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Technology Manufacturing Organizations' Strategies for Achieving Sustainability

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This is to certify that the doctoral study by

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Walden University
2025

Abstract

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Abstract

Sustainability remains a challenge for technology manufacturers struggling to integrate environmental priorities into core operations. This issue is critical for technology manufacturing managers who must embed sustainability into organizational systems and decision-making processes to meet rising expectations from regulators, investors, and consumers. Grounded in transformational leadership theory, the purpose of this qualitative pragmatic inquiry study is to identify and explore effective strategies used by technology manufacturing managers in the western region of the United States. The data collected from seven semistructured interviews were analyzed using thematic analysis. The five themes that emerged were (a) leadership and company culture, (b) collaboration, inclusion, and diversity for innovation, (c) framing sustainability as business success, (d) community, ethical responsibility, and justice, and (e) stakeholder engagement and overcoming resistance. A primary recommendation for technology manufacturing managers is to expand investment in green training for internal stakeholders and multi-organizational collaboration among external stakeholders. The implications for positive social change include the potential for business leaders to promote sustainable practices that reduce unequal economic opportunity distribution and drive transformational change to improve the quality of life locally and globally.

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Dedication

I dedicate this study to the countless individuals working relentlessly to build a more sustainable future. While this research represents a modest contribution to the larger movement for environmental and social responsibility, I am deeply inspired by those whose daily actions drive meaningful and lasting change.

Acknowledgments

My deepest gratitude is extended to Dr. Dooley, my distinguished mentor, whose exceptional guidance, unwavering support, and scholarly expertise were instrumental in completing this research study. Sincere appreciation is also extended to the faculty and supporters of the doctoral program at Walden University for their contributions to academic development and for providing the foundation upon which this research was built. Profound thanks are given to the study participants, whose generous commitment of time and willingness to share their lived experiences made this research possible. Special recognition is also given to family and friends for enduring encouragement, patience, and belief throughout the research journey. Their support served as a constant source of strength and inspiration.

Table of Contents

List of Tables

Section 1: Foundation of the Project

Technology manufacturing managers can use organizational sustainability for the betterment of their company; however, some technology manufacturing managers lack leadership strategies to achieve and manage organizational sustainability. Therefore, the purpose of this qualitative pragmatic inquiry study was to identify and explore effective strategies used by technology manufacturing managers from small to medium enterprises (SMEs) to achieve and manage organizational sustainability.

Background of the Problem

Technology manufacturing enterprises are at the forefront of a rapidly changing world. There are many complex and compounding problems that, if left unaddressed, will permanently degrade the environment and quality of life globally (Jamwal et al., 2020). Technology manufacturing managers often struggle to devise plans that account for externalities and stakeholders as they adapt from profit-driven to solidarity-focused strategies that prioritize responsible business practices for maximizing value practices (Allal-Chérif et al., 2023; Enyoghasi & Badurdeen, 2021; Khanfar et al., 2021). Business managers are operating in a new paradigm, with a new status quo where the inclusion of leadership strategies for organizational sustainability is required. The general business problem is that some technology manufacturing managers encounter challenges when facing a global market increasingly driven by sustainable practices that require integration of organizational sustainability.

Business Problem Focus and Project Purpose

The specific business problem is that some technology manufacturing managers lack leadership strategies to achieve and manage organizational sustainability. Therefore, the purpose of this qualitative pragmatic inquiry study was to explore leadership strategies used by technology manufacturing managers from SMEs to achieve and manage organizational sustainability.

The targeted population consisted of managers of SME technology manufacturers in the Western region of the United States who have implemented organizational sustainability. Many technology manufacturer managers have years of experience building sustainability efforts with diverse approaches (Haleem et al., 2023; Miao & Zhao, 2023). I used a purposive sampling method with specific criteria for sample inclusion to collect the sample population. To select the sample population, I contacted seven potential participants through publicly available social networks. To collect the data, I used remote, semistructured interviews that were audio-recorded only. Bass's (1985, 1990) transformational leadership theory was the conceptual framework for this study.

Research Question

What are the leadership strategies technology manufacturing managers use to achieve and manage organizational sustainability?

Assumptions and Limitations

Assumptions

It is essential for researchers to be mindful of their assumptions. Assumptions are implicit and foundational beliefs accepted as accurate without fact and can impact the rigor of the researcher's findings (Cheron et al., 2022; Sebele-Mpofu, 2020). In this study, I assumed that participants had experience with and knowledge about leadership strategies for achieving and managing organizational sustainability. I also assumed that participants understood my interview questions and answered honestly, authentically, and conscientiously. To address these assumptions, I used the successful implementation of organizational sustainability as the criterion for selecting my purposive sampling. I also communicated that the identity of the interviewee will remain anonymous.

Limitations

Researchers need to be aware of limitations. Limitations in research are potential constraints and barriers that may impact the researcher’s findings (Bergen & Labonté, 2020; Haynes & Loblay, 2024). In this study, I was limited by the scope and availability of the sample population, as well as by participants potentially providing biased or untruthful information. To address these limitations, I selected participants from a region with many small- to medium-sized technology manufacturers with successful organizational sustainability. I also ensured anonymity for the participants and showed trustworthiness as an interviewer, so participants were more likely to communicate challenges or failures.

Transition

In this study, I explored leadership strategies that technology manufacturing managers use to achieve and manage organizational sustainability. In Section 1, I included the background of the problem, the business problem focus and project purpose, the research question, and the assumptions and limitations. In Section 2, I review the professional and academic literature about transformational leadership and organizational sustainability. In Section 3, I include the project ethics, the nature of the project, data collection and analysis activities, and reliability and validity. In Section 4, I discuss the findings and the implications for business practice, social, and further research.

Section 2: The Literature Review

A Review of the Professional and Academic Literature

A review of the professional and academic literature is a key element of this study. Literature and research reviews are in-depth, current, and comprehensive analyses of a body of knowledge (Dodgson, 2023). Researchers should include research synthesis and critical analysis of their research topic in their literature reviews (Dodgson, 2021). In this literature review, I explore, critique, and synthesize the body of knowledge for transformational leadership and organizational sustainability. First, I address the conceptual framework and how it relates to the organizational sustainability of technology manufacturers. Then, I analyze, synthesize, critique, and compare the concepts related to this study's purpose: to explore leadership strategies used by technology manufacturing managers from SMEs to achieve and manage organizational sustainability.

I first explore the conceptual framework of transformational leadership theory. Transformational leadership theory has roots in historical change-makers who established rapport with followers to drive social transformation (Burns, 2003). Both Burns (1978) and Bass (1985, 1990) emphasized that effective transformational leadership relies on four core elements: inspirational motivation, idealized influence, individual consideration, and intellectual stimulation. Transformational leaders identify changes, create a vision grounded in purpose and values, and ensure lasting impact through employee commitment.

In addition, I explore the connections between transformational leadership and the organizational sustainability of technology manufacturers. Transformational leadership is pivotal in driving substantial, enduring changes for organizational sustainability, especially in the rapidly evolving technology manufacturing sector (Ha & Moon, 2023; Redman & Wiek, 2021). Transformational leadership drives changes for sustainability in the technology manufacturing sector and is supported and contrasted by many other theories.

To complete my review of transformational leadership, I explore the contrasting and supporting leadership theories of sustainable leadership, change management, and transactional leadership. Sustainable leadership and change management tangentially align with transformational leadership because they share core traits and focus on change through values (Armani et al., 2020; Davis, 2022). Transactional leaders are skilled motivators; however, transformational leadership is more effective at catalyzing change and innovation (Abbas & Ali, 2023; Aleksandrovna Zhuravleva & Poliak, 2022). In addition to supporting and contrasting leadership theories, organizational sustainability concepts for technology manufacturers are also key.

