias throughout the research process. Given my researcher's role, I listened actively to participants and offered feedback through the semistructured interview process to create a detailed audit trail throughout the study process (see Mann, 2016). This role placed me as the primary instrument of the study, and I was responsible for managing any ethical dilemma and researcher's bias (see Merriam & Tisdell, 2015). The reflexivity process allows researchers to manage their bias by questioning their own, taken-for-granted assumptions through the reflexivity process by generating a detailed audit trail to support participants' perspectives (Merriam & Tisdell, 2015).

I managed my personal bias by offering various perspectives on the topic of interest in the literature review, including relevant seminal and current publications from different databases (see Dowd & Johnson, 2020). I further managed my bias by employing continuous peer-review, peer-feedback, and member checking. In my critical role as the primary instrument of this research, I attempted to prevent participants from being influenced unconsciously. I, therefore, provided clear instructions to the interviewees, clarified the topic of interest, and explained the scope of the research to be transparent without biasing them. Follow-up questions detailed and clarified the given answers to further explore the participants' perspectives. Comfortable interactions before, during, and after the interviews generated a rapport between the participants and the

researcher and created trust (McGrath et al., 2019). The interviewees' anonymity and data confidentiality were protected at any time to avoid ethical dilemmas and strengthen the trustworthiness of the study results. I carefully considered the cultural and power dimensions of the interview situation before the interview to avoid the process being perceived as invasive (McGrath et al., 2019).

### **Methodology**

Researchers choose a qualitative research methodology to explore and describe complex concepts and relationships and identify recurring patterns within the researched phenomenon (Tsang, 2013). The semistructured interview process resembles a guided conversation in qualitative studies and is mostly open-ended in case studies (Yin, 2017). Probing follow-up questions across different data sources increases the interview's originality (Yin, 2017). Scholars explore with case studies real-life phenomena in depth and include the environmental context in the investigation (Ridder, 2017). An event, organization, group, or even person can be identified as a case (Ridder, 2017; Yin, 2017). The multiple case study design allows the researcher to compare and contrast the collected data across the explored cases and provides valuable insight relating to each participant as a separate unit (Yin, 2017). Using replication logic in this study, I compared the collected data with each case as a separate experiment that stood on its own as an analytical unit (see Eisenhardt & Graebner, 2007). Comparing and contrasting multiple separate cases can lead to the generation of theory (Yin, 2017).

I employed a qualitative multiple case study as design, which allowed me to explore real-life experiences in all details (see Yin, 2017). The case study design is suitable for explanatory inquiries that ask “why” and “how” without control over the behavioral events to describe a contemporary phenomenon (Yin, 2017). When the qualitative case study is designed correctly, and the researcher chooses and applies the case study elements correctly, the approach becomes valuable in generating theory (Baxter & Jack, 2008). The study consisted of multiple holistic cases involving one unit of analysis per case. Yin (2017) argued that the collected data from multiple cases might result in a more robust study than a single case study. Exploring multiple cases allows the researcher to differentiate between case-specific findings and findings shared across several cases, and conclusions based on varied empirical evidence tend to be more robust (Eisenhardt & Graebner, 2007). Theories generated from multiple cases tend to be more accurate, generalizable, and testable than single case studies (Eisenhardt & Graebner, 2007). Treating each case as a separate study, the cross-case synthesis approach strengthens the data’s external validity and trustworthiness, leading to more robust findings (Merriam & Tisdell, 2015; Yin, 2017).

Using purposeful sampling in this qualitative research, five to 10 participants should reach data saturation and identify emerging themes and ideas (see Merriam & Tisdell, 2015). I interviewed seven design thinking experts before data saturation was reached. Interviews were a primary source to collect the required data to meet the purpose of the study (see Halkias & Neubert, 2020). The interview questions were

developed to collect rich data and a deep understanding of the experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. A multiple case study includes research questions, interview questions to explore experts' views, the participation selection logic, data collection, analysis methods, and a template to report the findings (Halkias & Neubert, 2020).

Triangulation can increase validity and reliability (Farquhar et al., 2020). Triangulation may also further the study's scope, depth, and consistency (Flick et al., 2004). Data triangulation increases the construct validity of research projects by managing the measures of the various data sources (Halkias & Neubert, 2020). Researchers use triangulation to compare and contrast the collected data across various data sources, manage bias from individual data sources, and balance viewpoints to strengthen the validity and quality of the study (Guion et al., 2011; Yin, 2017). I used semistructured interviews (see Halkias & Neubert, 2020), archival data, and reflective field notes (see Merriam & Tisdell, 2015) were used to enhance the trustworthiness of the multiple case study findings through data triangulation (see Farquhar et al., 2020).

The research method and design define the research elements in case studies (Yin, 2017). With multiple cases, a case study protocol comprising the instrument, the procedures, and general rules becomes fundamental for the researcher to adhere to those elements (Yin, 2017). Generating and following the case study protocol helps the scholar follow the established procedures and rules for each case and strengthens the synthesis of

collected data across the separate cases and the study's trustworthiness (Maryl et al., 2020; Stake, 2013). The case study protocol should include an overview of the research project, the field procedures, the case study questions, and a guide for the case study report (Yin, 2017).

### **Participant Selection Logic**

#### ***Population***

Given that the study purpose called for a detailed description of design thinking experts' views, the population from which I selected this study's participants was academics/authors of peer-reviewed papers and practitioner business reports. The experts' scholarly and professional works had to be published in reputable, scientific journals within the subject area of design thinking in small and medium-sized manufacturing firms as an innovation strategy to support business sustainability and competitive advantage, indexed on Google Scholar between 2011 and 2021. Such peer-reviewed scholarly publications totaled approximately 13,700 (via Google Scholar). I recruited seven participants from this population as the purposeful sample for this multiple case study. The sample size was on the lower end the recommended range of six to 10 participants for a qualitative multiple case study, but the richness of the collected data was sufficient to reach data saturation (see Halkias & Neubert, 2020; Schram, 2006).

#### ***Sampling Strategy***

Using replication logic is fundamental to case studies (Eisenhardt & Graebner, 2007). The concept of replication logic allows the researcher to replicate, contrast, and

extend on each case, which is treated as a different experiment, independent from the other cases (Yin, 2017). Unlike laboratory experiments, case studies consider the real-world context in which the cases are embedded. The nonexperimental nature of case studies makes replication logic a suitable tool to meet the purpose of the study of gaining a deeper understanding of design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy (see Eisenhardt & Graebner, 2007).

In reference to studies, cases are selected to offer insight into the study's topic of interest, and purposeful sampling is appropriate (Eisenhardt & Graebner, 2007). I used purposeful sampling and network sampling to recruit participants for the study. Purposeful sampling is based on inclusion and exclusion criteria and allows the researcher to focus only on organizations and participants that suit the framework and contribute to the research purpose (citation). The recruited seven candidates were sufficient to reach data saturation, and I did not have to employ snowball sampling to ask qualifying participants for additional relevant contacts (see Merriam & Tisdell, 2015).

### ***Sampling Criteria***

Expert interviews are considered a standard research method in the qualitative paradigm (Bogner et al., 2018). Experts possessed the specific knowledge that helped me meet the study's purpose (see Bogner et al., 2018). I recruited seven design thinking experts who met the following inclusion criteria: (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and

2021 when undergoing a word search under the terms design thinking, SME, innovation strategy, business sustainability, and competitive advantage; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam & Tisdell, 2015). The participation selection inclusion criteria ensured that the participants, recruited and interviewed, possessed the special knowledge as experts for the study's topic of interest and had relevant information helping meet the research purpose (see Bogner et al., 2018).

### ***Sampling Selection***

The process for identifying and selecting participants to gather their views was through semistructured interviews that fulfilled the study's purpose of an in-depth investigation of the phenomenon under investigation (see Tracy, 2019). I searched for qualified participants employing a network sampling strategy and using the inclusion criteria during the sampling process. The researcher must follow five goals using purposive sampling: find representativeness for the topic of interest, represent variation and demonstrate heterogeneity, identify cases that are meaningful to the research purpose, identify differences and similarities between the selected cases, and find cases and interviewees that help to answer the research question (Maxwell, 2012). Contrary to quantitative logic, each case is selected because it is 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 purposeful selection sampling. Purposeful sampling allows multiple-case researchers to maximize heterogeneity across participants. Increased heterogeneity within the participation pool contributes to an improved understanding of the central study topic (Baxter & Jack, 2008). Purposeful sampling allows the researcher to deliberately choose certain people, scenarios, and contexts to answer the research questions (Maxwell, 2012). Selecting the sample through maximum variation sampling is essential to explore variations between cases and is the preferred sampling mode for the constructivist inquiry (Halkias & Neubert, 2020).

### ***Sample Size and Saturation***

In qualitative research, planning the sample size before the data collection is problematic due to the unknown number of ideas and themes that might emerge, determining when data saturation will be reached (Sim et al., 2018). Although there are few practical guidelines for sample sizes, enough participants need to be interviewed to reach data saturation (Guest et al., 2006). The recommended sample size in qualitative studies varies widely to keep the study manageable and achieve data saturation (Baker & Edwards, 2012). Lincoln and Guba (1985) recommended a sample size between 12 and 20 interviewees. Bernard (2013) argued that 10 knowledgeable participants could sufficiently reveal necessary themes and achieve data saturation. Guest et al. (2006) suggested that as little as six interviews can be enough to achieve data saturation. Data

saturation is achieved when the relative frequency of codes is stabilized, and further data points will not change the results of a study (Guest et al., 2006).

I interviewed seven participants for this multiple case study before reaching data saturation. Interviewing experts allowed me to collect rich, in-depth data that helped to quickly achieve data saturation (see Fusch & Ness, 2015). Rich data can be understood as detailed, nuanced, and multilayered information with qualitative depth (Fusch & Ness, 2015). I actively selected the most potential candidates to produce rich data and generate the information needed to meet the study's purpose from the pool of participants. I engaged with the chosen participants to build a strong rapport and gain an in-depth understanding of the phenomenon (see McGrath et al., 2019). The selected candidates were then invited to expert interviews to increase the credibility and dependability of study findings. To ensure that rich data emerged from the interviews, the individual interviews took place in a confidential setting in which the participants could freely share their experiences without distraction and where their privacy was protected. Semistructured questions with the option for follow-up questions fostered insightful and intricate conversation (Tracy, 2019).

The participant selection logic was developed from similar studies that generated detailed insight from expert interviews. For example, Haselbock et al. (2018) interviewed 10 microservice design experts to determine which design areas are relevant for microservices, how important they are, and why they are essential. In a similar paper, Costa et al. (2018) interviewed 10 design experts from the industry and the educational

sector in games, human-computer interaction, psychology, and aging studies to explore how to encourage active aging and healthy lifestyles. In 60-minute semistructured expert interviews, Amano (2019) selected and interviewed four design and innovation experts about the prototyping in business model innovation. In another expert interview study, Seifried and Wasserbaech (2019) conducted eight semistructured expert interviews to learn about the implementation of design thinking and the architecture of related office spaces. Theory-generating expert interviews allow researchers to access experts' professional and personal experiences and provide rich answers that will help meet the proposed study's purpose (see Doeringer, 2021).

### **Instrumentation**

The goal of instrumentation in a case study is to collect data from multiple sources through protocols and processes deemed valid and reliable to answer the research questions posed in the study (Yin, 2017). Choosing or developing instrumentation that aligns with the purpose of the study and the conceptual framework is an essential process for qualitative studies (Merriam & Tisdell, 2015). Themes will emerge after data are analyzed, collected through the appropriate choice of instrumentation with the end goal of describing design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

The three sources of data collected throughout this study were as follows: (a) a semistructured interview protocol (Appendix B), (b) archival data in the form of

practitioner-based business reports on implementing design thinking as a business strategy (see Yin, 2017), and (c) reflective field notes (Merriam & Tisdell, 2015), which I kept throughout the data collection and analysis process. The study results stemmed from a carefully executed and rigorously planned data collection procedure to answer the study's CRQ: How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?

Triangulation plays a systematic approach during the qualitative research process for confirming or contradicting data (Guion et al., 2011). This research used multiple sources of evidence during the data collection process. Data triangulation from multiple sources can ensure the dependability and rigor of a multiple case study's results (Halkias & Neubert, 2020). Triangulation of data sources was conducted to establish trustworthiness in the study's data analysis (see Farquhar et al., 2020; Merriam & Grenier, 2019).

### ***Semistructured Interview Protocol***

The primary tool used in this research was semistructured interviews with open-ended, focused interview questions asked of the participants (see Yin, 2017). The semistructured interview centered on seven well-chosen questions grounded in the conceptual framework and the reviewed literature presented in Chapter 2 (see Rowley, 2012). Potential participants were asked of their availability interview via a recruitment letter (Appendix A) that informed interviewees of the nature and purpose of the research.

An informed consent form was provided to potential participants to inform their research participants' rights. I used a semistructured interview format (Appendix B) to be completed in approximately 30 minutes (see Yin, 2017).

A preliminary field test and a quality audit were conducted to determine whether the study's interview question items would produce results to answer the central research questions (see Tracy, 2019). The field test auditors included the Dissertation Committee Chair and two subject matter experts to determine the credibility, dependability, and applicability of the interview guide's questions and the interview procedures (see Golafshani, 2003). The three field test auditors—Dr. Daphne Halkias, the Dissertation Committee Chair; Dr. Bradley Cousins, Professor of Management, University of Louisiana (USA) and CEO of *10X Strategy Design & Leadership Development*; and Dr. Alfredo de Massis, Professor of Entrepreneurship, Free University of Bolzano (Italy) & Lancaster University (UK)—have published peer-reviewed scholarly papers as well as having practitioner experience in the domain of design thinking and product innovation in business organizations (Cousins, 2018b; De Massis et al., 2018; Thomason & Halkias, 2018). This field testing supports the trustworthiness and credibility of the study's qualitative findings (Guba & Lincoln, 1994).

In a qualitative study, the instrument's validity is dependent on the potential for transferability of the study's findings. Transferability is related to external validity; both concepts are associated with how much the reader can infer if the findings of a study apply to other contexts or situations (Merriam & Tisdell, 2015). For many qualitative

studies, transferability is a challenge because the findings are bound to specific settings and individuals; therefore, it is reasonable that the results of this study may not apply to populations beyond the participation group (Stake, 2013).

### ***Archival Data***

Triangulation is an essential component in case study research and an investigative approach used in addition to thorough data analysis in field research (Yin, 2017). Triangulation in qualitative research compares and contrasts data and adds depth to the collected data (Guion et al., 2011). In this study, the collected data from the interviews were triangulated with a few archival documents. Archival data in the form of practitioner-based design thinking reports were used. I also examined additional databases regarding design thinking as an innovation strategy combined with SMEs' business sustainability and competitive advantage. These two archival data sources were used for triangulation to answer the research question and support credibility and trustworthiness to the study's findings. Related qualitative multiple case study research questions by Neubert (2016) and Komodromos (2014) have also been answered using archival data to triangulate interview data.

### ***Reflective Field Notes***

Field notes are a core component to maintaining rigor in qualitative research and increasing the collected data's richness (Phillippi & Lauderdale, 2018). The qualitative design of the study and the nature of the research question defines how reflexivity through field notes allows the researchers to freely observe using reflective data

collection (Alvesson & Sköldbberg, 2017). The reflective field notes taken during the semistructured interviews were the third instrument for the data collection. The researcher's reflexivity can be managed during virtual interview sessions such as Zoom. Using a virtual communication tool allows the researcher to connect with participants despite dispersed locations and creates a neutral, unbiased interview environment (Janghorban et al., 2014; Yin, 2017).

Online data collection may consist of interviews, interaction, and self-observation (Kozinets, 2019; Merriam & Tisdell, 2015), considering that most online data are documented and saved as they happen in real-time. Reflective field notes and journaling provide the researcher with more available information about the interaction within the naturalistic research setting of the online interview (Kozinets, 2019). Aligning with standard practices in investigations driven by the multiple case study design and research method, netnographic field notes were used as a triangulation prompt during the process of data analysis (Halkias & Neubert, 2020; Kozinets, 2017). Transferability drives this study's instrumentation's trustworthiness to offer results that may apply to sample groups in a different context or setting (Merriam & Tisdell, 2015). Transferability can motivate researchers to carry out future multiple case studies on this investigation's specific topic to extend further theory and knowledge (Stake, 2013).

### **Procedures for Recruitment, Participation, and Data Collection**

A sample size between six and 10 participants was initially considered for comprehensive interviews in this qualitative multiple case study (Fusch & Ness, 2015).

Data saturation is achieved when the relative frequency of codes is stabilized, and further data points will not change the results of a study (Guest et al., 2006). After interviewing seven participants, no new themes emerged, and data saturation was achieved. A total of seven design thinking experts were recruited who met the following inclusion criteria: (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and 2021 when undergoing a word search under the terms design thinking, SME, innovation strategy, business sustainability, and competitive advantage; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam & Tisdell, 2015). The identified experts yielded rich data to achieve data saturation (see Fusch & Ness, 2015). I confirmed that LinkedIn would not retain the participants' identities or any rights to the data provided. The minimum number of interviews conducted for a multiple case study is five participants, and I continued past this number until I reached data saturation, which was seven participants, with similar data noted from Participants 5, 6, and 7 (see Halkias & Neubert, 2020; Schram, 2006).

I used Google Scholar to search and identify design thinking experts who can meet the study's purpose. LinkedIn further identified experts who met the inclusion criteria and served as a recruitment tool to create the initial contact. I posted a recruitment letter to the potential candidates in sequential order and asked them to be contacted via LinkedIn messaging or via email, which I disclosed in the message if they were interested in participating in the study. Interested experts then responded with "I consent" before the

scheduled interviews. The interviews were conducted using the virtual Zoom conference tool. Expert interviews via virtual meeting rooms are viable if face-to-face interviews cannot be conducted due to time restrictions or budgetary restrictions (Bogner et al., 2018).

Despite their relatively recent introduction to academic research, expert interviews became increasingly popular in social science research and are frequently considered a standard qualitative research method (Bogner et al., 2018; Littig & Poehhacker, 2014). Qualitative expert interviews are commonly used across various disciplines such as politics, organizational research, sociology, international relations, and politics (Flick, 2018). In exploratory studies, expert interviews are more efficient in generating the desired data than alternative methods (Bogner et al., 2018). During the expert interviews, the participants shared how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. Even though the interview format was semistructured, the nature of exploratory expert interviews remained open to generate rich data from the experts' knowledge and experience in a poorly understood field (see Littig & Poehhacker, 2014). Rich data can be understood as detailed, nuanced, and multilayered information with qualitative depth (Fusch & Ness, 2015).

Immediately after receiving Walden University's Institutional Review Board (IRB) approval, I started with the participant recruitment process: I reached out to every potential participant in sequential order and invited them to participate in the study. A

consent form attached to the recruitment email included (a) an explanation of what the study entails, (b) the option to withdraw, (c) the procedure, (d) possible risk or discomfort associated with participation, (e) the time limit, (f) a statement of voluntary participation and no consequences for refusal, (g) rights to confidentiality, and (h) the benefit of this study for SME leaders and managers by guiding them to successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. I then invited those participants who responded with interest to my recruitment letter (Appendix A) and asked them to provide their email addresses.

The primary goal of this qualitative expert interview method was to gain a detailed understanding of the experts' comprehensive knowledge and experiences. To generate pertinent data and to meet the study's purpose, I focused during the interviews on the relevant knowledge and experiences the experts have to offer regarding the research topic. The expert interview protocol included open-ended questions that I designed to align with the topic of the research and to create insight into experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Yin, 2017).

The approval from Walden University's IRB was imperative for the expert interview. Once IRB approval was received, I conducted seven interviews during the data collection process. The interviews lasted between 21 and 69 minutes and were recorded in the Zoom application. My cell phone hosting the Otter.ai mobile application and a

digital voice recorder served as backup (see *Otter Voice Meeting Notes*, n.d.). I used reflexive journaling notes for additional reflection (Stake, 2013). The Otter.ai application saved and managed the recorded interviews and transcribed the conversation into editable texts (see *Otter Voice Meeting Notes*, n.d.). I then used Microsoft Word and Microsoft Excel to collect, organize, categorize, and analyze the data collected from all interviews. Microsoft Excel is a suitable tool for researchers to manage the collected data by storing the data, using thematic analysis, and categorizing the information (Tracy, 2019).

I concluded each Zoom interview with a “thank you” to the participants and reminded them that I would contact them again to clarify the collected data further if needed. I reiterated that the participants’ identities will remain anonymous and that the collected data will stay confidential. All recorded interviews and reflexive notes were saved on my password-protected laptop that was encrypted and behind a secure firewall. A data backup was stored on a password-protected and encrypted USB stick and Google Drive, secured by a strong password. After the transcription of the interviews, I contacted each expert individually, shared the transcription of their interviews, and asked them to review and validate their responses through the review process within 72 hours (see Mero-Jaffe, 2011). The quality of transcripts is critical within qualitative research as they are the evidence from which the data are analyzed (Davidson, 2009). This interview transcript review helped identify and correct errors and clarify unclear responses.

### **Data Analysis Plan**

When conducting the interviews, my primary responsibility was to know the amount and the type of data needed and manage the interview to yield quality-driven responses (Jacob & Furgerson, 2012). The interview contained questions that revealed authentic and relatable trends among the interviewees and connected to the qualitative study's overall purpose. The design thinking experts were the unit of analysis for this study. The data collected were categorized with the information gathered from the semistructured questions. In reaching the study's conclusions, I analyzed what the interviewees have said, examined the data set for patterns while reviewing and integrating the differences across multiple sources of data for purposes of triangulation (Merriam & Grenier, 2019; Yin, 2017).

A data transcription was developed, analyzed, coded, and categorized using the Microsoft Excel Spreadsheet (Yin, 2017). In developing a case study database, identified themes, words of significance, viewpoints, and documented work were analyzed and organized using thematic analysis to develop the models and themes from the data (Yin, 2017). I conducted my study's data analysis phase in two stages. Whereas the first stage consisted of a within-case analysis of each selected case, the second stage entailed a cross-case analysis of data to seek similarities and differences across the categories and themes (Yin, 2017). Regarding individual within-case analysis, data collected from transcribed interviews and field notes were arranged in segments, indexed with line numbers, and arranged in line with the interview questions for ease of identification of

codes and to capture emerging patterns (Saldaña, 2016). Codes sharing common meanings were classified into categories and themes (Saldaña, 2016).

The descriptive coding method was the basic analytical technique for this study and is appropriate for novice qualitative researchers who are still learning how to code qualitative data. The descriptive coding method symbolically assigns meanings to data segments, provides an inventory of words or phrases for indexing, and categorizes the data (Saldaña, 2016). Although there is more than one way to analyze qualitative data (Maxwell, 2012), I have chosen thematic analysis to analyze the data collected to answer the central research question. Qualitative data analysts code “fracturing” data by rearranging texts to compare items within the same category (Maxwell, 2012). Codes are used to capture words and phrases that share the same meaning, whereas categories connect them (Maxwell, 2012).

### **Issues of Trustworthiness**

#### **Credibility**

As an essential component in research, credibility presents the internal validity of a study’s findings and determines how congruent the findings are with how the participants see reality (Lincoln & Guba, 1985; Merriam & Tisdell, 2015). Researchers strengthen credibility with strategies comprising prolonged engagement, persistent observation, triangulation, peer debriefing, member checking, negative case analysis, reflexive journaling, and referential adequacy (Lincoln & Guba, 1985). I strengthened this study by thoroughly studying the literature to understand the matter and created an

interview protocol that yielded rich data and reached data saturation. The transcripts of the interviews were shared with the participants to be checked and verified to increase the validity of the data collection (Birt et al., 2016; Mak-van der Vossen et al., 2019). When the participants agree with the researcher's interpretation, credibility is achieved (Toma, 2011). Field tests with subject matter experts ensured that the interview questions were meant for the interviewees and relevant to meet the purpose of the study.

Part of ensuring credibility means achieving saturation without compromise. Hence, I did not want to seek out candidates to simply reach saturation, which would induce bias and cause research to default against trustworthiness criteria (Anney, 2014). The minimum number of interviews conducted for a qualitative multiple case study should be five participants, and I continued past this number until I reached data saturation, which was seven participants, with similar data noted from participants 5, 6, and 7 (see Halkias & Neubert, 2020; Schram, 2006).

### **Transferability**

Transferability refers to the external validity (or generalizability) of the study's results and how these findings can be transferred to another context (Morse, 2015). Besides gaining a detailed understanding of human experiences, discussing generalizability in qualitative, theory-building research makes sense (Carminati, 2018). Generalizability depends on the settings and relies on the researcher's understanding on knowledge of the context (Carminati, 2018; Yin, 2017). Researchers must be aware that their subjectivity and bias shape the collected data's interpretation and influence the

findings (Paraskevas & Saunders, 2012). Member checking strengthens the transferability of the study by ensuring that the co-constructed knowledge presented in the research's findings offers the participants' view independent from the researcher's bias (Birt et al., 2016).

Rich, thick descriptions of the collected and analyzed data will help readers transfer the study's findings to another context (Carminati, 2018). Thick descriptions, member checking, prolonged engagement, observation, triangulation, member checking, audit trail, and reflexive journaling will preserve the interpretations and findings (Houghton et al., 2013). Providing a complete and detailed description of the research parameters allows conclusions on the broader context (Shenton, 2004a). Purposeful sampling enables researchers of qualitative studies to gather rich data from expert interviews (see Paraskevas & Saunders, 2012).

Methodological rigor remains essential through the entire qualitative research process, and the research process, along with the researcher's role and understanding of knowledge, must be thoroughly described to ensure the transferability of the findings (Anderson, 2017; Carminati, 2018; Delmar, 2010). I employed a purposeful sampling strategy to identify and recruit experts such as academics and authors of peer-reviewed papers published in reputable scientific journals with the design thinking domain on Google Scholar between 2011 and 2021. The careful selection of the participants allowed me to reach data saturation with a small sample group of experts: The expertise of the group yielded thick descriptions and rich data, and the variation of personal biases

remained controlled without diminishing the accuracy and generalizability of the study's findings (Hasson & Keeney, 2011; Morse, 2015).

### **Dependability**

In qualitative research, dependability accounts for stability factors within the research study and measures how steady the research results are if the study were repeated within the same parameters (Lincoln & Guba, 1985; Shenton, 2004b).

Dependability describes the consistency of the study's results with the data collection and reflects the possible replication of the findings using different strategies (Merriam & Tisdell, 2015). A detailed audit trail that includes the raw data, a documented process of data reduction, analysis, synthesis, and reflexive journaling ensures the study's dependability (Lincoln & Guba, 1985). Researchers can further strengthen dependability using triangulation and a stepwise replication of the data analysis (Morse, 2015).

Amankwaa (2016) suggested that researchers create a protocol with dates and activities related to credibility, transferability, dependability, and confirmability to ensure the study's trustworthiness. This trustworthiness protocol must align with the research gap, problem statement, research questions, methodology, and research design, to strengthen the study's rigor. Following Amankwaa's recommendation, I created a methodological procedure and an audit trail that described the decision made and actions taken during the data collection phase to ensure the dependability of the research. Maintaining the chain of evidence supports the alignment between the research steps and creates a link between the findings and the research question (Yin, 2017).

## **Confirmability**

Confirmability is defined by the consistency between data, interpretations, findings, and conclusions of research projects based on the participants and not influenced by the researcher's bias, motivation, or interest (Amankwaa, 2016; Lincoln & Guba, 1985). Confirmability describes the objectivity in the research project and can be assessed by employing triangulation and maintaining a detailed audit trail (Hasson & Keeney, 2011; Morse, 2015). In addition to the audit trail, Berger (2015) argued that the researcher's reflexivity strengthens confirmability. Researchers need to be aware of their own bias, accept their role as researchers, not experts, and prepare objective interview questions (Morse, 2015). An imperative component of reflexive journaling is social and emotional positioning, which allows the researcher to truly preserve the interviewees' voice (Berger, 2015). Strategies such as audit trails describing in detail every step of the study, triangulation validating the findings and consistency, and researcher reflexivity strengthen the confirmability of the study (Amankwaa, 2016). I managed the confirmability of the study by documenting my assumptions, beliefs, and emotional experiences in a reflective journal throughout the study and ensured a transparent data collection.

## **Ethical Procedures**

Walden University's IRB approval was mandatory for the study to begin with the recruitment and data collection process. In this section, I described how anonymity and confidentiality were addressed, identified potential risks and benefits for participants,

provided contact information of the IRB, and described other requirements. I began recruitment after the approval of the IRB had been received. I sent invites via LinkedIn (Appendix A) to potential candidates, design thinking experts, asking for participation in my study. The invite included the IRB approval number. Using the same LinkedIn platform, candidates responded to my invite if they were interested in participating. The approach promised the participants' privacy and confidentiality and confirmed that the potential participants met the inclusion criteria of the participant selection process.

After the candidates confirmed their qualifications based on the selection criteria, they accepted the conditions and terms described in the informed consent. Zoom interviews were scheduled after the participants responded with "I consent" to the informed consent form. I also asked for the candidates' email addresses to reach out during the study if needed. Each participant received an email confirmation from me about the scheduled Zoom date and time for the interview.

Researchers are responsible for maintaining the ethical procedures within research involving virtual components, such as respecting participants' privacy, protecting the confidentiality of data, and avoiding harm (Kantanen & Manninen, 2016). I reminded the candidates that their participation is voluntary, their privacy will be protected along with the data collected during the interview and explained the do-not-harm principle. Each eventual question, concern, or issue was addressed individually with the participants via email to avoid any form of miscommunication. The more participants understand how

their collected data will be protected, the more willingly they share their experiences (Tracy, 2010).

The IRB approval establishes the do-not-harm principle. To the best of my knowledge, I did not experience ethical concerns in the recruitment process or data collection for this research project. The potential candidates were informed that their participation only required their expert knowledge as design thinkers, academics, and authors of peer-reviewed papers, and their organizational belonging would be irrelevant for the study. The provided informed consent form described the voluntary nature of participation and that the candidates can withdraw their participation at any time with no repercussions.

To guarantee privacy and confidentiality in research, it is imperative to employ data management strategies where participants are deidentified and the data are kept confidential and are stored in secured folders protected with strong passwords (Owan & Bassey, 2019). I created a separate folder for each participant that contained all communication and interview transcripts. Interview data and analysis were stored on my password-protected laptop, a personal encrypted USB drive, and password-protected Google Drive. Google Drive will further be protected via 2-step verification via my phone. The informed consent form described the data management practices to advise the candidates. The research data were only shared with my chair and committee member via encrypted and secured data transfer methods. After 5 years, I will destroy all interview-

related files from my laptop, USB drive, and cloud backup using special software to prevent the data from being restored (see Owan & Bassey, 2019).

I continuously reflected on the ethical procedures during the study to identify if I needed to make adjustments (Tracy, 2010). As the researcher of this study, it was my responsibility to monitor and ensure the soundness of the employed ethical procedures during interactions with the participants, sharing the data with my chair and committee member, and the final release. The study was outside my personal or professional context and, thus, did not create a conflict of interest.

### **Summary**

The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. The instrument for this study was the semistructured interview with open-ended questions. This approach allowed for an open conversation that enabled participants to express their views on the research topic. Archival data in practitioner-based design thinking reports and other relevant articles from trustworthy publications were collected to validate the findings and strengthen the study's trustworthiness.

Chapter 4 will contain the results of the data analysis to answer the central research question. The procedures for collecting and analyzing the data from the seven semistructured interviews are described in detail, and, as part of the procedures, the

interview protocol is defined. Any unexpected organizational, procedural, or situational conditions that might have been experienced during the data collection will be identified and described. Chapter 4 will include the conditional proof of trustworthiness (credibility, transferability, dependability, and confirmability).

## Chapter 4: Results

The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. From the data collected to answer the research question, I gained a deeper understanding of theoretical insights and practitioner-based knowledge of how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy, which was previously unreported in the scholarly literature. The research question that guided the development of this empirical study was as follows: How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?

Today, the SME manufacturing sector's sustainability and competitive market advantage are challenged by their larger-sized competitors' rapid adoption of innovative business models (Fischer et al., 2020; Khurana et al., 2021). Exercising design capabilities requires business owners to adopt deep and comprehensive design capabilities across their departments, and practice-based research on this topic is rare (Bjoerklund et al., 2020; Ferrara & Lecce, 2020). Seminal scholars in the design thinking area recommended that research is now needed from strategy-as-practice scholars to fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020). Without a practical

roadmap of how to “sell” design processes horizontally, SME leaders may sabotage the cross-functional collaboration needed to adopt design thinking processes effectively (Ferrara & Lecce, 2020). This study’s results may be significant in developing a practical roadmap of how to “sell” design processes horizontally to drive cross-team collaboration in design-driven SMEs (see Bjoerklund et al., 2020; Ferrara & Lecce, 2020).

This study was framed by two concepts developed by Bjoerklund et al. (2020) within their integrating design across the organization model: a) the concept of co-evolving design capabilities and b) the concept of the design-driven organization. Bjoerklund et al. (2020) found scant scholarly work on the integration of design in an organization and thus framed their work by several practitioner frameworks that depict differences in the extent that design is integrated into organizations. This study is significant to theory by contributing original qualitative data to Bjoerklund et al.’s integrating design across the organization model on developing coevolving design capabilities within project teams to further cross-team collaboration in the design-driven organization.

This chapter analyzes these multiple case study results 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 semistructured interview protocol (Appendix B), whose items were designed and standardized by previous researchers; (b) archival data in the form of practitioner reports and popular media; and (c) journaling/reflective field notes (Merriam & Tisdell,

2015), which I maintained throughout the data collection process. For triangulation purposes, I used multiple sources of evidence. Using thematic analysis, the different approaches ensure the rigor of research design and results' trustworthiness by comparing different codes, such as theory-driven codes obtained from the researcher's codes or other existing theories and inductive codes and applies a bottom-up strategy of reviewing data as prior research-driven code (see Boyatzis, 1998).

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. The multiple case 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). For a multiple case 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., four to 10 cases).

The unit of analysis in this study was the design thinking expert. Each unit of analysis becomes a case study by itself (Eisenhardt & Graebner, 2007; Yin, 2017). The reliability of multiple data collection methods ensures rigor and credible results for replication studies in the future (Yin, 2017). Throughout this chapter, in my reporting of the study's results, I describe the discovered patterns and recurrent themes, maintain the voices and perspectives of the participants; categories of codes, themes, and a cross-case synthesis of themes are also presented below.

### **Research Setting**

I collected data via semistructured interviews with seven academics/practitioners for this multiple case study. The inclusion criteria for participation in the study were (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and 2021 when undergoing a word search under the terms design thinking, SME, innovation strategy, business sustainability, and competitive advantage; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam & Tisdell, 2015). The participants were recruited using network and criterion sampling through the LinkedIn professional social media platform and from the literature review's primary references. After recruitment, I initiated the first contact via email with each participant and attached the informed consent form with the email. After participants responded "I consent" to my email, I asked the participant for a day and time for the interview at the candidate's convenience and within the research study process timeline. The agreed interview date ensured that the participant would find a time at their convenience when no interruptions would distract from the conversation without delaying the data collection process. Each candidate received an invitation for a Zoom meeting via email to confirm the date and time.

The semistructured interview protocol (Appendix B) was created as a guideline to ensure that the interviewee was comfortable with the topic, understood the background of the research, and had some critical definitions in the context of the study area. The

interview protocol was shared upfront allowing the candidates to prepare for the questions and topic at hand. As a result, the participants provided in-depth responses about the subject matter, and rich data were collected.