I also explore vital concepts associated with organizational sustainability for technology manufacturers, including the United Nations (UN) Sustainable Development Goals (SDGs), Industry 4.0, life cycle management, the triple bottom line approach, environmental, social, and governance (ESG), and corporate social responsibility (CSR). The technology manufacturing industry faces pressure from consumers, government, and competition, leading to required transformations in operations, designs, processes, and

values (Bag & Pretorius, 2020; Cai & Choi, 2020; Jasiulewicz-Kaczmarek et al., 2023). Technology manufacturers' organizational sustainability strategies equip managers with tools to reduce environmental impacts and boost competitive advantage.

The approach to my literature review included keyword searches using phrases such as *sustainability, transformational leadership, sustainable business strategies, organizational sustainability, stakeholder engagement, green business,* and *corporate sustainability.* I used the Thoreau Multi-Database Search tool to access journals, including Business Source Complete, Emerald Insight, SAGE Journals, ScienceDirect, ProQuest Central, and EBSCOHost. I also supplemented my search using Google Scholar to find articles in other journals and access them through the Walden University Library. I looked up the journals I used in my research in Ulrich's Periodical Directory to ensure that I used articles from peer-reviewed journals. The majority of the sources I used, 91%, were sourced from peer-reviewed journals. In addition, 88% of the articles I used have been published within 5 years of the publication of this study.

Conceptual Framework

Transformational leaders are change-makers who influence and inspire positive change in their followers. The transformational leadership theory has been developed as a leadership style that involves inspiring drive, ideological influence, intellectual stimulation, and individualized attention to motivate followers (Bass, 1985, 1990; Bass & Riggio, 2006). Transformational leaders effectively implement social change by creating intrinsic motivation in followers, transforming worldviews with appealing visions and values, and fostering environments conducive to innovation and problem-solving (Burns,

2003). In practice, transformational business leaders can identify needed change, create a vision that speaks to a meaningful purpose and values, and ensure the changes endure with employee commitment.

Transformational leadership theory emerged from historical leaders who drove significant change. Burns, a behavioral scientist, identified that transformational changes require a rapport between leaders and followers, where leaders can be catalysts for social change among many followers (1978). Bass, an organizational behavioral scientist, also developed transformational leadership theory, defining the theory with the organizational leadership components of inspirational motivation, idealized influence, individual consideration, and intellectual stimulation (Bass, 1985; 1990). Transformational leadership theory is effective at initiating change, onboarding followers, increasing commitment to the change, and imparting values that instill change over time.

Transformational Leadership and Organizational Sustainability

Authors have expanded on transformational leadership to include and rely on sustainability values and purposes. Business leaders can use transformational leadership qualities to convey the company's sustainable goals and shift core values and purpose to create new sources of growth (Redman & Wiek, 2021). Rooted in change-making, transformational leadership effectively allows managers to lead and manage organizational sustainability (Alshihabat & Atan, 2020). Leaders can use strategies to manage sustainable transformational changes effectively, including the transformational leadership qualities of visioning, goal setting, collaboration, inclusion, and engagement

(Axon, 2020; Huang et al., 2021). Transformational leadership is essential for business leaders to address the complex impacts of climate change and social issues.

Organizational sustainability initiatives require transformational leadership for achieving change. Incremental change is inadequate to respond to rapid shifts and acceleration toward system tipping points (Nosratabadi et al., 2019). For example, a response to a sustainability issue like climate change requires major changes that transform organizations and operations. In addition, sustainability transformations require changes that unsettle the status quo and force people to question their and their organizations' fundamental ethical values (Horcea-Milcu et al., 2019). Sustainability efforts focusing on justice in communities and inclusive networks require transformations (Stocker et al., 2022). Transformational leadership is used by leaders to address climate change, social inequity, and better innovative market-based problem-solving.

Societal shifts drive market trends for improved organizational sustainability. The Industry 4.0 revolution has increased the pressure on organizations to seek transformational change to address complex environmental and social challenges (Novita et al., 2022). Radical green creativity is required to achieve sustainable operations (Al-Ghazali et al., 2022). Transitions to sustainable business models require transformational changes instead of incremental ones because of the holistic approach required and the impact of interconnected global systems (Nosratabadi et al., 2019). Business leaders face increasing pressures and incentives to embrace transformational changes for sustainability.

Transformational changes for sustainability are organizational pivots that deeply impact and endure changes. Transformational change requires a significant, lasting change in direction and leaders acting as change agents (Redman & Wiek, 2021). Sustainability transformations must be incorporated into company culture with leadership's commitment, resource investment, and stakeholder alignment (Mio et al., 2021). Due to their success, transformational sustainability changes have become a top trend over the last century.

In addition to achieving sustainability goals, transformational leadership qualities can be utilized to innovate, adapt to new market trends, and address challenges. Sustainability transformations in business can lead to economic development and competitiveness, marketability, reduced risk, innovation, social cohesion, and community development (de Freitas Netto et al., 2020; Shahzad et al., 2022). Organizations face unprecedented competition and challenges in the environmental and social systems they operate within that require transformational changes by transformational leaders.

Transformational leadership plays a crucial role in advancing sustainable business practices. When used to advance sustainable business, transformational leadership can lead to long-term profitability and value creation, positively affecting firms' social and environmental organizational performance (Aleksandrovna Zhuravleva & Poliak, 2022; Kafetzopoulos & Gotzamani, 2022; Novita et al., 2022). Furthermore, authors have also found that transformational leadership is central to an organization's ability to address sustainability challenges (Piwowar-Sulej & Iqbal, 2022; Shahzad et al., 2022).

Transformational leaders have a tailored skill set that is highly effective in organizations striving to be more sustainable.

Inspirational Motivation

Transformational leaders inspire motivation through change identification, visioning, shared values, and follower support. Organizational change requires a catalyst, vision, and motivating commitment from followers. Transformational leaders can reach the hearts and minds of followers to spark intrinsic motivation and strong commitment levels to change (Jun & Lee, 2023; Peng et al., 2020). Transformational leaders inspire motivation through trust, loyalty, a sense of ownership, self-efficacy, innovative work environments, and positive morale (Nguon, 2022; Shang, 2023). Followers of transformational leaders have better task performance and actively search for continuous improvement opportunities to increase organizational performance (Shang, 2023). In this way, transformational leaders catalyze cultural change.

The sustainability revolution has caused business leaders to question traditional ethical values, causing a worldwide paradigm shift in the business environment. Sustainable strategies transform business values, and leaders must motivate employees with inspirational sustainability values (Armani et al., 2020). Transformational leaders can inspire followers to work towards a common sustainability goal with self-efficacy and intrinsic motivation (Ha & Moon, 2023). Value alignment is critical for embedded, lasting change.

Followers who share the change vision in sustainable business can also share the values associated with sustainable changes. Transformational leaders can empower

followers to promote environmentally friendly and socially responsible practices that align with organizational shared values (Tian et al., 2023). Each organizational stakeholder can initiate change and continuously engage in practices that support the change's vision, shared values, and purpose (McKim & Goodwin, 2021). Shared values, such as the status quo needs to be more balanced, are essential for building a culture of cohesion and employee action toward sustainability goals (Kantabutra & Ketprapakorn, 2020). Transformational leaders focus on inspiring shared values and empowering followers to act using those values.

Sustainability efforts in business require visioning, values with purpose, and motivation for collective change-making. Transformational leaders focused on sustainability disrupt the status quo and catalyze change through transform missions, visions, and shared values to align with sustainable development goals (Crucke et al., 2022; Dorninger et al., 2020; Horcea-Milcu et al., 2019; Stocker et al., 2022). In addition to motivating followers with inspirational motivation, transformational leaders can showcase sustainability values to motivate with idealized influence.

Idealized Influence

Transformational leaders use idealized influence to reach followers personally and morally while inspiring motivation through expressing shared values and commitment to changing behaviors and worldviews. Idealized influence in transformational leaders can increase empathy and reciprocity between leaders and followers, encouraging followers to change their ideals, interests, and values to align with the leader and organization (Cahyadi et al., 2023; Ha & Moon, 2023; Huang et al., 2021).