Using the LinkedIn platform and the literature review's primary references, I was able to identify eight experts for the data collection. Seven of the identified candidates agreed to participate—a sample size within the desired recruitment range. One participant answered the interview questions in writing due to scheduling conflicts; the other six candidates were interviewed via virtual meetings. Each interview took place using the Zoom meeting platform and was recorded within the application and via the Otter.ai app on my iPhone. Additionally, one candidate prepared for the interview by writing the answers for each question into an MS Word file, which he shared with me after completing the interview. This document was used to verify his responses in the transcribed interview recording.

### **Demographics**

Seven academics/experts met the eligibility criteria in the study: four men and three women. All candidates had terminal degrees from accredited institutions and had published several peer-reviewed articles and books. One participant had less than five publications as per inclusion criteria—however, his expertise and in-depth knowledge about design thinking and SMEs made him a valuable expert for the study. The collected demographic characteristics were relevant data points to this study's conceptual framework. The characteristics included gender, age, nationality, years of experience as a

scholar, years of experience as a practitioner, and the number of peer-reviewed publications in scientific journals and indexed on Google Scholar between 2011 and 2022. The given pseudonyms are in an XY format so that X is presented by the generic letter P symbolizing “participant,” and Y is the numerical identifier assigned to each participant.

The study sample demographics consisted of male (4/7) and female (3/7), ranging between the age of 29 and 65 (average = 47.3). Three of the participants were citizens of the United States, one of the United Kingdom, one of Germany, one of Switzerland, and one of Finland. The candidates’ academic experiences varied between 4 and 30 years (average = 15.6), their professional experience was between 5 and 31 years (average = 19.0). The participants published between 2 and 57 peer-reviewed articles indexed on Google Scholar between 2021 and 2022 (average = 31.7). The main subject areas of this research included business sustainability, competitive advantage, cross-functional collaboration, design integration, design thinking, innovation strategy, and organizational change.

### **Data Collection**

IRB approval was granted on December 1<sup>st</sup>, 2021; the data collection started on December 2<sup>nd</sup>, 2021. A total of eight candidates were identified as experts, of which seven consented to the interview. Six of the seven participants joined the interview process via audio-only Zoom, of which one provided written responses in addition to the interview data. The seventh participant chose to provide written answers and not be

interviewed due to scheduling conflicts. The interviews took place between December 14<sup>th</sup>, 2021, and January 7<sup>th</sup>, 2022, and lasted between 24 and 71 minutes (average = 46.3). The data collection was concluded on January 7<sup>th</sup>, 2021. The seven participants expressed themes such as leadership support, external designer, transparency, the definition of goals, and experimentation before no new themes emerged and, therefore, data saturation was reached. The minimum number of interviews required for a qualitative multiple case study should be five participants, and I continued past this number until I reached data saturation, which was seven participants, with similar data noted from Participants 5, 6, and 7 (see Halkias & Neubert, 2020; Schram, 2006). Data saturation became evident during the data collection process when the emerging themes that contributed to answering the research question started repeating, and no new themes surfaced. Triangulation between the various data sources further confirmed the commonality between the themes. The Study Results section provides more information on the data saturation process.

After receiving Walden University's IRB approval, the following steps took place: (a) initial recruitment email to identified experts, (b) scheduling and conducting interviews via the Zoom platform, (c) creation of reflective field notes, (d) review of seminal publications, and (e) transcription of the interview recordings and member checking. Every step of this data collection process was documented in a Microsoft Excel spreadsheet, which served as an audit trail for each participant. This method allowed me to track the progress with each candidate on the completed and remaining action items

(e.g., initial contact, consent received, interview scheduled and completed, transcript completed, member check sent and received). In combination with the reflective field notes, this audit trail helped me conduct the data collection process consistently and thoroughly, establishing rigor for the research.

The data collection took place over 4 weeks, from December 14th, 2021, to January 7th, 2022. Six experts were interviewed using audio Zoom virtual meetings. Additionally, one participant provided written answers in addition to the conducted interview. The seventh participant answered the interview questions in writing due to scheduling conflicts. I planned and scheduled the interview once I received each participant's acknowledgment and agreement to the provided consent form. The interview date and time were mutually agreed upon to ensure that the participant had the time to answer the interview questions without interruptions while remaining within the research study process timeline. Each interview was attended only by the participant and me. The semistructured interview protocol safeguarded the participants' comfort throughout the process and served as a guideline for the interviewees to provide in-depth responses about the subject matter without worrying about confidentiality and anonymity issues.

Immediately after receiving Walden University's IRB approval on December 1st, 2021, I began reflective journaling to ensure the transparency of this research study. I recorded my perspective, assumptions, beliefs, emotions, experiences, comments, and a chronology of all the steps during the research. I continued reflexive journaling

throughout the study. The reflexive journal includes informal conversations with the participants, comments I took during the interviews, notes during the recruitment, and feedback from the member check process. The study's subject matter was of mutual interest for all interviewees and myself. It served as common ground and helped to quickly establish a valuable rapport and a bond of trust between the participants and the researcher. This experience helped me get a deeper understanding of the data collection process as a researcher. I gained valuable knowledge from design thinking experts making this data collection a rich experience.

Some of the challenges included identifying qualified experts and finding a mutually suitable date and time for the interviews during the data collection process. Initially, I could not identify enough candidates via LinkedIn and extended my recruiting process to the literature review's primary references to reach data saturation. Some of the identified experts did not immediately respond to the initial email contact and I had to follow up with them. In some cases, the participants' busy schedule and the dispersion across several time zones required multiple emails to find a mutually agreeable interview date, and in two cases caused at least once a rescheduling of the interview. One participant offered written responses to the interview questions after multiple attempts to schedule the interview failed. All interviews were conducted without issues using the audio Zoom platform. The different time zones were respected; data confidentiality and the participant's anonymity were reassured. The audio was recorded and later used for the transcription of the interview.

The interview protocol was used in each interview to ensure consistency across the cases. With seven questions, I asked the design thinking experts to describe their views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. Two questions asked for the participants' opinions about general challenges and recommendations surrounding the implementation of design thinking in SMEs. Three questions aimed directly at implementing design thinking into the design thinking strategy of a business. Two questions asked how design thinking would affect SMEs' competitive advantage and business sustainability. The definitions of terms were provided to the participants to ensure a common understanding of these terms and consistent responses. The experts shared a common understanding of the terms business sustainability, competitive advantage, cross-functional team, design thinking, manufacturing industry, and SMEs.

### **Initial Contact**

Using network sampling through the LinkedIn platform, I contacted the identified experts first on December 2nd, 2021. The inclusion criteria for participation in the study were (a) authored at least five peer-reviewed papers published in scientific journals and indexed on Google Scholar between 2011 and 2021 when undergoing a word search under the terms design thinking, SME, innovation strategy, business sustainability, and competitive advantage; (b) have a terminal degree from an accredited institution; and (c) possess in-depth expert knowledge regarding the central topic of study (see Merriam &

Tisdell, 2015). Several candidates were identified based on these criteria, their academic research, and peer-reviewed publications. Additional experts were identified from the primary references in this research study.

Participants acknowledged and agreed to the consent form between December 2<sup>nd</sup>, 2021, and December 20<sup>th</sup>, 2021. The last outreach for participants ended after the last interview on January 7<sup>th</sup>, 2022. As described in the recruitment procedures in Chapter 3, design thinking experts were identified based on their fulfillment of the sample inclusion criteria through Google Scholar. I sent the recruitment letter, including the consent form, through the LinkedIn platform in sequential order after the potential experts were identified. Most participants immediately acknowledged and agreed to the consent form and its term via email. Some responded with interest but had to be asked for the formal “I consent” reply. Only a few candidates had to be followed up with to respond. The interview dates were timely agreed-upon and scheduled, except for one participant who responded in writing to the interview questions. All candidates that met the inclusion criteria positively responded to the study’s topic of interest. Seven experts emerged from network sampling and agreed to participate and the consent form and its terms.

### **Interviews**

Candidates responded within a few days of my recruitment letter whether they were interested in participating in my research study. Once participants responded “I consent” to the consent form, I asked for their availability for an audio Zoom interview at their convenience in their local time zone. All candidates agreed to an interview date and

time within a few days. The virtual Zoom meeting platform was used for all interviews due to the geographical dispersion of the candidates and the ongoing COVID-19 pandemic, and its restrictions on in-person meetings. After multiple attempts to reschedule, one of the participants responded to the interview questions in writing due to scheduling conflicts.

Of the six Zoom interviews, one was created by a participant. All other interviewees asked me to provide the meeting invite. I used the Zoom platform to create the meeting invitation, including the dial-in information, which I copied and pasted into an Outlook meeting invite. All interviews via Zoom were audio-only and recorded via Zoom's integrated recording feature, the Otter.ai app on my iPhone, and a digital voice recorder. I experienced no issues connecting with the experts via the Zoom platform or with any of the employed recording tools. The Otter.ai app automatically provided an initial transcript that was later cleaned up and corrected as needed. All interviews were successfully completed and yielded rich, in-depth data from the design thinking experts.

All six interviewees agreed to the audio recording of the virtual interviews. One participant prepared his responses to the interview questions in writing and shared those notes with me after the interview. I tested the Zoom platform thoroughly before conducting the expert interviews to ensure the connection and recording would function smoothly. Aware of the importance of the interviews and the rare opportunity to meet the selected experts, I used a digital voice recorder and my iPhone as backup voice recorders to Zoom. Using a virtual meeting platform such as Zoom proved indispensable

considering that the candidates' locations spanned across the time zones from Dubai (UTC+4) to the West Coast of the United States (UTC-8). Each interview was conducted using the interview protocol (Appendix B) as a guideline. Using Zoom as a virtual platform allowed me to recruit and interview design thinking experts regardless of their physical location and expanded the reach of this research study (see Yin, 2017).

### **Journaling/Reflective Field Notes**

I received Walden University's IRB approval on December 1<sup>st</sup>, 2021, and immediately began journaling and recording my reflective field notes. I reviewed daily the audit trail for upcoming tasks and documented changes and updates. I added action items with due dates/times to my calendar with timely reminders. Microsoft Excel served as a platform for the audit trail and listed all activities (past and upcoming) for each participant. My committee chair received updates of my progress with each significant step or at least once a week. I also maintained a handwritten journal to complement the audit trail and balance the information across the documents. The combination of journaling and reflective notes increased the study's information and strengthened the study's validity.

To minimize my researcher's bias and manage possible expectations, I continuously documented my thoughts in a journal and took the time to reflect on them. Active and mindful listening allowed me to remain objective during the interviews and yield rich, in-depth participant data. Pauses, tone of voice, speed, pronunciations, and the expression of vocal and word patterns enriched the interviewees' responses and

accentuated specific points of interest during the conversation. The participants communicated their responses to the interview questions beyond the pure words, added a deeper meaning, and enriched the data collection. I remained culture conscious and treated each candidates' various backgrounds, feelings, and emotions with respect and without judgment or preconceived assumptions. After completing each interview, I provided the transcript to each participant, allowing them to reflect upon their responses, clarify answers, and correct where necessary (see Jacob & Furgerson, 2012).

Active listening and note taking were used to capture the data during the interviews. After completing each interview, Otter.ai transcribed the recording while I documented my thoughts and feelings concerning the interview in my journal. Following immediately after, I listened to the voice recording and focused on the interviewees' use of pauses, tone of voice, speed, pronunciations, and the expression of vocal and word patterns. The participants' inflections complemented their verbal responses and allowed me to identify common patterns and themes. I listened to each recording several times to ensure that I captured the truthful meaning of the conversation.

Using a systematic, manual coding technique of the collected data, I identified themes that emerged from analyzing the meanings and the delivery of the social reality constructed by the participants (see Vaismoradi et al., 2016). Patterns and themes emerging within a multiple case study design allow the researcher to explore the data within and across the cases (Yin, 2017). The emerging themes gain significance and develop their whole meaning by carefully selecting studied cases to predict similar results

(literal replication) and contrasting results (theoretical replication; Yin, 2017). The data's dependability and trustworthiness were further strengthened by triangulating the multiple data sources.

In addition to the inclusion criteria, the participants were selected based on their willingness to share their opinions openly with in-depth and rich responses to the interview questions. All participants' professional backgrounds included experience in design thinking and innovation strategies. Also, all participants had conducted extensive academic research and publication in the field of interest during their academic careers. Moreover, most participants directly understood as consultants implementing design thinking into an organizational business strategy. Before the interviews, I provided the definitions of business sustainability, competitive advantage, cross-functional team, design thinking, manufacturing industry, and SMEs related to this research to achieve a shared understanding between the experts and me.

### **Transcript Review**

After an interview was completed, I sent each participant the recorded transcription to their email address. I asked that the transcript be reviewed for correctness and completeness and edited if necessary. Asking participants to verify their responses through transcript review ensures that the interviewee's voice is heard and is appropriately reflected to increase the data's credibility (Hagens et al., 2009). Most participants verified the accuracy of the transcript without additions or changes, and only one participant provided additional clarifications. The transcript review process was

communicated through emails between participants and me and logged in the audit trail. Once the participants completed the transcript review process, concerns about data accuracy were reduced, and the data's creditability strengthened (Merriam & Tisdell, 2015).

The interview questions were provided before the interview allowing the candidates to prepare for the research interview. The participants also had the interview protocol as a reference for accurate responses during the interview. The questions were arranged to yield a comprehensive review of the subject matter from the perspectives of the experts. Due to the semistructured nature of the interview, some questions allowed participants to respond in a way that touched on succeeding questions. The resulting redundancy of the responses did not affect the interview data as the interview protocol ensured that all questions were answered consistently and in-depth but extended the interview length. The transcript review process allowed the participants to check, verify, and, if necessary, edit their responses to strengthen the data's validity and to comply with ethical standards. All transcripts were sent via email to each candidate after the interview. The participants reviewed the transcripts to clarify responses, avoid misconceptions, or prevent misinterpretation of the collected data (Mero-Jaffe, 2011).

The participants had a copy of the definitions of business sustainability, competitive advantage, cross-functional team, design thinking, manufacturing industry, and SMEs to create a shared understanding and guide them during the transcript review. The transcript review process served as an additional tool to validate data accuracy and

completeness. Most participants completed the process within a few days with no corrections or additional comments. Only one participant edited the transcript to increase the clarity of the given answers. The final transcripts were saved in password-protected files and folders per the ethical procedures outlined in Chapter 3 before coding the data.

### **Data Analysis**

The descriptive coding strategy was used for analyzing the raw data collected to assign meaning to the data segment (Saldaña, 2016; Vaismoradi et al., 2016). Using the descriptive coding strategy allowed for the emergence of words and phrases for further categorization and thematic analysis. The in-depth views of seven participants on the phenomena under study were captured from their interviews' raw data (transcripts). 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 design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

A data transcription was developed, analyzed, coded, and categorized using the Microsoft Excel Spreadsheet (Yin, 2017). In developing a case study database, identified themes, words of significance, viewpoints, and documented work were analyzed and

organized using thematic analysis to develop the models and themes from the data (Yin, 2017). By aligning the data collection and analysis, the process offered concurrent emergence of critical concepts aligned with and addressing the research problem (Stake, 2013). The method involved manual coding, categorization, and recognizing emergent patterns and themes across the cases.

I followed Yin's (2017) recommendation for a "ground-up" strategy to analyze case study data. This strategy involved analyzing the data from the "ground up," allowing key concepts to emerge by closely examining data. This strategy was the most appropriate for analyzing multiple case study data, utilizing the emerging concepts to answer the research question (Yin, 2017). This strategy was also consistent with the descriptive coding method (Saldaña, 2016) that is the analytical technique used in the study. The thematic analysis approach was used for the descriptive coding method to code the data systematically. The systematic process for mapping the structure of common themes allowed the researcher to shift from collecting to analyzing the data. I discovered data segments from the participants' transcripts that described experiences and categorized sets of keywords (Saldaña, 2016).

Yin (2017) recommended cross-case synthesis as the most appropriate data analysis technique in multiple case study research. Cross-case synthesis is more efficient than content analysis for a Ph.D. study that also involves comparing and contrasting cases rather than just analyzing individual cases. The cross-case synthesis technique involves treating each case separately while aggregating findings across a series of individual

cases. Designs that use both within-case and cross-case synthesis have proven to provide more reliable qualitative study results to generate theoretical propositions than designs that use only the within-case analysis (Halkias & Neubert, 2020).

After the data had been coded from the interview questions, the objective was to link themes to classifications grounded in the conceptual framework and scholarly literature reviewed in Chapter 2. The codes identified common themes arising from the responses provided by the participants while collecting research and other field notes taken by the researcher (Merriam & Tisdell, 2015). Each case provided evidence to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. I used cross-case synthesis as the data analysis technique of this multiple case study to determine whether the case studies are comparable by analyzing the collected data's convergence and divergence (Yin, 2017).

The thematic analysis for this study was done by hand-coding the data through a systemic process following the descriptive coding method (Saldaña, 2016). The descriptive coding method was used to assign meanings to segments of data collected from the interviews and the description of design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. This process provided an inventory of words or phrases for indexing and categorizing the data (Saldaña, 2016). Once the transcript review checking was finalized, I hand-coded the

interview notes using an Excel spreadsheet to enter the participants' transcribed responses to the questions. The triangulation of data and word coding also allowed for broader recognition of patterns and increased dependability by drawing attention to common relationships across multiple cases. I identified coding categories and emerging themes that answered the research question (see Yin, 2017).

I identified a total of six coding categories that enclosed a total of 28 themes during the process of analyzing the study's collected data. The coding categories were (a) leadership competencies for implementing a design strategy in SMEs, (b) leading a cross-functional team to adopt design thinking, (c) sustaining design thinking within a cross-functional team, (d) developing a design thinking business model for sustainability, (e) gaining competitive advantage with a design thinking business model, (f) embedding design thinking in a manufacturing SME to drive competitive advantage.

The six coding categories were grounded in the conceptual framework, which included two concepts developed by Bjoerklund et al. (2020) within their integrating design across the organization model: a) the concept of co-evolving design capabilities and b) the concept of the design-driven organization.

Using the manual descriptive coding method, I immersed myself in the data (Cronin, 2014). This method had the advantage that it allowed me to engage with the data deeply and helped me develop a thorough understanding of the collected data and the research problem (Fingeld-Connett, 2014). Following Saldaña's (2016) recommendation

for novice researchers, I opted for the manual coding method rather than using Computer Assisted Qualitative Data Analysis (CAQDAS) programs to analyze the collected data.

To guide me to a comprehensive data analysis, I included the semistructured interview protocol, the items of which were designed and standardized by previous researchers, archival data in the form of business reports, industry reports, and media articles on design thinking, and my reflective field notes (Merriam & Tisdell, 2015; Yin, 2017). Throughout the data analysis process, I used my reflective field notes to contemplate participants' responses during the within-case and cross-case data analysis. I supported my interpretations with archival data to manage my researcher's bias and remain aligned with the research problem and purpose. In an iterative verification cycle between the collected data and emerging themes and categories, I immersed myself in the data to deepen my understanding and thoroughly analyze the responses to the interview questions.

I used multiple data sources (interview transcripts, journaling, and archival data) to understand design thinking experts' views. As I iteratively verified collected data, themes, patterns, and categories, I continuously strove for objective interpretations to align with the research problem and purpose. The iterative process allowed me to identify repeating themes and categories, indicating that further coding would not reveal new information (Fusch & Ness, 2015)

I used a hierarchal coding frame to organize codes and themes based on how they relate to one another, as is presented below. Six coding categories based on the

conceptual framework emerged from three root nodes, and 28 themes were gleaned from the thematic analysis of the coding categories as viewed below.

### **Coding Categories**

**Root node:** *Manufacturing SME leader drives design thinking as an innovation strategy*

**Coding category:** Leadership competencies for implementing a design strategy in manufacturing SMEs

**Themes:** 1) leadership skills for business model innovation, 2) well-skilled in the design thinking process, 3) outstanding communicator, 4) be a role model for managing change, 5) be a customer-centric leader, 6) strong conflict resolution skills

**Coding category:** Leading a cross-functional team to adopt design thinking

**Themes:** 1) be an organizational culture influencer, 2) be a champion of design thinking, 3) be a role model for managing change and uncertainty, 4) transparency with communication and breaking down silos, 5) seek support from external consultant/facilitator

**Coding category:** Sustaining design thinking within a cross-functional team

**Themes:** 1) treat all employees as important stakeholders in the firm's future, 2) coach employees to champion design thinking, 3) support successful designer experiences for the non-designers, 4) effectively manage resource allocation and constraints, 5) continuous formal and informal information sharing

**Root node:** *Manufacturing SME leader drives design thinking to support business sustainability*

**Coding category:** Developing a business model for sustainability within a manufacturing SME

**Themes:** 1) provide adequate resources, 2) adapt to market circumstances, 3) ability to sustain value creation with an innovative business model, 4) immediate and strong responsiveness as markets evolve

**Root node:** *Manufacturing SME leader drives design thinking to support competitive advantage*

**Coding category:** Embedding design thinking in a manufacturing SME to drive competitive advantage

**Themes:** 1) invest in a deep understanding of the customer, 2) build a service ecosystem around products to create an experience, 3) rapidly adapt production cycles to the market, 4) equal intrinsic value to the product and the customer needs

**Coding category:** Gaining long-term competitive advantage with a design thinking model

**Themes:** 1) consistent attention to performance metrics and their diverse meaning across departments, 2) create an innovation mindset across the company, 3) diffuse communication into all layers of the organization, 4) continuous research, professional development, and experimentation

According to Boyatzis (1998), case studies' findings could be displayed in different forms, depending on the data type, the purpose of the study, and its audience. In this study, the themes and categories are presented in the form of a table displayed for a visual representation of design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Harding, 2018).

As shown in the Coding Category section of this chapter, each theme belongs to its corresponding category. Differences occurred among the themes with the frequency of incidences, which present certain cases as more notable than others from the data analysis. This chapter provides further discussion 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 4 below presents the finalized coding categories and themes of this multiple case study, along with representative participant quotations aligning with each of those categories and themes.

**Table 4***Coding and Theme Examples*

<b>Participant</b>	<b>Interview excerpt</b>	<b>Category</b>	<b>Theme</b>
Participant 1	“But when that solution starts to get co-created, in that social setting, that's when you really need the commitment of management of the company and ownership of the company to follow through.”	<i>Leadership competencies for implementing a design strategy in manufacturing SMEs</i>	1) leadership skills for business model innovation 2) well-skilled in the design thinking process 3) outstanding communicator 4) be a role model for managing change 5) be a customer-centric leader, 6) strong conflict resolution skills
Participant 7	“Don't try and force change on people - It's gonna backfire. That's, that's a given. And you've got that backing from the leadership "that this is the way we're going to start moving forward".”		
Participant 6	“I think creating a “culture of design thinking” might be a good start. Making the ideas of experimentation and rapid prototyping seem acceptable – through top-down role-modeling from leaders - is essential to getting people to buy in to a design thinking approach.	<i>Leading a cross-functional team to adopt design thinking</i>	1) be an organizational culture influencer 2) be a champion of design thinking 3) be a role model for managing change and uncertainty 4) transparency with communication and breaking down silos 5) seek support from external consultant/facilitator
Participant 7	“And one other thing that I just thought about when you're starting to initiate this in a small to midsize company and it's changing		

Participant	Interview excerpt	Category	Theme
	the culture. A good opportunity for the business leader is to be willing to talk about this in a town hall with the employees. Today's world that might be over Zoom or it might be in you know, physically in a room somewhere in a manufacturing plant, but having the have given the opportunity for folks to ask questions.”		
Participant 2	So, what you should do is in the end of the design thinking process, once you come up with your prototype is think of okay, we do have internal stakeholders that need to understand where we're coming from.	<i>Sustaining design thinking within a cross-functional team</i>	<ol style="list-style-type: none"> <li>1) treat all employees as important stakeholders in the firm's future,</li> <li>2) coach employees to champion design thinking</li> <li>3) support successful designer experiences for the non-designers</li> <li>4) effectively manage resource allocation and constraints</li> <li>5) continuous formal and informal information sharing</li> </ol>
Participant 5	“So design thinking can help in that kind of identifying what that right issue would be exploring the kind of stakeholder ecosystem value creation ecosystem and kind of see what those opportunities would be, as well as then help in the actual experimentation development in those, so, doing small kicks scales, but pilots to kind of decrease the risk and learn		

Participant	Interview excerpt	Category	Theme
	from those and engaging other partners onboard into these prototypes or things of small scale experiments to build that demand. So, kind of allowing the effective allocation of resources in a way that is viable and a longer-term rather than just kind of works for short term by identifying those underlying needs.”		
Participant 4	<p>“So, so to me, this focus on customers helps long term sustainability because it helps me connect to the social and emotional needs, not just the functionalities...And so, so long term growth to me means that I'm able to expand my offering. Minimally in one of those two dimensions, another dimension would be to say, these are the jobs I help customers do, who else needs to get those jobs done? So, the more I can look at the world, through the lens of the customer, and the jobs to be done, the more I can discover adjacent opportunities to what it is that I'm offering now. And to me, that's what long term sustainable growth is about.”</p>	<p><i>Developing a business model for sustainability within a manufacturing SME</i></p>	<p>1) provide adequate resources 2) adapt to market circumstances 3) ability to sustain value creation with an innovative business model 4) immediate and strong responsiveness as markets evolve</p>
Participant 3	<p>“So, design thinking is an instrument to gauge understanding of the market</p>	<p><i>Embedding design thinking in a</i></p>	<p>1) invest in a deep understanding of the customer</p>

Participant	Interview excerpt	Category	Theme
	and is not necessarily a definite or final instrument. But it is a form of prototyping and feedback that you can integrate back into some form of operational effectiveness, redesigning production cycles. So implemented design thinking at any level of the SMEs makes you gain competitive advantage when you are getting a quick validation from the market and rapidly adapting your production cycles.”	<i>manufacturing SME to drive competitive advantage</i>	2) build a service ecosystem around products to create an experience 3) rapidly adapt production cycles to the market 4) equal intrinsic value to the product and the customer needs
Participant 3	So, to me, communication, of course needs to cascade down to a point which is becoming first of all distributed and diffused. And the diffusion - if you diffuse, more by scaling the information out - tends to decrease the natural tension you have in information dissonance. So, I would say the diffusion of information is critical. That can happen through technology solution as much as town halls, meeting stakeholders - you have multiple forms of engaging organization at large. But the core idea is not just to share the information but to make sure that you're looking after the diffusion.	<i>Gaining long-term competitive advantage with a design thinking model</i>	1) consistent attention to performance metrics and their diverse meaning across departments 2) create an innovation mindset across the company 3) diffuse communication into all layers of the organization 4) continuous research, professional development, and experimentation

## Evidence of Trustworthiness

### Credibility

To strengthen the study's credibility, researchers employ strategies including prolonged engagement, persistent observation, triangulation, peer debriefing, member checking, negative case analysis, reflexive journaling, and referential adequacy (Lincoln & Guba, 1985). A preliminary field test was conducted to determine whether the study's interview question items would produce results to answer the central research question (see Tracy, 2019). Once candidates acknowledged and accepted the consent form and its terms, the interview was scheduled at a date and time of their convenience to ensure that they would be comfortable and uninterrupted. The shared interest in the research topic quickly established a rapport between the experts and me and enabled prolonged, friendly interaction from the first point of contact to the last outreach.

During the interviews, I encouraged the candidates to elaborate on topics they felt comfortable with and clarified each answer to ensure a proper understanding. A transcript review process was used that allowed participants to review, correct, add, or clarify their given responses to increase the collected data's validity (Birt et al., 2016; Mak-van der Vossen et al., 2019). The candidates' approval of their final transcripts marks the data's credibility (Toma, 2011). I continued to interview experts beyond the minimum number of five participants in qualitative multiple case studies until I reached data saturation, which was seven participants, with similar data noted from participants 5, 6, and 7 (see Halkias & Neubert, 2020; Schram, 2006). I maintained an audit trail and reflexive

journaling from the date I received Walden University's IRB approval until the final interaction with the participants.

### **Transferability**

Generalizability involving transferability makes sense in qualitative, theory-building research and depends on the researcher's understanding on knowledge of the context (Carminati, 2018; Yin, 2017). Researchers must manage their bias and ensure that the participant's voice is heard unaltered by the researcher (Birt et al., 2016; Paraskevas & Saunders, 2012). Continuous reflexive journaling helped me to reflect upon my bias and my position. I further managed my bias by practicing active listening and mindful notetaking. I created a rapport with the candidates and maintained a prolonged engagement to yield rich data during the research.

Purposeful sampling allowed me to recruit participants to produce data that would answer the research question best (see Paraskevas & Saunders, 2012). The careful selection of the participants allowed me to reach data saturation with a small sample group of experts. The group's expertise yielded thick descriptions and rich data, and the variation of personal biases remained controlled without diminishing the accuracy and generalizability of the study's findings (see Hasson & Keeney, 2011; Morse, 2015).

During the interviews, I used follow-up questions and encouraged participants to elaborate to extract rich data from the experts. I created thick descriptions of the collected data and data analysis to increase the transferability of the study to another context (see Carminati, 2018). The transcript review process allowed the interviewees to verify the

collected data. I preserved the data's interpretation and research findings by maintaining a detailed audit trail with all events related to each candidate and additional reflexive journaling (see Houghton et al., 2013).

### **Dependability**

Dependability describes how consistent the study's results are with the collected data and ensures a possible replication of the findings using various strategies (Merriam & Tisdell, 2015). To describe the consistency within the research, I employed a detailed audit trail to describe every step with each participant from the first contact to the final outreach and document every decision made and every action taken. I linked the findings to the collected data and the research question by maintaining this chain of evidence. This detailed audit trail improved the credibility, transferability, dependability, and confirmability of the study (see Amankwaa, 2016). My audit trail included the raw data, a documented process of data reduction, analysis, synthesis, and reflexive journaling to strengthen the study's dependability (see Lincoln & Guba, 1985). Triangulation and a stepwise replication of the data analysis further improved the dependability.

### **Confirmability**

Audit trails, reflexive journaling, and triangulation contribute to the study's confirmability (Berger, 2015; Hasson & Keeney, 2011; Morse, 2015). Throughout the study, I maintained a detailed audit trail describing every step for each participant. Every decision made and every action taken were documented in this audit trail. Reflexive journaling allowed me to reflect upon my beliefs, assumptions, emotional experiences,

and bias and enabled me to prepare objective interview questions (see Morse, 2015). I continuously managed my bias by preserving the raw transcripts of the expert's responses (see Berger, 2015). I used a transcript review process allowing each participant to review and approve their transcript to further reduce my bias during the data collection and analysis. Employing triangulation between the various sources validated the findings and consistency of the study and strengthened the confirmability.

### **Study Results**

This qualitative multiple case study is framed by two concepts within Bjoerklund et al.'s (2020) integrating design across the organization model: a) the concept of co-evolving design capabilities and b) the concept of the design-driven organization. The study's conceptual framework aligns with its purpose to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. A sample size of seven subject matter experts participated in the interview process and shared their views on the strategies needed by manufacturing SME leaders aiming to transition their firms to a design-centric organization. The overarching research question that directed this study was: How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage? As Saldaña (2016) recommended, a multiple-case study design served to collect data segments that helped build a list of phrases and words to categorize and index.

The manual coding method was used to formulate the themes that emerged from the thematic data analysis and the cross-case synthesis analysis, which enabled me to explore the cross between the convergent and divergent data across the seven cases. Each unit of analysis in a multiple case study design becomes a case study in itself when the individual focuses on the research (Eisenhardt & Graebner, 2007; Yin, 2017). In this study, the unit of analysis was the design thinking expert. Systematically looking for similarities and differences of the evolving themes across the cases was iterative throughout the data analysis step. It involved generating journal notes explaining participants' experiences and views regarding the subject matter and the studied phenomenon during the actual interview process (Yin, 2017). The data collected throughout the interview process were relevant and rich, eliminating the issue of non-relevant information.

The cross-case analysis conducted during the data analysis helped establish the similarities among the cases through a convergence and divergence analysis of the data collected (Halkias et al., 2022). Multiple sources collected evidence via numerous data collection methods to implement triangulation, including semistructured interview protocols, reflective field notes, archival data such as industry and business reports, and media articles on implementing design thinking as a business strategy. Audit trails and transcript reviews were also conducted throughout the data collection and the data analysis processes (see Merriam & Tisdell, 2015; Yin, 2017).

Yin (2017) recommended consistency when collecting and analyzing data in a multiple case study design, a harmonized platform for cross-case comparisons, and thematic analysis. The cross-case analysis was conducted by categorizing the emerging themes during the data analysis process in a tabular format, which allowed a cross-reference of the results to represent the participants' direct quotes visually. The data synthesis method combined answers across various individual cases and reinforced the study's results while treating each case separately (see Halkias & Neubert, 2020). The two phases of this study's data analysis were completed as described in detail below: a within-case analysis of each of the selected cases and 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**

Because a synchronized data collection and data analysis could impact the strength of study results, Nowell et al. (2017) recommended conducting the data analysis in a sequence of steps for the trustworthiness process. A step-by-step process allows for a logical and objective obtention of study results, reflecting both the data collection and analysis processes and delivering credibility and dependability. This study's thematic analysis approach included present representative verbatim quotes for an in-depth understanding of the participants' explanations that allowed them to maintain their voice in the study results presentation.

The following paragraphs present the themes from the interview data collected and analyzed.

### ***Leadership Skills for Business Model Innovation***

This theme describes the central role of SME leaders in providing an environment supportive of design thinking and committing to integrate design thinking into the business strategy to embed, grow, and reinforce an innovative organizational culture. SME leaders need to drive buy-in of design thinking integration and “sell” the design thinking across department borders (Bjoerklund et al., 2020; Ferrara & Lecce, 2020; Wrigley et al., 2020). Participants described the challenge of leadership commitment, proficiency, and follow-through to inspire business model innovation.

#### Participant 1:

And so, really, the resources I really need from them (SME leaders) are a commitment. A commitment of the people and then a commitment to follow the outcome. Because remember, I'm not designing the solution. It's a socially designed solution with this group of social peers that have come together. So when you bring those people together and they solve a problem, if the company doesn't follow through with that they run the risk of disengaged, right? It really can become a de-motivator and de-engage people from the company if they're not committed to following through with what the team thinks is a solution.

Commitment is a big deal.

Participant 7: “Don't try and force change on people - It's gonna backfire. That's, that's a given. And you've got that backing from the leadership "that this is the way we're going to start moving forward".”

Participant 5:

So, if you don't have the management team or owner on board with that, then they think it's difficult to do the exploration that would enable you to get to that good design result. So, it would be the key thing to have them on board.

***Well-Skilled in the Design Thinking Process***

This theme describes an optimum skill level acquired within an SME organization to optimize design thinking, a nonlinear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. Design thinking is not intuitive and requires organizations to develop expertise and experiences (Sciotto, 2020). Through training, SME leaders can develop organization design thinking skills and use KPIs to measure progress (Wrigley et al., 2020). Only when employees are properly educated on the basic design thinking principles will they understand when or how to collaborate (Bjoerklund et al., 2020). The participants described the challenge associated with the needed design thinking expertise and experience.

Participant 3: “Design thinking doesn't happen, you need to go through some form of training or some form of exposure that is collateral to training your staff, and smaller entities, they tend to be less exposed to trends.”

Participant 6:

I think that you may not have anyone in a SME that understands design. As a result, there may not be anyone who can champion the design thinking approach.

Design training and experience is not the typical background for many start-ups. You are more likely to have people from Engineering, Marketing, and Management. These folks may be wary of design, especially the idea of “failing early and often” – which is a mantra of design thinking.

### ***Outstanding Communicator***

This theme describes an SME leader who effectively manages communication and delivery, such as distributing and diffusing information considering the various subcultures of isolated silos. SME leaders need to effectively communicate and deliver information to improve the desirable collaboration between design thinkers and other groups (Roper et al., 2016). Empathizing with internal users allows SME leaders to improve their communication (Kolko, 2015). The experts identified the challenges of effectively distributing and diffusing information to permeate existing layers of subcultures.