Transformational leaders can influence organizational citizenship behaviors by increasing job satisfaction, employee empowerment and commitment, and organizational performance (Gil-Barragan et al., 2023; Saad Alessa, 2021; Shang, 2023). Idealized influence from transformational leaders inspires purpose and values that form the basis of change motivations within organizations.

Sustainable transformational leadership can motivate followers to reach organizational sustainability goals by living by values and ethical considerations of the current sustainability movement and Industry 4.0. Transformational leaders focused on sustainability demonstrate green and socially responsible behaviors by sharing knowledge and discussing issues, which significantly impacts organizational identity, increases advocacy, encourages innovative thinking, and deepens work engagement and commitment (Al-Ghazali et al., 2022; Cop et al., 2020; Crucke et al., 2022; Mansoor et al., 2021). Leaders who both inspire and motivate can push followers to achieve both collective and individual goals (Gil-Barragan et al., 2023; Redman & Wiek, 2021). In sustainability, transformational leaders lead by example, inspiring and motivating followers towards goals with ideal values and individual consideration.

Individual Consideration

Transformational leaders support and empower followers with individual consideration. Leaders with active involvement with followers can increase employee motivation and work performance through higher self-efficacy, efficiency, job satisfaction, and employee engagement (Gan & Voon, 2021; Shang, 2023). Another outcome of transformational leadership individual consideration is increased innovation,

stimulated by transformational leaders through individualized and organizational support and personal approaches that increase employee capabilities and encourage creativity (Ayaz, 2022; Jun & Lee, 2023). Followers receive the benefits of increased capabilities, empowerment, and support, and organizations receive the benefits of improved employee work performance.

Individual consideration for employee followers of transformational leaders in the context of sustainability means support through changes and direction for accountability. This can include engagement with and advocacy of environmental and social responsibility and resiliency (Cop et al., 2020; Crucke et al., 2022; Huang et al., 2021; Tosun et al., 2022). Sustainable, transformative leaders empower followers to increase organizational learning and collaborative engagement (Armani et al., 2020; Begum et al., 2020). Employee resiliency and engagement with sustainability can be improved by transformational leadership, allowing followers to reach organizational sustainability goals while simultaneously boosting performance, creativity, and ingenuity (Özgül & Zehir, 2023; Srivastava et al., 2020). When motivating sustainable changes, leaders must provide individualized consideration for employees and empower individuals towards growth and intellectual stimulation.

Intellectual Stimulation

Transformational leaders use intellectual stimulation to engage followers and build capacities for enacting the change envisioned. Knowledge management, workforce training, and innovative work environments can increase followers' problem-solving ability and help them work through conflicts and change challenges (Gan & Voon, 2021).

Transformational leaders use intellectual stimulation to continuously improve followers' capabilities and organizational performance through innovation, creativity, and employee engagement (Mansoor et al., 2021; Nguon, 2022; Saad Alessa, 2021). The increased capabilities of the followers of transformational leaders can benefit organizations with increased innovation, adaptation, problem-solving, organizational learning, and resiliency (Mohamed & Otman, 2021; Tian et al., 2023). With an increased understanding and knowledge, followers can transform their worldviews and share the values that drive meaning for the implemented change.

Sustainability strategies require an increased understanding of complex and interconnected systems and the impact of action initiated from shared values. Sustainable, transformative leaders empower followers and improve organizational learning (Begum et al., 2020). Leaders must also understand relationships in the greater systems that organizations exist within and how their organization impacts those relationships to identify and leverage the transformational changes needed (McKim & Goodwin, 2021). Effective sustainability strategies require leadership that spearheads positive change, engages stakeholders, and builds organizational psychological and intellectual capital (Al-Ghazali et al., 2022; Cop et al., 2020; Redman & Wiek, 2021; Tian et al., 2023). Transformational leaders use intellectual stimulation to motivate followers and increase their understanding of the reasons for the changes needed.

Transformational leaders foster the expansion of sustainability awareness. Investment in training is needed to reach sustainability change goals through innovation, creativity, knowledge sharing, and problem-solving (Begum et al., 2021; Novita et al.,

2022; Shahzad et al., 2022). This training includes formal and informal on-the-job training, facilitation of idea-sharing between employees, and employee inclusion in problem-solving (Novita et al., 2022; Sathasivam et al., 2021; Wasieleski et al., 2021). Sustainability efforts in business require knowledge sharing, and transformative leaders focused on sustainability empower followers to continuously improve, gain knowledge, and function as a learning organization.

Contrasting and Supporting Leadership Theories

Sustainable Leadership. Sustainable leadership styles tangentially align with transformational leadership. These leadership styles align because they are effective for organizational sustainability and share core traits with transformational leadership (Armani et al., 2020). Sustainability management and leadership attributes include sustainability knowledge, orientation toward change, optimization, regulatory compliance, stakeholder inclusion, long-term and systems thinking, and alignment with cultural values, ethics, and vision (Redman & Wiek, 2021; Singh et al., 2020). For example, sustainable leadership traits encompass inclusion, trust, psychological empowerment, interdisciplinary knowledge, understanding of global challenges and dilemmas, organizational context, long-term-thinking, systems thinking, and inspiration through shared values (Leal Filho et al., 2020; Muff et al., 2020; Tripathi et al., 2020). Perpetuating organizations into the future requires both sustainability leadership and values.

Sustainable leadership is an integral part of organizational sustainability. In part because sustainable leadership allows for organizational learning, knowledge sharing,

innovation, psychological empowerment and safety, inclusion, openness, trust, and shared values, and organizational learning (Iqbal & Ahmad, 2020; Iqbal et al., 2020; Tripathi et al., 2020). Organizational change efforts for sustainability depend on the ability of leadership to gain stakeholder buy-in using shared values (Kantabutra & Ketprapakorn, 2020; Peng et al., 2020). Each organizational stakeholder can initiate change and continuously engage in practices that support the change's vision, shared values, and purpose (McKim & Goodwin, 2021). Sustainable leaders in business foster values that facilitate organizational sustainability.

Values are fundamental to sustainability efforts. Shared values are important for building a culture of cohesion and employee action toward sustainability goals (Kantabutra & Ketprapakorn, 2020). Sustainability leaders must also understand relationships in the larger systems that organizations exist within and how their organization impacts those relationships (McKim & Goodwin, 2021). Sustainable leadership is essential for creating an environment where followers can pursue sustainability.

Change Management. Sustainable business strategies require businesses to transform practices and motivate many followers toward new goals, visions, and values. Many theories can be used to define change management. From Lewin's (1947) change model to the more modern 8-step change model by Kotter (1996), change management has been used for decades to implement successful organizational change. Lewin's (1947) three-step model of unfreezing, changing, and refreezing are change management steps criticized as overly simple, yet researchers have found these steps are elegantly

ingenious (Burnes, 2020). This model set the stage for modern change management and is the backbone of many successful change efforts.

Kotter's change model is also central to successful change initiatives in today's business world. Kotter's (1996) 8-step model can guide change makers through creating an environment for change, implementing change, and sustaining the change (Davis, 2022). The steps of Kotter's change model are to (a) create urgency, (b) put a team together, (c) develop vision and strategies, (d) communicate the change vision, (e) remove obstacles, (f) set short-term goals, (g) keep the momentum, (h) make change stick (Kotter, 1996). With change management, there are many opportunities to respond to pressures and trends with innovative changes.

Change management has been developed to increase the success of change initiatives required to gain and maintain marketability and competitive advantage. Companies are pressured to change to avoid negative impacts and gain a competitive advantage; however, many changes often fail because stakeholders lack preparation and support (Cai & Choi, 2020; Sittrop & Crosthwaite, 2021). Business leaders use change management models to prepare for change, gain stakeholder buy-in, and respond to evolving trends in the global market.