#### Participant 4:

So, one of the things I think designers have to do is, first of all, they have to learn the language of the other people. And then secondly, they have to be patient as they, you know, try to explain what it is that they're looking at. [...] And how do I connect my language to their language in a way that they see the value of what I bring to the team?

Participant 6:

The main issue with design thinking is that folks from traditional functions see it as “fluff” and non-scientific. Designers who can talk to folks from other functions – as knowledgeable in those functions - are more likely to convince them of the merits of design thinking.

Participant 3:

Communication tends to happen top down, but it doesn't necessarily diffuse into the layers of the organization. So that's really more about how you make sure that you're constantly translating the conversation across the different departments, and also making sure that the translation is taking into account the cultural traits that are actually part of the subculture of departments. So, for translating information in the IT department, it might not necessarily be meant the same if the same information is arriving at the operation department or the marketing department.

***Be a Role Model for Managing Change***

This theme describes an SME leader who openly demonstrates the need to innovate to survive a business environment characterized by chaos and unprecedented changes, champions changes in an organization’s culture, and manages resistance. By creating a shared understanding and vision of innovation strategies, SME leaders can create excitement and buy-in from upper and middle management (Sciotto, 2020).

Collaboration between an SME’s leadership, management teams, and employees creates

bottom-up support (Wrigley et al., 2020). The participants discussed the challenge associated with SME management's role to drive design thinking.

Participant 6: "Making the ideas of experimentation and rapid prototyping seem acceptable – through top-down role-modeling from leaders - is essential to getting people to buy in to a design thinking approach."

Participant 7:

A good opportunity for the business leader is to be willing to talk about this in a town hall with the employees. Today's world that might be over Zoom or it might be in you know, physically in a room somewhere in a manufacturing plant, but having the have given the opportunity for folks to ask questions. And you know, the business owner can have some subject matter experts there with them so that they can feel some of those questions but having a report and feedback one-on-one can really help kind the process.

Participant 2: "And looking at what the leader can do specifically [...] So, building projects, legitimize different procedures when compared to the past, by advocating change..."

### ***Be a Customer-Centric Leader***

This theme describes an SME leader who can create meaningful customer experiences and empathize with customers to understand customer needs and desires intimately. Leaders of customer-centric organizations achieve higher revenue and stakeholder return growth than industry benchmarks and outperform the standard S&P

(Design Management Institute, 2019; Sheppard et al., 2018). The participants described the challenges of being a customer-centric leader.

Participant 2:

And looking at what the leader can do specifically [...] So, building projects, legitimize different procedures when compared to the past, by advocating change, by advocating more user-centricity, by also basically a company with challenges giving, like putting out a name under it, not only trying it out and then if it succeeds, but also if it fails, and to advocate a culture of learning and failing to succeed. I think these are things that leaders should consider and can easily do to support design thinking in their own organization.

Participant 4:

So, I would say, you have to start with wanting to be a customer-focused organization. And, and if you don't have that, that's really hard. The literature on customer-focused design makes the same suggestion that you sort of have a baseline of customer-focused leadership. And without that, it makes it really tough for the organization to engage in customer-focused behaviors.

***Strong Conflict Resolution Skills***

This theme describes an SME leader's ability to resolve conflicts between the novel idea of design thinking and traditional organizational traits such as existing power dynamics, existing mindsets, and prevailing hierarchies or, more abstractly, between formalization and creativity and between control and adaptability. Traditional cultures are

believed to conflict with the radical design thinking approach (Carlgren et al., 2016; Elsbach & Stigliani, 2018). Traditional companies focus on “getting better at what they are good at” and resist experimentation and collaboration (Carlgren et al., 2016; Elsbach & Stigliani, 2018). The participants discussed the challenges associated with conflicts arising between the novel idea of design thinking and existing organizational cultures.

Participant 4:

I think those things I would hope that small and medium enterprises don't have as much hierarchy. But it's not always true. Partly if the founders want to retain control. You know, they may not be developing frontline decision-making the way they need to. So those are kind of the things I think about when I think about what could go wrong in an SME. [...] I think the biggest issue just comes down to lacking a shared understanding of the outcomes you're helping the customer achieve. And if you don't have that shared understanding, you can't make appropriate tradeoffs. On the design team, you're going to get into finger-pointing and arguing about what you want to do as opposed to what the customer would like you to do. In a design certainly has a role in helping bring the customer alive well enough that the team can focus around that instead of around their own stuff.

Participant 7:

Typically, the bind is, you know, the engineers are a certain type of people, the IT groups are a certain type of people. HR is another type of people. And you know, while everybody's different, there are certain familiarities that you get - having

worked for different organizations, I can say that - that, what's gonna happen, you know, engineers are very rigid about processes because they're very precise, they're very accurate, and they've been testing over time. So, somebody's coming in, and kind of churning things up is just gonna freak them out. Similarly, with IT, security and things like that are such a huge concern. They've got to have very flexible approaches in some ways, but you know, they can't compromise on certain things in terms of security. So, it's critical that everyone comes to the table and understands where their friction points are. And you can have very, very constructive dialogue with those folks. But they've got to understand where these you're coming from, what ultimately is the objective? And how can they help right, rather than telling them this is what's going to happen or that's going to happen? And I think most of the time when you address things like that with different groups, they get it, and then we're willing to work with you. So yeah, just be aware of what those differences are.

### ***Be an Organizational Culture Influencer***

This theme describes an SME leader's ability to align the corporate vision with the directions to build a collaborative organizational culture and transform existing beliefs into an organizational culture that generates an innovative mindset to help managers implement design thinking tools. Organizational cultures are believed to impact the deployment of design thinking tools (Beverland & Farrelly, 2007; Elsbach & Stigliani, 2018; Kolko, 2015). Considering the organizational influence on the success of

design thinking implementations, SME leaders might need to change prevalent cultures to avoid internal resistance (see O'Hern & Rindfleisch, 2010). The participants discussed the challenges associated with the existing organizational cultures and prevailing mindsets in SMEs.

Participant 1:

Outside of the typical resource constraints, you know, sometimes it's a general, from what I see is, it's a general difference in culture. It's a cultural difference for the team. A lot of times, small and midsize enterprises tend to be more tactically focused and operationally focused, you know?

Participant 1:

So, you know, the best way obviously, most of this, you know, this is a, you know, probably where, where my research has evolved more than anything is really into the cultural shifts that have to happen. To really to adopt a design mindset. And various people struggle with that from a personality standpoint. But, you know, typically it's cultural, it's political in organizations, especially small-medium enterprises.

Participant 5:

So, I think that those kinds of scope negotiations and getting that understanding that even if we have specific goals in mind, we want to explore a larger segment. I think that would be a key support need and getting everyone on the same page

that we want to ask more questions before jumping into kind of solving that specific issue to make sure that we are, in fact, addressing the right issue.

### ***Be a Champion of Design Thinking***

This theme describes SME leaders and employees who effectively build cross-functional team collaboration and “sell” design processes internally, horizontally, and to their colleagues. Co-creation in diverse groups is positively associated with increased innovative outcomes and needs to be fostered (Androutsos & Brinia, 2019; Glaveanu & Taillard, 2018). To break prevailing habits, buy-in into design thinking from employees and managers is essential (Bjoerklund et al., 2020). SME leaders can further champion design thinking by creating the physical space to host innovative workshops, developing a design-knowledgeable workforce, and developing a shared vision (Wrigley et al., 2020). The interviewed experts discussed the challenges associated with being a champion of design thinking, including building cross-functional teams and obtaining buy-in from employees.

#### Participant 1:

What I found is you can't just come in, boom with a problem-solving thing. You have to go through some rapport building. You have to go through some intentional inclusion-type exercises, as I call them, to really get the group emotionally committed to each other and make those emotional deposits with the team between the team. Really build the trust, right? And you have to build trust across those internal boundaries.

Participant 2:

I think, to champion design, there is also the possibility to create isolated teams with isolated cultures, which is not affected by the culture already established in other teams. So this team forms, if it is possible for them, to figure out their own culture and ideas about how they want to work and for a designer in there will most likely result in less conflict and grant more legitimacy than putting them into established cross-functional teams or having teams adopt other members and then becomes a cross-functional team: You were a team of engineers before, but now you have to work with other people, that are not familiar with your context or your processes.

Participant 3:

You can have, for example, an engineer who starts to do more about blockchain and artificial intelligence, who happens to bring the conversation at work. So, you have some form of spillover, which becomes a form of contagion in terms of how ideas transfer; I believe this the same way. You want to have someone that got exposed in the first place to design as a function of value and, little by little, start working on cross-functionality. So don't see this as a single prime engine that designers move into the organization. I see this as more as, per referral, that over time gets integrated into SMEs.

***Be a Role Model for Managing Change and Uncertainty***

This theme describes leaders and employees who advocate uncertainty, experimentation, and disrupting prevailing mindsets and allow needed changes to implement design thinking tools. Managing change requires aligning the strategic vision with the directives to guide employees (Wrigley et al., 2020). SME leaders can embrace uncertainty by elevating the company's capabilities with improved individual competencies that can be built through training and measured with KPIs (Ferrara & Lecce, 2020; Wrigley et al., 2020). The participants described the challenges of managing change in an SME and embracing uncertainty and experimentation.

Participant 5:

And I think they're the friction really is about if we think about these kinds of just individual professionals working together as a team, how a lot of it has to do with different ways of handling uncertainty. So, engineers typically would want to kind of control the unknowns and limit kind of risk through kind of controlling and predicting unknowns, whereas designers control or manage uncertainty by exploring those uncertainties early on, rather than kind of cutting them outside of the scope. So, they're kind of support in the early phases would be key.

Participant 7:

This has got a lot to do with how a company adapts to change, right, and the underlying culture that exists within it. I think the business owner working through the managerial structure was the key to socializing and getting that buy-in, and then directing the initiative to the respective teams.

### ***Transparency With Communication and Breaking Down Silos***

This theme describes the ability to distribute and diffuse information across isolated silos by adapting the language to the silo-specific cultures. SME leaders can foster design with open conversations and participative collaboration between diverse actors (Manzini, 2016). Isolated silos must be broken up to foster design thinking tools (Carlgren et al., 2016; Elsbach & Stigliani, 2018). The participants discussed the challenges associated with communication and isolated silos within SMEs.

#### Participant 1:

So, you really have to break through the collaboration, the walls that are erected to prevent collaboration, which, you know, design thinking is a great tool, but you really have to create the social connections first. The social contracts have to exist whenever you're moving into. Design thinking is really as, you know, a methodology of social problem solving, right? And so, it's a socialization issue—more than anything. And so, when you get micro cultures within the organization in the various departments, things can get political. So really breaking that down. If you really want to have a good design implementation, everybody needs to really be vulnerable. And you need a free flow of ideas.

#### Participant 7:

I think experimentation and, you know, team accomplishments moving through these processes. You have to share that because they are wins for the company. And, one of the ways that you can do that is through either monthly business

reviews with the corporate team sitting there talking about what the results are and how it yielded the data that came out of the process. What you're going to do with that data, and then ultimately how you're going to move it forward. In terms of the new, the actual design strategy itself, you could put up things in like, you know, staff rooms and meeting boards to say, you know, to show the process of what design thinking is in visual terms. You can send emails and talk about how design thinking has, or design strategy has found these results. And this is what we're going to implement. So that transparency is not just within the team. It's sharing the results of what's been found across the company [...] It's not just warm, fuzzy, and it's not just the latest new thing. There's actually a lot of value to it, right?

### ***Seek Support From External Consultant/Facilitator***

This theme describes the willingness and acceptance to recruit external design thinking consultants to facilitate the implementation of design thinking tools into the SME and its business strategy. One SME-specific challenge to implementing design thinking is their unfamiliarity of working with external partners (Magistretti et al., 2020; Wrigley et al., 2020). The participants discussed building design thinking knowledge challenges without external consultants/facilitators.

#### **Participant 1:**

One of the key things also is to bring in an external facilitator. You know, an external facilitator is seen as someone who's not political, not within the company

does not have any preconceived notions. And they're much more successful design initiatives when they're facilitated externally. [...] So bringing external people in is a big boost. Cross-functional is very important, but cross-boundary outside of the firm is vitally important. You really have to get out of the group thinking and the tribal knowledge within the company and pull stakeholders from outside of the company.

Participant 2:

I think it would be necessary to not only make people do design thinking, but also to hire people familiar with design thinking. There is a lack of people doing that because our education, as pointed out earlier, is actually not facilitating any kind of design knowledge training in school or later on in university but just trying to make someone with a totally different background, do design thinking will be a very challenging problem. [...] It needs to be shown right in the workshops, or in your workshops or events, or whatever - how the company tries to incorporate designers to do what they need to, define a goal, and how it should help embed to align the sentiment in the cross-functional departments if they have no experience working with designers.

Participant 5:

Well, again, if you're kind of interested in high-level design expertise, those tend to be quite expensive senior designers. So, the good example where we've seen that have been mainly current of having designers join on the board of a startup,

or then kind of, even if they join afterward to the company join as partners so kind of getting part of the ownership as well.

***Treat All Employees as Important Stakeholders in the Firm's Future***

This theme describes an SME leader's efforts to engage and excite employees for design thinking activities to create champions who effectively collaborate and sell the idea to their colleagues by actively including every employee. SME leaders foster design-friendly cultures by empowering employees to observe, reflect, take action, and accept initial failure on the road to success (Kolko, 2015). Engaged employees are critical for the success of cross-functional teams and the implementation of design thinking (Bjoerklund et al., 2020). The participants described the challenges of engaging all employees and treating them as essential stakeholders.

Participant 4: “And then you make decisions around that awareness or that shared understanding, the better chance you have of, I think, having really satisfied employees because they feel like they're sharing a similar purpose, and ultimately satisfying the customers more.”

Participant 7:

A good opportunity for the business leader is to be willing to talk about this in a town hall with the employees. [...] It's about communicating across the entire organization - that we're going to take a new approach to doing things. It's going to follow a design thinking approach. It's more holistic, it's going to involve cross-team implementation and discussion and collaboration. And then ultimately, at the

project level, where you've got those frictions, you can just point to the strategic strategy, the overarching strategy, and say this is part of this. This is why we're doing this. And hopefully, that kind of helps align everybody to that common strategic goal for the business owner.

### ***Coach Employees to Champion Design Thinking***

This theme describes an SME leader's effort to continuously engage employees who effectively build cross-functional team collaboration and "sell" design processes internally, horizontally, and to their colleagues. Besides their support and commitment, SME leaders must foster cross-functional collaboration to elevate design (Knight et al., 2020). Employees can be engaged with transparent organizations and participative collaboration (Manzini, 2016). The participants discussed the challenges associated with coaching employees to champion design thinking.

#### Participant 3:

You want to have someone that got exposed in the first place to design as a function of value and, little by little, start working on cross-functionality. So don't see this as a single prime engine that designers move into an organization. I see this as more as, per referral, that over time gets integrated into SMEs [...] So, I would say, keeping some of these readings, conversations, trends, as part of the organization so that it doesn't necessarily become just a lunch break read, but it's becoming an engagement or a conversation over coffee at work with colleagues is

a way for this information to eventually penetrate, contaminate, changes a bit the cultural ethos.

Participant 1:

So when you bring those people together, and they solve a problem, if the company doesn't follow through with that, they run the risk of disengaged, right? It really can become a de-motivator and de-engage people from the company if they're not committed to following through with what the team thinks is a solution. Commitment is a big deal.

Participant 2:

I think, to champion design, there's also the possibility to create isolated teams with isolated culture, which is not affected by the culture already established in other teams. So this team forms, if it is possible for them, to figure out their own culture and ideas about how they want to work and for a designer in there will most likely result in less conflict and grant more legitimacy than putting them into established cross-functional teams or having a team adopt other members and then becomes a cross-functional team.

***Support Successful Designer Experiences for the Non-Designers***

This theme describes the effective and honest distribution and diffusion of information of design thinking outcomes by considering design language versus silo-specific cultures to preserve the information content. SME leaders need to emphasize employee communication effectively (Kolko, 2015). SME leaders must improve

communication and delivery to improve collaboration between design thinkers and other groups (Roper et al., 2016)

Participant 4: “Designers talk really differently in language that feels really fuzzy. And it takes a while to figure out that that's useful information.”

Participant 6:

The main issue with design thinking is that folks from traditional functions see it as “fluff” and non-scientific. Designers who can talk to folks from other functions – as knowledgeable in those functions - are more likely to convince them of the merits of design thinking.

Participant 7:

Start involving everyone on the team in the dialogue because I think transparency - and this is a really key point - transparency to that process is the defining edge in today's business, right? So don't be afraid to experiment and fail. [...] ? And I've had a lot of people look at these things and think, “Oh, God, that's the new fluffy thing that we're talking about today”. But it's not - it actually works. And the other side to this is, I think, you know, we talked about transparency, I think it's important that you be willing to share failure as well. Right? The whole point of doing experimentation is because you don't know what the results gonna yield. And sometimes those results don't yield good data at all.

Participant 3:

So, to me, communication, of course needs to cascade down to a point which is becoming first of all distributed and diffused. And the diffusion - if you diffuse, more by scaling the information out - tends to decrease the natural tension you have in information dissonance.

### ***Effectively Manage Resource Allocation and Constraints***

This theme describes the proactive project management of design thinking efforts in an SME to plan and allocate needed resources and manage related constraints. Design thinking must be granted legitimacy to receive resource allocations and influence decision-making beyond task-related issues (Micheli et al., 2018). SME leaders enable investments and set directions (Micheli et al., 2018). The participants discussed the challenges associated with limited resources.

#### **Participant 2:**

The first concern would be time constraints of managers - of managers and employees in general. And, you do not usually have a dedicated innovation department, which is concerned with matters related to a design strategy or innovation management. I would put these two things in similar buckets if you so want. So, design strategy and innovation management - I'm referring to who would lead a design strategy, the CEO with the CTO, who would do this in small and medium-sized enterprises.

#### **Participant 3:**

What I would do if I was a small business owner is to start having project management defining the cross-functionality of teams by allocating resources, ownership accountability so that it's becoming more of a collective effort. I think thinking in terms of project managers in these specific cases does help a lot to justify why people from different departments might want to work together.

### ***Continuous Formal and Informal Information Sharing***

This theme describes the continuous efforts of formal and informal communication to ensure that information can reach the right stakeholders, foster mutual understanding, and transform existing cultures. Continual horizontal and informal communication between specialized groups fosters mutual understanding and, thus, improves group performance (Senge, 2015). The participants described the challenges of continuous formal and informal information sharing.

#### Participant 3:

So that's really more about how you make sure that you're constantly translating the conversation across the different departments and also making sure that the translation is taking into account the cultural traits that are actually part of the subculture of departments. [...] Finally, formal and informal processes need to be deployed to make sure that this information can reach the right stakeholders.

#### Participant 5:

The larger communication challenges are when you have an established but small company, so still an SME. But a company that has been around for, let's say, five

years or 10 years and already has an established way of working and established market and established customers, even if they're on a small scale there I think the collaboration needs a bit more support in order to kind of really understand what comes.

### ***Provide Adequate Resources***

This theme describes an SME leader's commitment to sufficiently plan, allocate, and manage resources for design thinking efforts to improve the outcomes. SMEs often fall behind with innovation strategies due to limited resources, such as budgetary constraints, time, and lack of human resources (Magistretti et al., 2020; Naradda Gamage et al., 2020). The participants discussed the challenges associated with a lack of resources allocated to design thinking efforts.

#### Participant 2:

And looking at what the leader can do specifically, you do not know if you hire the right person to do this job, but the leader can legitimize what the design thinker is doing in their company by pushing for change, by facilitating change the ways I explained before. So, building projects legitimize different procedures when compared to the past, by advocating change, by advocating more user-centricity, by also basically a company with challenges giving, like putting out a name under it, not only trying it out and then if it succeeds, but also if it fails, and to advocate a culture of learning and to fail to succeed. I think these are things

that leaders should consider and can easily do to support design thinking in their own organization.

Participant 3:

We tend to have a poor allocation of resources when it's about managing projects. And by extension, if you start managing projects through a cross-functional team, you expand the longevity of a project as more institutional. So, what I would do if I was a small business owner, is to start having project management defining the cross-functionality of teams by allocating resources, ownership accountability so that it's becoming more of a collective effort.

***Adapt to Market Circumstances***

This theme describes an SME's continuous rethinking of how the business operates and validations of the market by employing design thinking to tap the collective minds of many people and seek validation from the market. The reiterative design thinking approach allows SMEs to gain in-depth insight, while collaborative practices create new knowledge about products and markets that suit the corporate strategy (Knight et al., 2020). SME leaders use design thinking to challenge existing assumptions quickly, develop solutions, and implement new practices creating resilience and competitive advantage (Cankurtaran & Beverland, 2020). The participants described the challenges for SMEs associated with changing market forces needing adaption.

Participant 3: “Implemented design thinking at any level of the SMEs makes you gain competitive advantage when you are getting a quick validation from the market and rapidly adapting your production cycles.”

Participant 7:

That is where experimentation, and at least researching to figure out if that's the right approach, is getting critical for where there's machinery involved and things like that. But ultimately, creating that competitive advantage. It's kind of key that it's not just a one and done thing is a continual approach. It's like software development these days. You don't just throw out one solution a year, right? You do continuous integration, continual development, and push features out periodically because the market shifts. It's a similar thing with design thinking. It's a methodology, and it's an approach to continually keep the business moving so that you can make it take advantage of what comes out of it.

### ***Ability to Sustain Value Creation With an Innovative Business Model***

This theme describes an SME business model that employs design thinking to monitor market validation continuously and uses a customer-centric approach to sustain value creation. Changing legal, environmental, and economic challenges force SMEs to innovate to remain sustainable (Khurana et al., 2021). With design thinking, SME leaders might positively influence strategic thinking, organizational learning, and further competitive advantage to sustain value creation (Elsbach & Stigliani, 2018). The participants discussed the challenges of sustainable value creation in the long term.

Participant 1:

The ability for a firm to adapt is critical. Adaptability is one of the keys to resiliency. Resiliency is survivability, sustainability. And so, the ability to build design thinking and social problem type problem solving into your organization creates adaptability in the long term.

Participant 5:

SMEs might not have the resources to parallelly experiment with, you know, 20 different product lines. So, what you do develop, you want to make sure that that actually is in service of a specific market need that you are in a good position to identify. So design thinking can help in that kind of identifying what that right issue would be exploring the kind of stakeholder ecosystem value creation ecosystem and kind of see what those opportunities would be, as well as then help in the actual experimentation development in those, so, doing small kicks scales, but pilots to kind of decrease the risk and learn from those and engaging other partners onboard into these prototypes or things of small scale experiments to build that demand. So, kind of allowing the effective allocation of resources in a way that is viable and a longer-term rather than just kind of works for short term by identifying those underlying needs.

Participant 4:

This focus on customers helps long-term sustainability because it helps me connect to the social and emotional needs, not just the functionalities. And it helps

me see the entire journey as it sits around that product. So now maybe I'd have to really next step up to the anaesthesiology example. But, you know, maybe there are steps prior to the operating room where I'm collecting data on the patient that I could somehow integrate with the equipment in the operating room and make it all a more seamless experience and safer for the patient. And so, so long-term growth to me means that I'm able to expand my offering.

### ***Immediate and Strong Responsiveness as Markets Evolve***

This theme describes an SME's ability to quickly adjust to changes in the market by continuously reiterating in constant contact with the customers with diverse perspectives and using a design-centric response. Research indicated that design thinking is an agile innovation approach for large-scale enterprises to develop absorptive capacity (Cousins, 2018a). The participants discussed the challenges of SMEs' absorptive capacity and ability to quickly respond to evolving market environments.

#### Participant 7:

It's the concept of absorptive capacity ready to take new ideas and evolve in order to make things better. So, you're learning, it's a learning culture. I think organizations that work in a matrix fashion, where their work across departments, can't consistently... they're going to adapt far easier to any new process than a business that exists as silo groups that don't mingle on a daily basis is.

#### Participant 5:

By doing those experiments and kind of taking a closer look at that right issue to be solving in the right place in the first place, we can identify needs that are more long term we can see emergent needs that might be only coming in the market.

### *Invest in a Deep Understanding of the Customer*

This theme describes an SME's allocation of resources to develop a shared understanding of the customers' experience permeating the entire company. Today's chaotic markets require SMEs to understand customer needs intimately (Beckman, 2020; Brown, 2008). Design thinking is a tool to obtain that understanding but requires organizations to develop expertise and experiences (Sciotto, 2020). SME leaders must allocate considerable time and resources before successfully managing design thinking processes (Carlgren et al., 2016). The participants discussed the challenges of developing a deep and shared understanding of customer needs.

#### Participant 4:

I am going to go back to customer-focused. I think there's a lot of evidence that more deeply understanding customers improves the success of new products and services. And by the way, that research has been going on since at least 1973. I haven't tried to go back before that, but there have been studies since then, periodic studies of the success and failure of new products and lack of understanding of customers are always, if not at the top of the list of the top two or three items. [...] I think that in whatever fashion you bring the customer alive for the company. And then you make decisions around that awareness or that

shared understanding, the better chance you have of, I think, having really satisfied employees because they feel like they're sharing a similar purpose, and ultimately satisfying the customers more.

Participant 1: “Because today's innovation is tomorrow's normal, right? And so, you know, you've got to constantly be in contact with the end-user to understand the need.”

### ***Build a Service Ecosystem Around Products to Create an Experience***

This theme describes the development of services and solutions around existing products that emerge from an in-depth understanding of the customers' experience. Design thinking steps such as journey mapping visualize how customers and users experience the company's products and services and help identify new opportunities (Elsbach & Stigliani, 2018). A cross-functional team balances the consideration between design with commercial considerations and drives the formalization of product and service development processes (Ferrara & Lecce, 2020). The experts discussed the challenges of identifying and implementing opportunities to build a service ecosystem around existing products.

#### Participant 1:

There are two things that I would say most manufacturing companies, their problem is. Number one, they don't know what's unique about them. And then number two, they are too focused on just the product that they're producing. And they don't think of the end-user in the context in which it's being used. So, they

don't think about all the other needs that the end-user has around their product.

When they do, they can start thinking about how they can bundle up other services and solutions to meet a need getting the manufacturer to understand, you know?

Participant 2:

And design thinking is inherently about user-centricity and building a solution embedded in an experience for the user, and, I think, this will gain or has gained a lot of traction. Companies that are able to market their product as part of a bigger overall value cooperation process and experience have gained more consumer or customer trust compared to companies just shipping the product. With increasing price and quality pressure from Asia and so on, and probably from a German or middle European standpoint, where we had a lot of engineering championships in the past years, Asia has grown stronger, right? And they have a cost advantage on that side, often, and in order to utilize the years or decades of experience, creating not only products and ship products in large numbers but also try to be very open to tailor the products to customer expectations and building an overall service ecosystem around these products to create a whole experience around this product and services that facilitate implementing the product into production facilities. Doing things like predictive maintenance, doing things like maintaining the product or the drive or whatever, is detrimental to gaining customer trust and remaining in the field building stronger customer relationships.

### ***Rapidly Adapt Production Cycles to the Market***

This theme describes how SME leaders can use design thinking to receive a quick validation from the market and rapidly adapt production cycles by prototyping. Design thinkers employ rapid prototyping to verify ideas' feasibility, viability, and desirability (Elsbach & Stigliani, 2018). With design thinking, SME leaders can quickly develop solutions and implement new practices (Cankurtaran & Beverland, 2020). The participants described the challenges associated with the quick adaption of production cycles when the market requires it.

#### **Participant 3:**

So, design thinking is an instrument to gauge understanding of the market and is not necessarily a definite or final instrument. But it is a form of prototyping and feedback that you can integrate back into some form of operational effectiveness, redesigning production cycles. So implemented design thinking at any level of the SMEs makes you gain competitive advantage when you are getting a quick validation from the market and rapidly adapting your production cycles.

**Participant 6:** “I think you waste less when you fail via short-run prototypes than full-run manufacturing.”

### ***Equal Intrinsic Value to the Product and the Customer Needs***

This theme describes how a manufacturing SME leader must give equal value to the goals of product manufacturing and what the customer needs from the product.

Schein (2017) described organizational culture as a composition of espoused values,

thinking habits, mental models, implicit standards and values, shared meanings, formal rituals, and additional ancillary components. The author defined three levels of organizational culture: The most tangible level describes artifacts. Artifacts can be behaviors and phenomena that can easily be observed. The second level is espoused beliefs and values that may or may not match what can be seen. The third level describes underlying basic assumptions based on intrinsic beliefs and values (Schein, 2017). Participants expressed concern that manufacturing SME leaders apply greater intrinsic value on just manufacturing a product and may not be focused on meeting customer needs during the product manufacturing process. This basic assumption would preclude a manufacturing SME leader from giving equal weight to the customer-centric experience as they would to just manufacturing a product without outside input; this assumption calls for manufacturing SME leaders to re-evaluate their organizational culture to gain a competitive advantage in today's market.

Participant 2: "Doing things like predictive maintenance, doing things like maintaining the product or the drive or whatever, is detrimental to gaining customer trust and remaining in the field building stronger customer relationships. "... others said similar things.

Participant 4:

So I would say that's the path to success is really putting the customer front and center and obviously, you know, you know, the desirability viability feasibility thing and the it's not like, not like we're saying that business outcomes don't

matter. But I get that all the time. Yes, we have to make decisions on for the business and the thinking, you can actually have both. Yeah, in fact, the more you think about the customer, the more opportunity you might create for the business to make more money revenue growth comes from the discovery of additional problems that you can solve that you might not have recognized today, so. So that's, that's sort of my short version of that. I think that in whatever fashion you bring the customer alive for the company. And then you make decisions around that awareness or that shared understanding, the better chance you have of, I think, having really satisfied employees because they feel like they're sharing a similar purpose, and ultimately satisfying the customers more.

***Consistent Attention to Performance Metrics and Their Diverse Meaning Across Departments***

This theme describes the SME leader's awareness of silo-specific cultures and the ability to translate performance metrics into their specific languages. Existing silos continue to present leaders with challenges in successfully driving their firm's design thinking as an innovation strategy to support business (Wrigley et al., 2020). The participants discussed the challenges of existing subcultures within the SMEs that assign different meanings to metrics and language.

**Participant 3:**

Looking at algorithms and performance efficiency, let's talk about, you know, the technology department. In technology stances, reaching the highest level of

efficiency is a must. So if your algorithm has an efficiency of prediction of 99% - That's great. Now for the businesspeople, 99% has a marginal value than maybe 85%, because 85% is good enough for what they need to do. So, the number doesn't mean the same as for the department and the technology department. Because the essence of the job merely requires different kinds of premises. So, sometimes understanding that numbers are translated into constructs, not necessarily with the same nominal value that number might have, helps to understand what we were mentioned before, that form of translation of information according to who are you dealing with, [...] That's really more about how you make sure that you're constantly translating the conversation across the different departments, and also making sure that the translation is taking into account the cultural traits that are actually part of the subculture of departments. So, for translating information in the IT department, it might not necessarily be meant the same if the same information is arriving at the operation department or the marketing department. [...] But that subculture does not necessarily easily relate to another subculture with the factor 1:1. So you need to understand that sometimes even numbers mean very different depending on whom you're talking to.

Participant 4: “So, one of the things I think designers have to do is, first of all, they have to learn the language of the other people.”

*Create an Innovation Mindset Across the Company*

This theme describes the cultural understanding of an SME leader that allows creating a shared understanding of the need for innovation and creates rapport and inclusion across every department to get their buy-in. Physical space to host innovative workshops, developing a design-knowledgeable workforce, a strategic vision, and proper directives are essential components to encourage employees to acknowledge the need for design thinking to innovate and, ultimately, get their buy-in (Wrigley et al., 2020). The participants described the challenges of creating an innovative mindset and obtaining employee buy-in in SMEs.

Participant 5:

As soon as you introduce people outside of the organization into those workshops, it helps to create the buy-in and also kind of helps to create, how would I say, external pressure and demand for this so which makes it then less risky to use the same methods later on.

Participant 6: “Making the ideas of experimentation and rapid prototyping seem acceptable – through top-down role-modeling from leaders - is essential to getting people to buy into a design thinking approach.”

Participant 3:

And I think this is our clear benefit, why design thinking like many other techniques are great, not only to improve the efficiency, you can always measure that, but also to create a mindset where innovation is not the department, is becoming the only way you have to engage with a quite shorter span of control.

### *Diffuse Communication Into all Layers of the Organization*

This theme describes an SME's ability to ensure that distributed information permeates throughout the company to decrease the natural tension in information dissonance by considering the various subcultures of isolated silos. SME leaders need to understand internal users to communicate effectively (Kolko, 2015). The experts identified the challenges associated with the optimal distribution and diffusion of information.

#### Participant 1:

That is a problem sometimes of the makeup, especially when you have engineers and managers, you know? I do a lot of work around people's culture, so I tried to do the communication in the room, face-to-face with the people in the group. You know, because relying on email and other impersonal forms of communication loses a lot. The biggest, probably one of the biggest things, you deal with is the relative emotional intelligence and the personalities involved. So, you know, a lot of the work I do, we do a lot of underlying work to understand the makeup of the team as far as from a personality standpoint.

#### Participant 3:

Communication tends to happen top down, but it doesn't necessarily diffuse into the layers of the organization. So that's really more about how you make sure that you're constantly translating the conversation across the different departments, and also making sure that the translation is taking into account the cultural traits

that are actually part of the subculture of departments. So, for translating information in the IT department, it might not necessarily be meant the same if the same information is arriving at the operation department or the marketing department.

### ***Continuous Research, Professional Development, and Experimentation***

This theme describes an SME's culture to advocate a learning culture that embraces continuous research, professional development, and experimentation. SME leaders must foster professional development related to design thinking (Beckman, 2020). Internal design thinking knowledge can be developed through training (Wrigley et al., 2020). The participants discussed the challenges associated with the needed professional development to drive continuous research and experimentation.

#### **Participant 2:**

You try to visualize ideas and then frame a common language, a common goal, and this usually does not resonate well with people not educated in this area - which leads me to another issue. The business and engineering background, which a lot of people in managerial positions or in operational positions have often, does not include design education, design thinking education, or education related to different thinking modes.

#### **Participant 7:**

Design thinking is going to produce the results that redefine that business if the business is willing to consider that approach. So, experimentation and research to

find the best fit. But you know, in a manufacturing process, making changes like that, it's going to be capital intensive, right? So, it can be super costly. And I think that's where experimentation, and at least researching to figure out if that's the right approach, is getting critical for where there's machinery involved and things like that. But ultimately, creating that competitive advantage. It's kind of key that it's not just a one-and-done thing is a continual approach [...] Yes, I mean, anything that's a competitive advantage is something that you're doing that your competitor is not, right. So, if you're just following a design thinking approach to becoming leaner and faster and finding different ways to approach the market, you're automatically getting the benefits of competitive advantages over your competitors.