Transactional Leadership. Transformational and transactional leadership styles can be considered opposite approaches to leading. Transactional leadership theory contrasts with transformational leadership theory; however, both focus on influencing the productivity and performance of followers. Transactional leaders focus on motivating followers to perform better through extrinsic accountability, incentives, and penalties

(Deshwal & Ashraf Ali, 2020). Focused more on the exchange between leaders and followers, transactional leaders set goals and motivate employees to reach those goals with incentives and recognition.

Leaders can use transactional leadership to motivate employees. However, it is less effective than transformational leadership (Aleksandrovna Zhuravleva & Poliak, 2022). Transformational leadership was more effective than transactional leadership in change implementation projects and entrepreneurial opportunity seeking (Abbas & Ali, 2023). Transactional leadership motivates, but transformational leadership drives change and effectively fosters innovation.

Key Concepts: Organizational Sustainability for Technology Manufacturers

The manufacturing sector is highly influential, and the decisions made by its leaders can have global consequences. This industry faces pressure from consumers, government, and competition, creating challenges and regulations requiring transformations of operations, designs, processes, and values (Bag & Pretorius, 2020; Cai & Choi, 2020; Jasiulewicz-Kaczmarek et al., 2023). Beyond the manufacturing sector's challenges and regulations, organizations can gain a competitive advantage when embracing sustainable technology manufacturing.

Technology manufacturing enterprises' sustainability strategies reduce environmental impacts and create a competitive edge by meeting consumer demand for sustainable resources. Technology manufacturers ' sustainability strategies create an innovative, competitive advantage by mitigating adverse effects on the environment and stakeholders (Cop et al., 2020). Competitive advantage stems from the consumer demand

of Industry 4.0 for the reduction in the use of nonrenewable material, energy, and resource input, and emissions from production, as well as a change in consumption patterns for reduced product end-of-life product disposal (Bag & Pretorius, 2020; Ghobakhloo et al., 2021). Resource use and consumption patterns are major sustainability challenges in technology manufacturing.

Some of the most material sustainability challenges in the technology manufacturing sector are the impacts of technology's production, use, and disposal. For example, material consumption, waste, emissions, energy use, treatment of workers, and treatment of communities involved are all critical to technology manufacturers striving to improve sustainability (Bastas, 2021; Richnák & Fidlerová, 2022). Trends associated with Industry 4.0 require technology manufacturers to embrace the cutting edge. Technology is used in sustainable manufacturing and practice business that contributes to achieving sustainable development goals (Ng et al., 2022). Technology manufacturing enterprises face significant sustainability challenges that require practices that address social inequities and environmental challenges.

United Nations Sustainable Development Goals

The idea of sustainability in business can be described in many ways; however, global society has broadly accepted the UN and its SDGs as an authority on describing sustainability's complex and interconnected concepts. Sustainable development began as a well-defined subject from the Brundtland Report to meet today's needs while ensuring future generations can meet them (Hueting, 1990). In the decades since, it has grown to be defined through the UN SDGs, which advanced the need for a clear definition of

sustainable transformational change (Pizzi et al., 2020). The UN SDGs are now a global standard of sustainability.

The UN SDGs are expansive and thorough, covering topics from poverty and fundamental human rights to water quality, ocean health, renewable energy, and safe cities. The 17 UN SDGs have the categories of (a) education, gender, and inequality; (b) health, well-being, and demography; (c) energy decarbonization and sustainable industry; (d) sustainable food, land, water, and oceans, (e) sustainable cities and communities, and (f) digital revolution for sustainable development (Pizzi et al., 2020; Sachs et al., 2019). As a global organization, these goals have high-level indicators that can be used to steer business towards advancing holistic sustainability.

SDG Challenges. The UN SDGs have set a clear direction for what sustainability entails, though the goals remain ambitious and are high-level strategies that business leaders may not effectively implement actions towards. The SDGs have been successfully used in many transformational change contexts; however, sustainable development goals have not been used consistently due to the high-level strategy of these goals (Cai & Choi, 2020; Jamwal et al., 2021). For example, major inconsistencies have been found in companies' progress toward addressing the United Nations' SDGs as corporations focus on renewable energy, infrastructure, and climate change adaptation rather than protecting human rights and eliminating corruption (Tsalis et al., 2020). All sustainability goals must be pursued to ensure equity and social justice.

In addition, there is an imbalance in the equitable progress of these goals in the global south. For example, without investment from developed nations, countries still

developing are experiencing a technology gap in their manufacturing sector (Yadav & Mankavil Kovil Veettil, 2022). To close this gap and equitably advance towards sustainability, manufacturers need rapid upscaling of technological and capacity-building advancements (Jamwal et al., 2021; Wang et al., 2023). Despite the clarity of the UN's SDGs, there is a disparity in their implementation by business leaders, necessitating a more nuanced approach to ensure equitable and consistent progress across all goals.

Business leaders are critical in achieving SDGs by embracing transformational changes that promote green economies and sustainable industrialization through innovative technologies. Achieving sustainable development goals through business requires transformational change for global green economies (Ng et al., 2021; Stocker et al., 2022). UN SDG 17, sustainable industrialization through promoting new technologies, has been used to develop strategies for the manufacturing sector (Bastas, 2021; Chang et al., 2021). International SDGs demand deep transformations throughout every country with actions by governments, civil society, the sciences, and businesses and call for the responsibility of firms to span beyond organizational boundaries (Ranjbari et al., 2021; Sachs et al., 2019; Schaltegger et al., 2022). The effectiveness of sustainable development goals can be debated, but the impacts of sustainability changes remain beneficial.

Industry 4.0

From the first industrial revolution to the third, manufacturing and technology manufacturing included mechanization, robotics, and mass production. The fourth industrial revolution marks a significant shift in manufacturing, leveraging digital

technologies to enhance sustainability and efficiency in business practices (Feroz et al., 2021; Ng et al., 2022). In Industry 4.0, technology manufacturing leaders can use digitalization through the Internet of Things, cloud, computing, big data, analytics, smart technologies, artificial intelligence, and virtualization (Bag et al., 2021; Titmarsh et al., 2020). Technological advancements enhance sustainability through better transparency, accountability, real-time sharing, and security (Khanfar et al., 2021; Qureshi et al., 2023). Cost-effective, efficient, and innovative manufacturing using advanced sustainable practices improves environmental and social impacts (Margherita & Braccini, 2020; Prasad et al., 2022; Xia et al., 2023). Industry 4.0 signifies a shift from traditional manufacturing to a future where digitalization enhances sustainability and efficiency.

Digitalization is a key element of Industry 4.0. Digitalization is a sustainability driver that business managers can use to balance their economic, social, and environmental interests (Chang et al., 2021; Gomez-Trujillo & Gonzalez-Perez, 2021; Chen et al., 2020). For example, programs that run mathematical modeling, simulations, and hybrid modeling have been used to increase the sustainability and resiliency of supply chains (Wofuru-Nyenke et al., 2022). Other major trends of Industry 4.0 include acknowledging limits to growth and the need for innovations.

Business managers in manufacturing compel innovations. Part of I 4.0, sustainable innovation refers to a company's ability to adapt processes for more innovative products and operate effectively in a socially and environmentally responsible manner (Calvo et al., 2023; Debnath et al., 2023; Ghobakhloo et al., 2021; Margherita & Braccini, 2020; Titmarsh et al., 2020). For example, additive manufacturing techniques

have been found to minimize waste, reduce carbon footprints, and decrease production time and costs by using less material when the life cycle analysis is compared to subtractive manufacturing (Abubakr et al., 2020; Reis et al., 2023). Integrating Industry 4.0 technologies into manufacturing is a transformative approach that enhances operational efficiency and significantly contributes to sustainability.

The International Organization for Standardization's (ISO) 14000 series, specifically ISO 14040 and ISO 14044, are procedures for lifecycle assessments, which are pivotal for environmental management. Integrating themes such as renewable energy, biodegradable materials, and end-of-life design aligns with these standards to encourage sustainable practices (Ahmad et al., 2022; Chyr & DeSimone, 2023; Wang et al., 2023; Zhang et al., 2023). Consequently, the confluence of Industry 4.0 technologies with ISO environmental standards represents a strategic alignment that holds the potential to revolutionize manufacturing towards greater sustainability and ecological responsibility.

Life Cycle Management. Life cycle management is pivotal to strategic decision-making for long-term gains and contributions to global sustainability objectives. Life cycle management guides manufacturers to identify risk factors and opportunities at each stage of a product's lifecycle (Jasiulewicz-Kaczmarek et al., 2023). The strategic decision-making related to assets is central to life cycle management, suggesting that organizations can reap long-term benefits by integrating sustainable development goals into their business models (Titmarsh et al., 2020). Therefore, by placing life cycle management at the heart of strategic planning, manufacturing enterprises secure enduring

benefits and actively participate in the global movement toward a more sustainable future.

Triple Bottom Line Approach

The Triple Bottom Line (TBL) approach is used in business to incorporate social and environmental aspects alongside the typical economic bottom line. Business leaders widely use the TBL to guide companies to achieve sustainability (Solovida & Latan, 2021). In 1994, John Elkington published the triple bottom approach, which has been accepted as synonymous with sustainable business (Bastas, 2021; Zaharia & Zaharia, 2021). The TBL approach is flexible and adaptive and can operationalize organizational sustainability (Yadav & Mankavil Kovil Veettil, 2022). Implementing the TBL approach involves materiality weighting, indicator measurement, and equal consideration of economic, social, and environmental categories (Ahmad et al., 2022; Dijkstra-Silva et al., 2022; Tseng et al., 2020). Through potential criticism, the TBL approach remains very popular and credible as a sustainable business practice.

Economic Bottom Line. The TBL approach reframes traditional corporate performance metrics by incorporating economic resilience, stakeholder focus, and long-term profitability. Emphasizing sustainable profits rather than short-term gains, the economic aspect of this approach underlines the importance of manufacturing capabilities as a significant contributor to organizational performance, global GDP, and societal success (Bastas, 2021; Malek & Desai, 2020). Integrating social and environmental factors into manufacturing maximizes production value and enhances competitive advantage (Debnath et al., 2023; Jayawardane et al., 2023). Additionally, enlightened

interests can be found within the interconnected environmental, social, and economic systems, such as when manufacturing operations can reduce environmental footprints and the cost of production through optimization of systems (Xia et al., 2023). Using TBL in manufacturing boosts economic growth, improves production efficiency, and strengthens competitive positioning by addressing social and environmental issues.

Social Bottom Line. The social bottom line represents a commitment to a socially responsible history and future, emphasizing fair labor practices, community development, human rights, and broader societal impacts. It challenges the industry to consider the ethical dimensions of its operations, particularly the treatment of workers and communities while responding to social change and consumer trends (Jayawardane et al., 2023). This approach stresses acknowledging and addressing community priorities, especially along supply lines and external stakeholder environments (Geldres-Weiss et al., 2021). For technology manufacturers, this translates into adopting a variety of strategies and tools to effectively implement and manage corporate social performance, thereby ensuring a positive impact on society (Abubakr et al., 2020; Ma et al., 2023). The social bottom line is an essential aspect of corporate strategy, compelling technology manufacturers to proactively foster societal well-being and ethical practices across their operations and communities.

Environmental Bottom Line. The environmental bottom line in manufacturing accounts for impacts on environmental systems. The environmental dimension of the Triple Bottom Line is concerned with adapting to environmental changes, complying with legislation, curtailing resource use, and fostering eco-innovations to mitigate the

ecological footprint of manufacturing activities (Gu et al., 2020). Environmental performance in manufacturing is gauged using metrics such as energy and water savings, waste reduction, and greenhouse gas emissions, focusing on sustainable sourcing and waste management for a circular economy (Abubakr et al., 2020; Zhang et al., 2023). Environmental impact assessments guide manufacturers in improving production and supply chains to serve people and the planet better (Khan et al., 2021). The environmental bottom line guides manufacturing, promoting sustainable practices that respect ecological limits and foster innovation and compliance.

Environmental, Social, and Governance

ESG is a term that holds broad use and interpretation in modern business and has gained traction as a business concept in recent years. The application of ESG differs among companies, involving investment strategy, risk management, corporate sustainability, and ideology. (Colorado et al., 2020; Huang, 2021; Malek & Desai, 2020). Institutional investors' growing market share has propelled ESG, as many are dissatisfied with the companies in which they invest (Matos, 2020; Jamwal et al., 2020). Ultimately, ESG is an essential concept for business practice as an intangible asset that creates long-term financial and social returns (Edmans, 2023; Ma et al., 2023). For decades, the framework of ESG has been used by managers to set standards, account for, and communicate sustainability issues with stakeholders.

Corporate Social Responsibility and Stakeholder Awareness

CSR is a framework that business managers can use to be more socially accountable to shareholders, stakeholders, and the public. Business tools for enhanced

corporate social responsibility and stakeholder awareness include the materiality matrix, supply chain management, and sustainable human resources management (HRM) (Tosun et al., 2022; Singh et al., 2020). The manufacturing sector has many stakeholders, from research and development to implementation and beyond, throughout all supply chains (Bastas, 2021). Business leaders using CSR must be transparent and ethical so that no stakeholder is exploited, harmed, or left out of consideration (Singh et al., 2023). Awareness of stakeholders, CSR, and social sustainability increases competitive advantage.

Materiality Matrix. The materiality matrix is a tool used to identify and prioritize economic, social, and environmental issues in business strategy. As a visual representation in mapping the significance of issues to the business and stakeholders, the materiality matrix can assist leaders in understanding the issues that most impact their business and stakeholders (Geldres-Weiss et al., 2021). Each matrix has two axes: materiality to the company on the x-axis and importance to stakeholders on the y-axis, and each issue is plotted on the matrix based on the significance and materiality of sustainability issues, such as pollution and ethical material sourcing (Abubakr et al., 2020; Córdova-Aguirre & Ramón-Jerónimo, 2021). Sustainability issues on a materiality matrix depend on the business's context and stakeholders.

Supply Chain Sustainability. Sustainability in supply chain management refers to maintaining processes without negatively impacting humans or the environment. Many business leaders are challenged with implementing sustainable practices within their supply chains and face barriers such as globalization, outsourcing, offshoring, and lack of

incentivization (Khanfar et al., 2021; Sheng et al., 2022). Technology manufacturing companies need to transform supply chain systems to be more resilient and efficient while minimizing harm and barriers (Prasad et al., 2022; Qureshi et al., 2023). For example, manufacturing firms can focus on decreasing the footprint of production by increasing the recyclability of their products while reducing production costs and increasing competitive advantage (Abubakr et al., 2020; Psarommatis et al., 2021; Xia et al., 2023). Technology manufacturers must redesign supply chains for sustainability, balancing resilience and profitability while reducing environmental impact and promoting human welfare.

Global supply chains are increasingly oriented towards sustainability, aiming to enhance labor practices and minimize environmental impacts through risk reduction, optimization, and adoption of Industry 4.0 technologies. Primarily, global supply chains focus on goals to improve the three bottom lines, such as fair and equitable labor practices, decreasing pollution and resource use, and adapting and mitigating climate change (Abubakr et al., 2020; Bastas, 2021). Transparency and responsibility are central to supply chain sustainability and resiliency (Sheng et al., 2022). For example, blockchain applications that trace materials and resource consumption can be utilized to advance sustainable manufacturing supply chains due to the accuracy, trackability, and accountability of the technology (Khanfar et al., 2021; Prasad et al., 2022). The future of global supply chains depends on a sustainable framework that integrates technology to promote transparency, equity, and environmental stewardship for a responsible manufacturing ecosystem.

Sustainable Human Resource Management. Integrating sustainable HRM practices within corporate sustainability strategies is fundamental to fostering an environmentally conscious workplace. Sustainable HRM topics can range from encouraging employees to engage with global issues, adopting greener practices to ensure fair treatment and equal opportunities for all employees, and addressing oppressive institutional systems (Cahyadi et al., 2023; Singh et al., 2020). Sustainable human resource practices influence recruitment, leadership and management, employee training, and the incentivization of sustainable initiatives (Ince, 2022; Mansoor et al., 2021). Sustainable HRM can be bolstered by particular attention to diversity, equity, and inclusion (DEI) and green training.