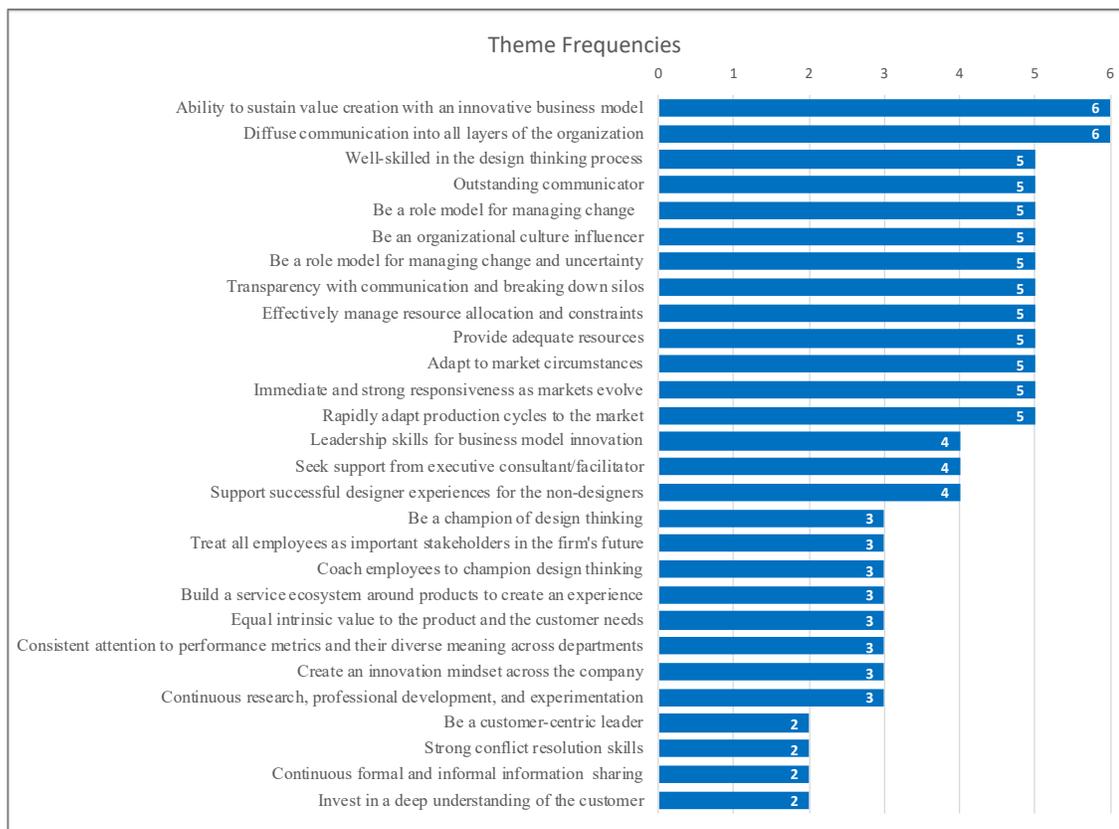
### **Second Phase: Cross-Case Synthesis and Analysis**

Cross-case synthesis is recommended for data analysis to strengthen the trustworthiness of data and provide rigorous multiple case study results (Merriam & Tisdell, 2015). The analytic process includes both within-case and cross-case analyses for multiple case study designs to identify patterns within the data. In later stages of the analysis, related literature is often introduced to refine constructs and theoretical assumptions (Halkias & Neubert, 2020). Besides, using a cross-case synthesis technique helps achieve an organized analysis of the reasoning connecting the research data to the study's conceptual framework (Cooper & White, 2012; Yin, 2017).

Conducting a cross-case synthesis method aims to discover the divergence and convergence between the cases through the data and separate isolated data from the analysis process (Halkias et al., 2022). I used the cross-case analysis method in an iterative process to analyze the data across the study's seven cases, allowing me to identify the themes and patterns across design thinking experts' views. As seen in Figure 1, each theme's cumulative frequency of occurrence shows the cross-case analysis of the convergent and divergent data across the seven cases.

**Figure 1**

*Cross-Case Synthesis Results (Theme Frequency of Occurrence by Participants)*



In my study, the expert's role is that of someone who possesses *contextual knowledge* in addition to *technical* and *process knowledge*. My study's expert and elite interviews also had an explorative function focused on *interpretative knowledge* (Littig & Pöchhacker, 2014). Orientations, interpretations, and evaluations from the interview data were explored to formulate guidelines for further research into new theoretical directions. Expert interviews can be interpreted as theory-extending interviews using thematically focused narratives through participants presenting their perceptions and beliefs (Van Audenhove & Donders, 2019).

Exploratory interviews with experts and elites should be conducted as openly as possible in order to make it possible to gather an incredible breadth of information and interpretations. The goal of the expert interview in this study, as recommended by Witzel and Reiter (2012), is to permanently revise a study topic while advancing a specific body of knowledge. The scarcity of applied knowledge in embedding design thinking strategy in small and medium-sized manufacturing firms calls for new thinking grounded in scholarly and practitioner-based knowledge.

Flick (2018) wrote that there is no one way of conducting expert interviews, nor is there a standard procedure for analyzing such interviews. Any qualitative social research analysis methods can be used for analyzing primary data from expert interviews, including the code-based techniques commonly used in the qualitative thematic analysis (Bogner et al., 2018). This paragraph presents the two sets of prominent themes emerging from the cross-case analysis—those discussed by five and six participants. No one

particular theme was discussed by all seven participants. In formulating implications for the study and focused recommendations for further research in Chapter 5, my interpretive narrative will be based on the frequency with which expert-generated themes occurred together in at least five out of the seven cases (Rosenthal, 2018). Eleven themes that figured prominently across the data collected from five cases were (a) well-skilled in the design thinking process, (b) outstanding communicator, (c) be a role model for managing change, (d) be an organizational culture influencer, (e) be a role model for managing change and uncertainty, (f) transparency with communication and breaking down silos, (g) effectively manage resource allocation and constraints, (h) provide adequate resources, (i) adapt to market circumstances, (j) immediate and strong responsiveness as markets evolve, and (k) rapidly adapt production cycles to the market. Two themes that figured prominently across the data collected from six cases were (a) ability to sustain value creation with an innovative business model and (b) diffuse communication into all layers of the organization. The implications of the managerial practice and research of these prominent themes will be further analyzed in Chapter 5.

### **Triangulation**

Data triangulation assisted me in assuring the trustworthiness of my study's results and improving the methodological rigor of the study as a whole (Stake, 2013). Hence, as a qualitative researcher, I ensured appropriate instruments that would yield themes to support insights resulting from meeting the purpose of the study. I used an audit trail to track the evidence gathered throughout the study's development (Stake,

2013). My investigation used multiple sources of evidence during the data collection process to explore various experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. Three sources of data were used throughout this study: (a) a semistructured interview protocol (see Appendix B) whose items have been designed and standardized by previous researchers, (b) archival data in the form of practitioner-based business reports on implementing design thinking as a business strategy (see Yin, 2017), and (c) reflective field notes (see Merriam & Tisdell, 2015), which were kept by the researcher throughout the entire data collection process.

Data triangulation was used to corroborate facts found within the multiple data sources (Farquhar et al., 2020). My positionality and reflexivity were supported through accurate interview transcription (Berger, 2015). The credibility of findings was also sustained by conducting transcript reviews during the member checking process allowing participants to review and correct their transcribed words for any inaccuracies (Merriam & Tisdell, 2015). The interview transcripts were supported with handwritten notes where additional detail such as pauses, tone of voice, speed, pronunciations, and the expression of vocal and word patterns was captured. The experts' inflections complemented their verbal responses and yielded more comprehensive documentation of the conversation with the participants.

To further strengthen the trustworthiness of the study's data analysis, I conducted a triangulation of data sources (Halkias et al., 2022). I read approximately 380 scientific

peer-reviewed scholarly articles and journals that allowed me to increase my understanding of the research topic and continue the method triangulation process to answer the research question. Out of those approximately 420 publications, I found around 200 closely relevant to my research, including government, media, and business reports, and annotated them. Although not all these articles were substantial enough to be considered in the literature review, they expanded my understanding of the research topic and were used as a source to complement the semistructured expert interviews. With the help of these archival data, I was able to identify and articulate recurring concepts and themes emerging from the data analysis grounded in the conceptual framework. Triangulation, as such, enhances the richness of data (Farquhar et al., 2020). Study results and findings were analyzed and interpreted within the context of the conceptual framework and how these findings extend theory. Findings in a multiple case study confirm or extend the existing knowledge in the discipline, as each case presented can be grounded in the reviewed literature (Halkias & Neubert, 2020).

### **Summary**

In this chapter, I presented a case-by-case analysis of seven participants, followed by a cross-case synthesis analysis to answer this study's central research question: "How do design thinking experts describe how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?" This multiple case study revealed the views of

subject matter expert participants, which emerged from the data analysis and can be attributed to the related themes and patterns presented in the study results.

This study's data analysis process was completed following a two-step process: (a) a thematic analysis of the textual data and (b) a cross-case synthesis analysis (see Yin, 2017). Six codes arose from data collected in this multiple case study, which included a total of 28 themes, delivering rich data from participants' experiences. The six conceptual codes that emerged are (a) leadership competencies for implementing a design strategy in SMEs, (b) leading a cross-functional team to adopt design thinking, (c) sustaining design thinking within a cross-functional team, (d) developing a design thinking business model for sustainability, (e) gaining competitive advantage with a design thinking business model, (f) embedding design thinking in a manufacturing SME to drive competitive advantage.

I used cross-case analysis and synthesis as a data analysis technique to consolidate critical findings from the individual case study as soon as themes across the multiple cases were arranged. The 28 themes that emerge from the data analysis include (a) leadership skills for business model innovation, (b) well-skilled in the design thinking process, (c) outstanding communicator, (d) be a role model for managing change, (e) be a customer-centric leader, (f) strong conflict resolution skills, (g) be an organizational culture influencer, (h) be a champion of design thinking, (i) be a role model for managing change and uncertainty, (j) transparency with communication and breaking down silos, (k) seek support from external consultant/facilitator, (l) treat all employees as important

stakeholders in the firm's future, (m) coach employees to champion design thinking, (n) support successful designer experiences for the non-designers, (o) effectively manage resource allocation and constraints, (p) continuous formal and informal information sharing, (q) provide adequate resources, (r) adapt to market circumstances, (s) ability to sustain value creation with an innovative business model, (t) immediate and strong responsiveness as markets evolve, (u) invest in a deep understanding of the customer, (v) build a service ecosystem around products to create an experience, (w) rapidly adapt production cycles to the market, (x) equal intrinsic value to the product and the customer needs, (y) consistent attention to performance metrics and their diverse meaning across departments, (z) create an innovation mindset across the company, (aa) diffuse communication into all layers of the organization, and (ab) continuous research, professional development, and experimentation.

Using a triangulation method through three different data sources, including a semistructured interview protocol, archival data from practitioner-based design thinking articles (see Yin, 2017), and reflective field notes (Merriam & Grenier, 2019), ensured the trustworthiness of the research's data. The results of this multiple case study were analyzed and interpreted through the study's conceptual framework, consisting of two concepts developed by Bjoerklund et al. (2020) within their integrating design across the organization model: a) the concept of co-evolving design capabilities and b) the concept of the design-driven organization. The extant literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare,

leading to a literature gap on how SME leaders can practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020; Roper et al., 2016). Previous researchers highlighted that without a practical roadmap to championing design processes horizontally, SME leaders would sabotage the cross-functional collaboration needed to adopt design thinking processes effectively (Ferrara & Lecce, 2020).

This qualitative multiple case study's purpose was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. Strategy-as-practice scholars called for further empirical research to fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020). This study is significant to theory by contributing original qualitative data to Bjoerklund et al.'s (2020) integrating design across the organization model on developing co-evolving design capabilities within project teams to further cross-team collaboration in the design-driven organization.

In Chapter 5, I will present an interpretation of the findings from this study 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 further describe how my study extends on the body of knowledge on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

## Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. To meet the purpose of the study and address this documented knowledge gap among manufacturing SME leaders and be consistent with the qualitative paradigm, a multiple case study design (see Yin, 2017) was used to collect data from a purposeful sample of design thinking experts.

To address the research problem and purpose of the study, I used qualitative data collected from multiple sources of evidence, including interviews, archival, and reflective journaling notes (see Merriam & Tisdell, 2015). Using qualitative research methodologies and data triangulation, I gathered data that reflected on the perceptions shared by participants in the study on managerial competencies needed to implement strategic change in small and medium-sized manufacturing firms to successfully drive design thinking within their firm as an innovation strategy. Furthermore, the interviews allowed participants to further elaborate on their personal experiences and identify any discrepant data to emerge (Halkias et al., 2022).

New theoretical knowledge emerges from recognizing patterns in the collected data of a multiple case study and the logical arguments that underpin them (Eisenhardt et al., 2016). This study was framed by Bjoerklund et al.'s (2020) integrating design across the organization model, which explains how to develop coevolving design capabilities

within project teams to further cross-team collaboration in the design-driven organization. Using a multiple case study approach was particularly useful for my study design because it gave me the flexibility to iterate previous assumptions from scholarly studies to extend a theoretical model (see Halkias & Neubert, 2020; Stake, 2005).

The cross-case synthesis analysis of data from interviews with seven participants revealed the following 13 prominent themes: (a) ability to sustain value creation with an innovative business model, (b) diffuse communication into all layers of the organization, (c) well-skilled in the design thinking process, (d) outstanding communicator, (e) be a role model for managing change, (f) be an organizational culture influencer, (g) be a role model for managing change and uncertainty, (h) transparency with communication and breaking down silos, (i) effectively manage resource allocation and constraints, (j) provide adequate resources, (k) adapt to market circumstances, (l) immediate and strong responsiveness as markets evolve, and (m) rapidly adapt production cycles to the market.

### **Interpretation of Findings**

The findings of this multiple case study confirmed or extended current knowledge in the discipline, with each case presenting examples of issues discussed in the literature review. In this section, the study's findings are presented and reviewed in the context of the six coding categories that emerged from the data analysis: (a) leadership competencies for implementing a design strategy in SMEs, (b) leading a cross-functional team to adopt design thinking, (c) sustaining design thinking within a cross-functional team, (d) developing a design thinking business model for sustainability, (e) embedding

design thinking in a manufacturing SME to drive competitive advantage, and (f) gaining competitive advantage with a design thinking business model.

I compare these categories with relevant concepts from the conceptual framework and the extant literature reviewed in Chapter 2. I provide evidence from the seven semistructured interviews to support how the study's findings either confirm, disconfirm, or extend existing knowledge. This process of analyzing and presenting data evidence for theory extension in a multiple case study demonstrates the complexity of responding to the inductive and deductive evaluation process of qualitative data (Halkias & Neubert, 2020). Extension studies, such as this multiple case study, provide replication evidence and support the extension of prior research results by offering valuable insights and new theoretical directions (see Bonett, 2012).

### **Leadership Competencies for Implementing a Design Strategy in SMEs**

Scholars argued that SME leaders play a central role in providing an environment supportive of design thinking and integrating design thinking into the corporate strategy, enabling investments, and setting the directions (e.g., Micheli et al., 2018; Wrigley et al., 2020). Nevertheless, the challenge for many organizational leaders remains that of building a team of engaged, creative, and connected employees while solving complex business challenges that are uniquely designed for end-users needs (Elsbach & Stigliani, 2018; Mutonyi et al., 2020). My study confirmed that SME leaders must skillfully communicate to employees, mitigate conflicts, develop internal design thinking

competencies, and be role models for change and customer-centricity to implement design thinking successfully.

The study participants confirmed that SME leaders' commitment to design thinking integrations and transparent communication is crucial to obtain employees' buy-in. The interviewees confirmed that leaders must provide design thinking efforts the needed legitimacy to allocate resources correctly. This study aligns with Bjoerklund et al.'s (2020) and Micheli et al.'s (2018) conclusions that incompetent leadership and inadequate access to resources will lower the quality of design thinking outcomes and prevent design thinking from being elevated to a strategic level. My study results extend knowledge-based on Bjoerklund's publication on how leaders can improve their competencies for implementing a design strategy in SMEs by being role models for change, demonstrating customer-centric behaviors, and communicating clearly across the entire organization into all layers.

### **Leading a Cross-Functional Team to Adopt Design Thinking**

Scholars argued that SME leaders need to "sell" design thinking integration across department borders (e.g., Bjoerklund et al., 2020; Ferrara & Lecce, 2020; Wrigley et al., 2020). Cross-functional teams elevate design thinking processes and balance design with commercial considerations (Ferrara & Lecce, 2020). Nevertheless, SMEs still struggle to develop the cross-functional collaboration needed among their employees to adopt design thinking processes effectively (Ferrara & Lecce, 2020). My study results confirmed that contrasting traditional cultures from isolated silos protects existing

mindsets and hinders the development of collective understandings and shared goals. My study further confirmed that cross-functional collaboration is essential for design thinking beyond the operational level.

Study participants confirmed that SME leaders must break down isolated silos that impede developing shared objectives and often end in finger-pointing due to incongruent goals and the need to develop cross-functional collaboration. The study aligns with Elsbach and Stigliani's (2018) findings that fostering cross-functional collaboration supports the successful implementation of design thinking tools and that a culture of siloed specialization will resist the nature of design thinking. My study results extend knowledge on the works of Bjoerklund et al. (2020), Carlgren et al. (2016), and Elsbach and Stigliani (2018) on how to overcome subcultures stemming from isolated silos by influencing the existing organizational culture, seeking help from external experts, and effective diffusion of information across the entire organization.

### **Sustaining Design Thinking Within a Cross-Functional Team**

Scholars described the challenges of sustaining design thinking efforts in organizations due to poor resource allocation, constant conflict with other tasks, and lack of influence over top management team attention and decision-making strategy (e.g., Micheli et al., 2018). My study results confirmed that lack of time and human resources, financial restraints, and daily tasks hinder design thinking efforts, which will eventually hinder integrating design thinking into the organization's innovation strategy.

Study participants confirmed that SME leaders must grant legitimacy to design thinking initiatives to ensure proper and continual resource allocation. The interviewees described how SME leaders could develop employees to design thinking champions and communicate design thinking outcomes to advertise its positive impact. The study aligns with Micheli et al.'s (2018) findings that SME leaders must grant legitimacy to design thinking efforts to ensure autonomy and continuous access to resources. My study results extend knowledge on the works of Bjoerklund et al. (2020), Naradda Gamage et al. (2020), and Micheli et al.'s publication on how SME leaders can secure adequate and continuous access to resources for design thinking efforts and develop employees to design thinking champions to sustain design thinking within a cross-functional team.