Diversity, Equity, and Inclusion. Critical to sustainable business practices, DEI is a framework that business leaders use to promote fair treatment and full participation of all people, particularly those historically underrepresented. Integrating DEI in business practices creates an environment where everyone feels valued and heard, increasing creativity and innovation for sustainability solutions (Singh et al., 2023). In addition, DEI can also lead to talent attraction and retention rates and better decision-making and critical thinking from the inclusion of diverse perspectives (Ince, 2022). DEI is vital for organizational sustainability, promoting fairness, creativity, innovation, talent retention, and improved decision-making through diverse perspectives.

Green Training. Green training is a strategic initiative for companies to improve workforce skills and meet market demands and sustainability goals. Green training significantly boosts operational and technological readiness, ensuring employees can

manage resources efficiently (Richnák & Fidlerová, 2022; Qureshi et al., 2023). HRM is vital in selecting programs that offer practical experience, ongoing education, and certification while aligning with the company's sustainability goals (Ince, 2022; Singh et al., 2023). Green training boosts workforce skills, aligns employee knowledge with sustainability, and enhances operational readiness, with HRM selecting programs that support sustainability goals.

Conclusion

Current market trends require deeper consideration of impacts on people and the environment to address complex issues threatening future generations' quality of life and resource availability. Sustainable change requires transformational leaders. Transformational leaders use inspirational motivation, idealized influence, individual consideration, and intellectual stimulation as core practices in catalyzing change for improved sustainability. In technology manufacturing, these changes include reducing products' negative environmental and social footprints while increasing efficiency and innovation. Guided by the UN SDGs and Industry 4.0, sustainable technology manufacturing involves various assessment tools to shape strategies, including digitalization, life cycle assessments, environmental impact assessments, ESG, CSR, and green training in HR management.

Transition

In Section 2, I reviewed professional and academic literature and discussed the application of transformational leadership strategies to the applied business problem. In the next Section, I discuss the project ethics, nature of the project, population, sampling,

and participants, data collection activities, interview questions, data organization and analysis techniques, and reliability and validity. Lastly, in Section 4, I present the findings, business contributions, recommendations for professional practice, implications for social change, recommendations for further research, and the conclusion.

Section 3: Research Project Methodology

I identified participants from the target population of technology manufacturing managers in the Western United States using two criteria: (a) their company must have publicly available reports on successful organizational sustainability implementation, and (b) they should have a minimum of 2 years of experience in sustainability initiatives. I collected data through semistructured interviews and organized and analyzed the information using thematic analysis. To ensure the reliability and validity of my data collection and analysis, I implemented a field-tested interview protocol, conducted member checking to verify my interpretations, developed a refined codebook and themes, and confirmed that data saturation had been achieved.

Project Ethics

My role as the researcher was reflexive in managing any impact on data collection. Researchers cannot separate their role from the research and must reflect on academic foundations, biases, values, and worldviews to address their findings' ethical considerations and validity (Darwin Holmes, 2020; Martins et al., 2020). While conducting qualitative research, interviewers must be self-aware of their role in the data collection processes and refine interview protocols to explore complex constructs in a thoughtful and focused way and answer the research question in a trustworthy, reliable way (Braaten et al., 2020; Collins & Stockton, 2022; Rose & Johnson, 2020). After collecting interview data, researchers can use member checking to ensure that they correctly understand the participant responses, improving reliability and minimizing the impact of their worldview (Candela, 2019; Motulsky, 2021). Lastly, reaching data

saturation confirms that data is a complete set of themes that will provide objectively reliable findings (Guest et al., 2020). To address my role as the researcher, I used an interview protocol and reflexive log, utilized member checking, and reached data saturation with thematic coding of interview data.

Understanding the researcher's relationship with the research topic, research area, and participants is important for mitigating any impact they could have on data collection and interpretation. I am a sustainability expert and have worked in the field for over 15 years in the Western region of the United States. With an education and career focused on sustainable business strategies, I have worked for manufacturers as a sustainability consultant, marketing manager, and grant writer, gaining experience in many aspects of sustainable business in the technology manufacturing industry. Identified through LinkedIn, I have mutual connections with the possible participants through education and work histories.

Research ethics are both procedural and socio-political. For example, research ethics include consent form disclosures, site agreements, research procedures, funding and affiliation transparency, political pressure, compliance with ethical research codes, and the power relationship between the researcher and participant (Braun & Clarke, 2022; Yin, 2018). As outlined by the *Belmont Report* (Pritchard, 2021), the researcher's ethical roles involve respecting participants' autonomy through informed consent, ensuring fairness in participant selection and treatment, and minimizing the risk of harm. The procedural ethical considerations I used included (a) obtaining the IRB approval #01-06-25-1059194, (b) providing informed consent to participants and ensuring the

autonomy of the participants, (c) protecting the confidentiality of participant identities, and (d) guaranteeing significant cybersecurity for participant information and data.

First, I provided informed consent before the interview through a consent form, which was sent in an email and reiterated in the script at the beginning of each interview. In addition, the consent form I used includes procedures for withdrawing from the study through email in the consent form, allowing participants to communicate that they wish to leave the study at any stage of the interview process. I showed gratitude to the participants for volunteering in both the consent form and before the interview. Second, I maintained participant confidentiality using sample name coding to avoid all identifiers and protect any non-public contact information of participants that may be shared. Third, to ensure data security and participant confidentiality, I am storing data using password protection and cloud storage and will destroy it after 5 years.

Nature of the Project

I used the qualitative research method in this study. Qualitative research methodology is used to explore problems by analyzing detailed communications about the experiences of research participants (Busetto et al., 2020; Prosek & Gibson, 2021). Qualitative research is valuable for the insight researchers can gain from people's experiences through interviews about addressing real-world challenges with impactful, practiced solutions (Bougie & Sekaran, 2019). I chose the qualitative methodology over the other possible methods, quantitative and mixed method, because it aligned best with the business problem to be explored and the type of data collected from semistructured interviews. In addition, I selected the qualitative research method for this study because it

allows for in-depth data to be collected to address complex experiences in business practices and find solutions to problems.

Research designs are the structure for data collection and analysis. Under the qualitative research methodology, researchers can use different designs to explore and interpret connections between concepts and constructs of lived experiences (Prosek & Gibson, 2021). Multiple research designs, including ethnographical, case study, and pragmatic inquiry, were considered for this study. Researchers use ethnography and case study designs to focus on lived experience (Harwati, 2019; Neubauer et al., 2019). These alternative designs were not selected for this study because they do not allow researchers to study how others have solved problems. The pragmatic inquiry research design was selected because it allows for problem-solving and in-depth data collection about complex, lived experiences.

Population, Sampling, and Participants

The target population was SMEs technology manufacturing managers from the Western region of the United States who had implemented organizational sustainability strategies. I selected participants based on the criteria of (a) their company having publicly available reports about successful organizational sustainability implementation and (b) at least 2 years of experience implementing sustainability initiatives. Researchers can use purposive data sampling to study a specific interest with improved trustworthiness and credibility; however, too many purposive criteria for data sampling can lead to reduced external validity (Andrade, 2020; Campbell et al., 2020; Denieffe, 2020). Within a purposely selected sample population, researchers can still capture

diverse information from a range of participants; however, with more specific criteria, researchers can increase the similarity between participants, the better the reliability of the findings (Braun & Clarke, 2022; Nyimbili & Nyimbili, 2024). Therefore, I thoughtfully used the purposive sample selection criteria to align with the purpose of this study and collect rigorous data.

I used purposive criterion sampling to select seven participants from the target population in this study. A sample size of six to eight participants is needed for rich qualitative data (Braun & Clarke, 2022). Due to the requirements for saturation in qualitative research, the researcher determines data saturation during the data collection process (Braun & Clarke, 2022; Hennink & Kaiser, 2022). Data saturation is reached during the data collection process when there is a redundancy of information, and researchers do not collect any new information from interviews (Alam, 2020; Braun & Clarke, 2022). I heard redundant information from the fifth participant and continued interviewing until I reached data saturation. I stopped collecting data after the seventh participant when I reached data saturation. In addition, I reached data saturation with thematic analysis when I analyzed the data in iterations after each interview. Data saturation is reached when there is redundancy of information for themes and sub-themes of the data (Bartholomew et al., 2021; Braun & Clarke, 2022). I also reached data saturation during the thematic analysis, where no new information was interpreted in the analysis process. In addition to hearing redundant information in the fifth interview, I also began to have redundant information during the thematic analysis process after the

fifth interview. Therefore, I continued adding to my participation sample and conducting thematic analysis until I reached saturation after the seventh interview.

My strategy to gain access to participants was to find managers with publicly available contact information through LinkedIn and the International Society of Sustainability Professionals and cross-reference that (a) the company they work for has a publicly available sustainability report published and (b) that the manager has had at least 2 years in the field publicly available on LinkedIn. Researchers can effectively search for and communicate with participants who align with the purposive sampling criteria for their target population through social networking and online messaging (Cheron et al., 2022; Keniry, 2020). I may have appeared as trustworthy when approaching potential participants through a professional and social network, where I share mutual connections with managers in technology manufacturing from my work history.

Written and verbal communication is vital for building a trusted relationship with participants. Researchers use invitations and consent forms to build a trusting relationship between themselves and participants and show they are mindful of the participants' disclosure of information (Xu et al., 2020). Remote data collection of verbal communication can create rapport with participants, increase accessibility, and protect participant anonymity (Archibald et al., 2019; Lobe et al., 2020; Reñosa et al., 2021). I built a positive relationship with the selected participants using written and verbal communication. To initiate communications with participants, I sent online messages to introduce the study and provide informed consent. Then, during the semistructured interviews, I communicated verbally with participants through a remote connection.

Lastly, member checking and sharing of the findings required further written communication through email. Informed consent, member checking, and sharing results were used to show transparency and respect to the participants for providing data for the study.

Data Collection Activities

I was the primary data collection instrument as a researcher collecting data to address the research question. Researchers must ensure data is correctly gathered to effectively address their research question (Busetto et al., 2020). Semistructured interviews are data collection techniques researchers use to collect in-depth data through preplanned, open-ended, and follow-up questions (Elhami & Khoshnevisan, 2022). I used an interview protocol during the interview process so that each interview I conducted followed the same structure, and I could gain a deeper understanding of the interviewee's responses.

Consistency is key to maintaining data quality. Therefore, I consistently used an interview protocol [see Appendix] in each interview. Quality control tools, such as interview protocols, are crucial for researchers to maintain the data quality they collect and limit the researcher's role as much as possible (Albert & Csizér, 2022; Busetto et al., 2020). After obtaining IRB approval (approval number for this study is 01-06-25-1059194), participants were contacted to participate. The interview protocol included gratitude for the participant's voluntary participation, an overview of the purpose of the study and the interview process, informed consent and participant privacy, a set of open-ended interview questions, and a conclusion with a reminder that their answers will be

interpreted and sent to them for member checking. I provided the interview questions in the consent form before the interview and used the same questions word for word and in the same order for the interview protocol in all the interviews.

I used member checking to improve the reliability of the data I collected. I also used a field-tested interview protocol to improve the reliability and validity of the data I collected. Researchers can collect reliable data through semistructured interviews using member checking, which ensures that the researcher's interpretation of the participant's response is correct, which allows for cross-verification and access to broader perspectives (Braun & Clarke, 2020; Busetto et al., 2020). The limitations of the semistructured interview included the potential for misinterpretation of the interview questions and the participants' responses, as well as the lack of statistical analysis available for the qualitative data type. Being aware of these limitations ensured that the data was carefully collected and interpreted correctly.

Interview Questions

1. What strategies have been most successful at achieving sustainability goals?
2. What approaches have helped you address resistance to sustainability initiatives?
3. What techniques have been successful in encouraging innovative thinking?
4. What additional information can you share regarding sustainability that we have not discussed?

Data Organization and Analysis Techniques

Qualitative researchers design systematic approaches to tracking data and emerging interpretations. Researchers can organize data using audio and text files,

journals and notebooks, research logs, and tables to produce meaningful interpretations of complex data (Braun & Clarke, 2022; Naeem et al., 2023). I used audio recordings of interviews, interview transcripts, a research log, a reflexive journal, a table for categorizing and compiling data, and a pre-codebook and codebook to track data in my study.

I organized the data in preparation for conducting Braun and Clarke's (2006) thematic analysis. The six phases of thematic analysis are (a) familiarizing yourself with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes, and (f) producing a report (Braun & Clarke, 2006). Thematic analysis begins with Phase 1, familiarizing yourself with the data. In this phase, researchers should transcribe interview data and immerse themselves in the data (Braun & Clarke, 2006). To begin the thematic analysis, I transcribed verbal interview data into written transcripts, compiled and cataloged responses in an Excel spreadsheet, and reviewed them with audio recordings to ensure the transcription was accurate. To protect the anonymity of my participants, I created a coded labeling system to label the interviews without names. I reviewed the transcripts to form an initial interpretation to share in member checking to increase the accuracy and reliability of my analysis. Then, I annotated possible meanings and patterns in a research log.

To begin Phase 2 of thematic analysis, generating initial codes, I created preliminary codes in a pre-codebook and coded the data. Thematic analysis is a systematic process researchers can use to better understand complex data through systematic coding (Braun & Clarke, 2022; Ozuem et al., 2022). Qualitative researchers

conducting thematic analysis use a pre-codebook to guide the interpretation of data based on pre-determined interview questions (Bougie & Sekaran, 2019). To create the initial pre-codebook, I assembled data within each interview question category and identified a list of codes from patterns I saw in the data. Coding reliability includes, in part, focusing on themes that emerge concerning the interview questions and the meaning of responses to those questions in the context of the conceptual framework; however, codes can emerge throughout the data analysis process (Braun & Clarke, 2022; Mwita, 2022; Yin, 2018). When I coded the data, I manually combed through the entire transcript with an open mind, looking for emerging patterns, adding codes to the codebook, and assigning a color-coded system to designate transcript excerpts that match possible codes.

In the Phase 3 of thematic analysis, searching for themes, I searched for themes by sorting codes from the codebook into broad patterns and themes. Themes emerge from collating coded data and identifying the connections between codes (Braun & Clarke, 2006; Ozuem et al., 2022). After reviewing my research log and codebook, I began by sorting relevant coded data excerpts into an Excel table organized by possible themes. In my research log, I developed and defined possible themes and subthemes as they emerged from individual coded data pieces connected to key concepts related to organizational sustainability and transformational leadership. I conducted the thematic analysis process after each interview, sequentially and iteratively, until data saturation was reached.

The Phase 4 of thematic analysis is reviewing themes. In this phase, I reviewed and refined the identified themes. Researchers should evaluate candidate themes based on

internal homogeneity, how well data within themes correspond together, and external heterogeneity, distinctions between themes (Braun & Clarke, 2006). To evaluate the internal homogeneity, I read through the coded data excerpts organized into potential theme categories and determined if the data excerpts together created a comprehensive and sound theme. Then, to evaluate the external heterogeneity, I evaluated the validity of the themes based on how well they align with the entire data set and the foundations of the study. I refined themes that needed to be adjusted by reorganizing coded data excerpts and reworking candidate themes.