#### **Developing a Design Thinking Business Model for Sustainability**

Scholars argued that despite larger organizations implementing design thinking into their corporate strategies, SME leaders remain unsuccessful in adopting innovative design-thinking processes, placing their businesses at a disadvantage for long-term sustainability and competitive advantage (e.g., Eide et al., 2021; Lattemann et al., 2020). My study results confirmed that the reiterative and experimental design thinking approach allows SME leaders to sustain value creation and adapt quickly to market situations.

The study participants confirmed that design thinkers' permanent customer focus and desire for market validation continuously reveal new opportunities and foster flexibility that creates organizational resilience. The study aligns with Cankurtaran and

Beverland (2020) and Cousins (2018a) on that the iterative approach of design thinking allows SME leaders to continuously challenge existing assumptions, develop solutions, and implement new practices quickly, creating absorptive capacity and resilience. My study results extend knowledge on the works of Bjoerklund et al. (2020) and Cousins (2018a) on how SME leaders can develop a design thinking business model for sustainability by fostering experimentation to accelerate production cycles and determine the effective allocation of organizational resources

### **Gaining Competitive Advantage with a Design Thinking Business Model**

Scholars argued that organizational leaders became interested in design thinking to establish a competitive advantage over competitors (e.g., Bjoerklund et al., 2020). Nevertheless, the authors agreed that SME leaders remain unsuccessful in adopting innovative design-thinking processes, placing their businesses at a disadvantage for long-term sustainability and competitive advantage (Eide et al., 2021; Lattemann et al., 2020). My study results confirmed that SME leaders could implement design thinking into their organizational strategies to gain an in-depth customer understanding to help their organizations build a service ecosystem around existing products and rapidly adapt production cycles to the market.

Study participants confirmed that by creating an equal intrinsic value to the product and the customer needs, the SME organizations could genuinely empathize with the customers and identify additional offerings to complement the customer experience. The study aligns with Argyris and Schoen (1978) and Senge (2006) that the believed

customer-centricity of the organization yields to other values, such as productivity or cost-savings. The study further aligns with Cousins's (2018a) and Elsbach and Stigliani's (2018) conclusion that deep customer engagement and experimental learning yield a competitive advantage. My study results extend knowledge on the works of Bjoerklund et al. (2020), Cousins, and Elsbach and Stigliani on how a design thinking business model yields a competitive advantage by developing deep empathy with the customer to grow a service ecosystem around products and to adapt production cycles to the market rapidly.

### **Embedding Design Thinking in a Manufacturing SME to Drive Competitive Advantage**

Scholars found that SME leaders struggle to elevate innovative design thinking processes strategically, placing these businesses at a disadvantage for long-term sustainability than their larger-sized competitors (e.g., Eide et al., 2021; Ferrara & Lecce, 2020; Lattemann et al., 2020). My study results confirmed that integrating design thinking into the organizational culture is effectively impeded by traditional cultures, existing mindsets, lack of internal knowledge, unwillingness to experiment, and the inability to diffuse communication into all layers of the organization.

Study participants confirmed that elevating design thinking requires that SME leaders enable complete and transparent diffusion of information into all internal subcultures, foster professional development, and encourage experimentation. The study aligns with the works of Bjoerklund et al. (2020), Carlgren et al. (2016), and Elsbach and Stigliani (2018) on that experimentation, organizational cultures, existing mindsets, and

design thinking knowledge determine how well SME leaders might be able to integrate design thinking into their organizations. My study results extend knowledge on the works of Bjoerklund et al. , Carlgren et al. , and Elsbach and Stigliani on how SME leaders can influence their organization culture by enforcing transparent communication flow across all levels regardless of underlying subcultures that may have developed their values and languages.

### **Limitations of the Study**

Limitations in case study research are imposed features the researcher has no control over and may impact the study results (Yin, 2017). The first limitation is the nature of the study because qualitative research cannot provide conclusions generalizable to a population group (see Merriam & Tsidell, 2015). Using the multiple case study instead of a single case study design helped strengthen the transferability of study results. These data sources included interviews, journaling/reflective field notes, and archival data, which strengthened the trustworthiness of the study's data by allowing for data and method triangulation (see Guion et al., 2011).

The second limitation is the chosen case study design concerning methodological rigor and consequent doubt about the study's reliability and validity (see Runfola et al., 2017). A comprehensive literature review further supported the study's findings and interpretations. The third and final limitation regards the interview process. Interviewees may not have engaged truthfully with me, and their responses might have been influenced by bias, nervousness, or concerns (see Merriam & Tisdell, 2015). The participants' social

context, including personal bias and anxiety, may impair the quality of the answers (Merriam & Grenier, 2019). Additionally, power differentials may arise between the researcher and participants during the interview process (Mero-Jaffe, 2011). I attempted to establish a bond of trust with the participants to manage this limitation (see Rubin & Rubin, 2005).

### **Recommendations**

While previous studies discussed design thinking, general challenges to innovation, and hurdles specific to design thinking in manufacturing SMEs, this study's findings confirmed existing research and further revealed fundamental components that enable SME leaders to integrate design thinking into their organizations successfully. The outcome of this study provides actionable steps on establishing found components and addressing common pitfalls of implementing design thinking into SMEs.

The results of my study provided practical insights from design thinking experts on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. While this qualitative multiple case study's intent was not to generalize the outcome across the entire SME population, the findings of what was learned and how I described what I learned may help SME leaders to implement design thinking in their firms successfully. The study's results confirmed and further expanded the conceptual framework and identified opportunities for future researchers.

### **Recommendations for Scholarly Research**

The research design chosen to complete this study can easily be used to conduct future, similar studies that focus on other industries within the SME sector or larger organizations that were not explored yet. Those study outcomes could further extend Bjoerklund et al.'s (2020) work to understand better the coevolution of deep expertise in design practices and a comprehensive understanding of design capabilities. Based on the views of the interviewed design thinking experts, integrating design thinking into SME organizations is vital for their survival and warrants further research that should be prioritized.

The participants' view on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy provided in-depth knowledge and crucial characteristics within organizations on topics that can drive future scholarly research. These topics include (a) leadership competencies for implementing a design strategy in SMEs, (b) leading a cross-functional team to adopt design thinking, sustaining design thinking within a cross-functional team, (c) developing a design thinking business model for sustainability, (d) embedding design thinking in a manufacturing SME to drive competitive advantage, and (e) gaining a competitive advantage with a design thinking business model.

Through quantitative analysis, future research could focus on developing a meaningful understanding of these attributes and how they impact design thinking integration efforts in manufacturing SMEs. Future researchers are encouraged to replicate

the findings of this study using quantitative approaches to validate these findings from similar or different contexts. A quantitative approach allows for a broader study of variables involving a more significant number of participants from other population groups. Using the manufacturing SME leader as the unit of analysis enhances the generalizability of findings and allows for greater objectivity and improved empirical accuracy. An example of such quantitative research could measure team effectiveness 6 months to a year after a design thinking strategy is launched within a small or medium-sized manufacturing firm using SEM (structural equation modeling). SEM is a multivariate statistical analysis technique used to analyze structural relationships. This technique combines factor analysis and multiple regression analysis, and it is used to analyze the structural relationship between measured variables and latent constructs (Harkiolakis, 2021).

Another opportunity for future research is related to the cultural change of organizations and how more traditional organizational cultures can integrate design thinking successfully. In this study, experts widely agreed that existing cultures resist the more radical and “fuzzy” nature of design thinking. The experts in this study also mentioned the need for effective distribution and diffusion of information across the organization and into all its layers to break down existing mindsets, which presents another opportunity for future research. Finally, underlying components such as communication, design thinking education, granting legitimacy, or including external

consultants in the context of design thinking efforts in manufacturing SMEs warrant the need for further research.

### **Recommendations for Practice**

At the time of this research, SME leaders had little guidance on successfully driving design-thinking processes within their firms as an innovation strategy to support business sustainability and competitive advantage while practically achieving buy-in from their non-design staff (Bjoerklund et al., 2020; Ferrara & Lecce, 2020). This study's outcome revealed six core attributes that enable SME leaders to integrate design thinking into their organization's strategy.

Design thinking experts agreed that SME leaders must hone their leadership competencies regarding design thinking and provide solid and continuous commitment. The ability to sustain value creation with design thinking requires SME leaders to grant legitimacy to design thinking as an innovation strategy enabling continual access to resources. SME leaders can establish legitimacy by being role models for change, uncertainty, and experimentation. Isolated siloes can “buy” into the idea of design thinking when SME leaders effectively distribute and diffuse information across the organization into all layers by adapting their language and metrics to each subculture. Developing a comprehensive understanding of design thinking with training, professional development, and continuous formal and informal communication breaks down initial resistance and initiates a cultural shift. Further, SME leaders can seek deep understanding

with support from external design thinking experts to manage the initially unintuitive design thinking process.

## **Implications**

### **Positive Social Change**

Academic scholars have documented the successful adoption of design thinking processes in large and multinational firms (Elsbach & Stigliani, 2018; Knight et al., 2020). Challenges in developing a design-driven organization remain for leaders of SMEs, who continue to be confronted by staffing challenges, time limitations, and budgetary constraints hindering their innovation activities (Magistretti et al., 2020; Wrigley et al., 2020). SME owners still struggle to develop the cross-functional collaboration needed among their employees to adopt design thinking processes effectively (Ferrara & Lecce, 2020).

The extant literature on the gap amongst these numerous streams of academic research and practice-based knowledge was founded on the lack of research of successful design-thinking processes within the manufacturing SMEs sector and led to a literature gap on how SME leaders can practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020). In this era, where small and medium-sized enterprises are continually under threat of extinction due to new challenges within the global economic market, the results of this study may drive positive social change by providing manufacturing SME leaders with a better understanding of how to successfully

drive design thinking to achieve business sustainability and competitive advantage (see Eide et al., 2021; Lattemann et al., 2020)

### **Implications for Policy and Professional Practice**

Scholars widely agreed that manufacturing SME owners still struggle to develop the cross-functional collaboration needed among their employees to adopt design thinking processes effectively (Ferrara & Lecce, 2020). Besides lack of cross-functional collaboration, poor resource allocation, constant conflict with other tasks, and lack of influence over top management team attention and decision-making strategy hinder SMEs from sustaining design thinking efforts in their firms (Micheli et al., 2018).

My study contributes to the field of management by confirming existing challenges and by providing SME leaders an improved understanding based on design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage (see Bjoerklund et al., 2020). This study confirmed design thinking-specific hurdles identified in the existing literature and revealed vital components in successfully implementing design thinking strategies in manufacturing SMEs.

This study informs business owners on integrating comprehensive design capabilities across their departments to drive cross-team collaboration in design-driven SMEs (see Bjoerklund et al., 2020; Ferrara & Lecce, 2020). My study's outcome identified six vital elements SME leaders must pay attention to and provided actionable

steps to grow and embed those components in their organizations. Based on the study's findings, I made recommendations that may offer the opportunity for continued research to further create knowledge in the area of design thinking strategies in the context of manufacturing SMEs. As SME leaders remain challenged by an increasingly turbulent environment, continuing research on my and similar works is essential.

### **Theoretical Implications**

The extensive literature review revealed a gap in academic research and practice-based knowledge on how SME leaders can successfully implement design thinking strategies and practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020). Strategy-as-practice scholars called for further empirical research to fill this literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020).

The findings of this empirical study using an explorative multiple case study design contributed original, empirical data to the study's conceptual framework of Bjoerklund et al.'s (2020) integrating design across the organization model on developing co-evolving design capabilities within project teams to further cross-team collaboration in the design-driven organization. The study's results stem from interviews with seven design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business

sustainability and competitive advantage and extend theory in the management literature with empirical results.

My study confirms the two concepts that ground the study: a) co-evolving design capabilities and b) the design-driven organization. The strength of these two concepts combined with the new knowledge gained in this study may frame SME leaders' actions to implement design thinking strategies successfully. SME leaders can enable their management and structures within their organizations to absorb a comprehensive and deep understanding of design thinking that will lead to successful design thinking integrations. The study's conceptual framework formed the contextual basis for exploring the needed skills, processes, and structures to successfully drive design thinking within SMEs as an innovation strategy to support business sustainability and competitive advantage. My study's outcome extends theory by identifying vital attributes in SMEs for successfully implementing design thinking strategies and actionable steps to establish those characteristics.

### **Conclusions**

As increasingly turbulent environments negatively impact the average lifespan of organizations, leaders must adopt innovative business models for the survival and relevance of their firms (Anthony et al., 2018; Shanker et al., 2017). While large organizations continue to implement design thinking, an approach that enables companies to persevere in chaotic environments, SME leaders struggle to adopt design thinking processes effectively (Cousins, 2018a; Ferrara & Lecce, 2020). The purpose of this

qualitative multiple case study was to describe design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage.

I used semistructured interviews with open-ended questions to gain in-depth insight from the study participants (see Yin, 2017). The created understanding from the yielded data allowed me to identify themes that answered the central research question and aligned with the two concepts that ground the study from Bjoerklund et al.'s (2020) integrating design across the organization model: a) co-evolving design capabilities and b) the design-driven organization. With this research, I sought to further research with original, empirical data and address a literature gap on how SME leaders can successfully implement and sustain design-thinking processes within the manufacturing sector (Ferrara & Lecce, 2020).

Strategy-as-practice scholars called for further empirical research to fill a literature gap on how manufacturing SME leaders can develop a design-driven business that is economically sustainable (Gusakov, 2020; Knight et al., 2020). In today's volatile global market, small and medium-sized enterprises are continually under threat of extinction due to new challenges within the global economic market. The results of my study aligned with the works of other scholars on how challenges of implementing design thinking in SMEs put their organization at risk to survive in today's chaotic environment and extended understanding of the study topic (see Bjoerklund et al., 2020; Cousins, 2018a; Elsbach & Stigliani, 2018). With this newly gained knowledge, SME leaders can

focus on the identified key components to implement design thinking strategies and follow actionable items to foster, establish, grow business sustainability and competitive advantage within their organization.

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## Appendix A: Recruitment Letter

Hello,

I am a doctoral student at Walden University, inviting you to participate in my research study.

The purpose of this study is to gain a deeper understanding of how manufacturing SME leaders may successfully drive design thinking within their firms as an innovation strategy to support business sustainability and competitive advantage.

The study is important as the findings may inform business owners on integrating comprehensive design capabilities across their departments to drive cross-team collaboration in design-driven SMEs. The results of such a study may drive positive social change by providing manufacturing SME leaders with a better understanding of how to successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage. I believe your experience would be a significant contribution to the study.

If you would be interested in being a part of this study, please review and return the signed consent form attached to this letter. If you would like to request additional information, you may reply to this email. Thank you in advance for your consideration.

Respectfully,

Jarno Manzke (Researcher)

Ph.D. Candidate – Walden University

## Appendix B: Interview Protocol

Participant No: \_\_\_\_\_

Gender: \_\_\_\_\_

Age \_\_\_\_\_

Nationality: \_\_\_\_\_

Years as an academic researcher in Design Thinking and Innovation \_\_\_\_\_

Years prior professional experience with Design Thinking and Innovation \_\_\_\_\_

**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.*

*Today, SMEs within the manufacturing sector are challenged to gain sustainability and competitive market advantage by their larger-sized competitors' rapid adoption of innovative business models. Leaders, engineers, and designers must cooperate to build cross-functional team collaboration to successfully embed the design-thinking process in manufacturing SMEs to enhance innovation. The extant literature on launching successful design-thinking processes within SMEs, especially those in the manufacturing sector, is rare, leading to a literature gap on how SME leaders can practically support design thinking buy-in from their non-design staff (Ferrara & Lecce, 2020; Roper et al., 2016). The purpose of this interview is to collect design thinking experts' views on how manufacturing SME leaders may successfully drive design thinking within their firm as*

*an innovation strategy to support business sustainability and competitive advantage. Before we get started and to ensure consistency among participants' interview responses, I would like to share with you the definitions of key terms you will hear within the interview questions as they are defined within this study.*

***Business sustainability.*** This term refers to managing and coordinating environmental, social, and financial demands and concerns to ensure business units' responsible, ethical, and ongoing success (Khurana et al., 2021).

***Competitive advantage.*** This term refers to an organization's differentiation from competitors that retain existing or create new customers (Morris, 2013).

***Cross-functional team.*** This term refers to an inter-departmental collaborative workgroup in organizations (Bjoerklund et al., 2020).

***Design thinking.*** This term refers to the approaches and methodologies "developed in the field of design for abductively creating nonroutine solutions to ill-defined problems, regardless of the domain of application. Most scholars connect the concept of design thinking to human or user-centered innovation, creative problem-solving, experimentation, and iteration (Bjoerklund et al., 2020)

***Manufacturing industry.*** This term refers to the branch of manufacture and trade based on the fabrication, processing, or preparation of products from raw materials and commodities. Physical transformation is assumed to be how manufacturing creates economic benefits (Levinson, 2017).

**SMEs.** This term refers to small to medium-sized businesses defined by the "Small Business Administration's Table of Size Standards." Depending on the subcategory (e.g., farm machinery, construction machinery), companies with between 500–1,000 employees are defined as small to medium-sized businesses (Small Business Administration, 2012).

***Are we ready to begin?***

1. What are the general challenges that arise while implementing a design strategy in a small and medium-sized enterprise?
2. How can designers successfully join an SME's cross-functional teams and act as influencers who champion design?
3. How can an SME business owner best address the internal communication challenges that may arise within a cross-functional team of managers, engineers, and designers to adopt a design thinking strategy?
4. How might the feedback from design thinking experimentation best be communicated throughout a cross-functional team to facilitate the generation of innovation?
5. How can implementing a design thinking strategy support a manufacturing SME in gaining a competitive advantage within their market?
6. How can the implementation of design thinking support a manufacturing SME in building long-term business sustainability?

7. Are there any final thoughts you may want to offer SME leaders on how to successfully drive design thinking within their firm as an innovation strategy to support business sustainability and competitive advantage?

**Debrief:**

*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 you to review the summary to confirm 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 at any point if you have any questions.*