In the Phase 5 of thematic analysis, defining and naming themes, I defined and named themes when I was satisfied that the candidate themes fit the data set and study. Theme names should encompass the nuances and richness of the data, describing the core of each theme (Braun & Clarke, 2006). To define the themes that emerge from coded data, researchers should write brief, detailed analyses of each theme's narrative and how the theme relates to the research question (Braun & Clarke, 2006). In this phase of thematic analysis, I first identified the themes and possible sub-themes by reviewing and refining the organization of coded data. Then, I wrote an in-depth narrative describing each theme's scope, writing a short paragraph for each theme in my research log. Lastly, after reviewing the scope of each theme, I developed the working theme names into the final names that concisely and accurately describe the theme.

In Phase 6 of thematic analysis, producing a report, I generated my analysis report. Researchers should use fully developed themes to describe the findings from the thematic analysis, using coded data excerpts to increase the validity of findings (Braun &

Clarke, 2006; 2022). In addition, researchers need to write a report of the analytic narrative that makes an argument related to the research question. To complete the thematic analysis and write an abstract of my findings, I selected data excerpts that showcase a clear, striking meaning for the theme narrative. Then, I used the theme narratives from my research log and data excerpts to produce a cohesive report on my findings. Lastly, I reviewed new studies published about transformational leadership and organizational sustainability and included how my findings connect with the main topics from the body of literature.

Data storage and destruction are essential for data organization. Researchers utilize cloud storage to maintain confidentiality, address trustworthiness, and protect against potential data loss (Williams, 2023). Researchers must delete data after 5 years to comply with data retention policies and protect participant privacy (Scope et al., 2022). I stored all data from this study using protected passwords and secure data storage using cloud server technology. Also, I will destroy all data 5 years after the publication of this study, ensuring the utmost confidentiality and security.

Reliability and Validity

Reliability and validity are crucial research concepts. Researchers delineated the criteria for trustworthy data as credibility, dependability, confirmability, and transferability (Lincoln et al., 1985; Lincoln & Guba,1986). Although qualitative data analysis is naturally subjective, researchers can improve the reliability and validity of their findings by thoroughly addressing these trustworthiness criteria (Candela, 2019;

Kakar et al., 2023). Implementing these standards allows researchers to create a credible framework for their insights.

Reliability

Reliable research stems from dependable data. Researchers can collect dependable data through consistent data collection tools like protocols and trustworthiness plans (Adler, 2022). To address the dependability of my data collection, I first wrote a trustworthiness plan in this proposal. When collecting data through semistructured interviews, I used a field-tested interview protocol [see Appendix]. The field tests of my interview protocol showed that the opening and ending statements effectively summarized the key details and encapsulated the interview. Also, the disclosure regarding the topics they were permitted and prohibited from discussing was very clear. To further the dependability of data collection, researchers should verify the interpretation of the data collected through member checking (Candela, 2019). After I collected interview data, I shared my data interpretation with the participants for thorough and transparent member checking. Moreover, researchers can increase the consistency of their findings by maintaining clear and rigorous accounts of research decisions and activities (Nassaji, 2020). I maintained a detailed research log that began with initial research decisions, continued through data collection and analysis, and was completed before study submission.

Validity

Valid data is characterized by credibility, transferability, and confirmability. Credible findings can be trusted to reflect reality truthfully, similar to internal validity in

quantitative research (Lincoln & Guba, 1986; Nassaji, 2020). First, to address data credibility, researchers should cross-check that they understand participant responses by sharing their interpretations through member checking (Candela, 2019; Yin, 2018). To protect credibility, I used member checking with participants to confirm my interpretation was correct. In addition, I achieved data saturation to increase the credibility of my findings.

Researchers have a crucial role in determining when data saturation is reached. Data saturation is confidently achieved when information redundancy is observed during data collection and analysis (Braun & Clarke, 2022; Mwita, 2022). Data saturation is achieved during data collection when researchers do not collect any new information from interviews (Alam, 2020). Data saturation is reached during thematic analysis when there is redundancy of information for themes and sub-themes (Braun & Clarke, 2022). I achieved data saturation during data collection by conducting interviews until I did not learn any additional information from the interviews. I also reached data saturation with thematic analysis when I continued coding until no new themes emerged.

Transferability refers to how research findings can be applied to different contexts and settings, similar to external validity and generalizability (Lincoln & Guba, 1986; Kakar et al., 2023). Researchers can support the transferability of their findings through detailed, thorough, and meaningful descriptions of data interpretations (Adler, 2022; Candela, 2019). To address transferability, I kept an accurate and detailed account of my research, describing my decisions and the process I used to collect and analyze data. In addition, researchers should be reflective and transparent about their assumptions to

increase the transferability and reproducibility of their findings (Braun & Clarke, 2020; Nassaji, 2020). I maintained a research log that will include my reflexive journal about the rationales and assumptions I used to create the codebook, themes, and descriptive narratives.

Confirmability is essential for maintaining the consistency, repeatability, and neutrality of researchers' findings, and it refers to minimizing the researcher's role in the research (Lincoln & Guba, 1986; Kakar et al., 2023). Researchers should keep a detailed audit trail of data analysis decisions, interpretations, and research log notes throughout the data analysis process so that others can confirm the findings (Braun & Clarke, 2020; Nassaji, 2020). I addressed confirmability by maintaining detailed research logs throughout each step of data collection and analysis. I kept a research log that will include a reflective journal where I wrote about my influence in the role as the researcher, potential biases from my worldview, and other reflections about my assumptions. In addition, researchers can also use member checking to confirm that they interpreted what the participant said correctly (Candela, 2019). I also utilized member checking to ensure I accurately interpreted and conveyed the participants' statements during interviews.

Transition and Summary

In this study, I aimed to explore effective strategies used by technology manufacturing managers from SMEs to achieve and manage organizational sustainability. In Section 3, I wrote about the project ethics, nature of the project, population, sampling, and participants, data collection activities, interview questions, data organization and analysis techniques, and reliability and validity. In Section 4, I present the findings,

business contributions, recommendations for professional practice, implications for social change, recommendations for further research, and the conclusion.

Section 4: Findings and Conclusions

Presentation of the Findings

The purpose of this qualitative pragmatic inquiry study was to explore leadership strategies used by technology manufacturing managers from SMEs to achieve and manage organizational sustainability. The research question was: What are the leadership strategies technology manufacturing managers use to achieve and manage organizational sustainability? I collected data through semistructured interviews to gain a deeper understanding and identify patterns that address the research question (see Table 1). The target population was SME technology manufacturing managers from the Western region of the United States who had implemented organizational sustainability strategies. I selected participants based on the criteria of (a) their company having publicly available reports about successful organizational sustainability implementation and (b) at least 2 years of experience implementing sustainability initiatives.

Table 1

Participant Demographics

Participant	Gender	Role	Years of experience
P1	Male	Director of sustainability	20
P2	Male	Carbon engineer	10
P3	Female	Vice president	30
P4	Female	Program manager	5
P5	Female	Marketing director	20
P6	Male	Founder, CEO	15
P7	Male	Design engineer	10

To address this research question, the main themes identified from data collected are (a) leadership and company culture, (b) collaboration, inclusion, and diversity for innovation, (c) framing sustainability as business success, (d) community, ethical responsibility, and justice, (e) stakeholder engagement and overcoming resistance. These themes were identified using Braun and Clarke's (2006) thematic analysis, where overarching patterns emerged from data collected and concepts described in the literature review.

Theme 1: Leadership and Company Culture

Sustainability efforts are most successful when deeply aligned with organizational leadership, embedded in company culture, and supported by a clear long-term vision. Leaders using transformational leadership theory inspire and motivate by embedding a clear, authentic vision into the organization's core identity, fostering deep commitment and cross-departmental engagement (Bass & Riggio, 2006). By setting strategic goals and modeling values, leaders leveraging transformational leadership theory act as catalysts for enduring change, ensuring sustainability becomes a priority rather than a temporary initiative (Ahmadi-Gh & Bello-Pintado, 2022). For example, P5 stated that "the key is starting with a strategy that's authentic, clear, and backed by leadership. If the strategy is grounded in the company's DNA, the sustainability initiatives will thrive." Without authentic leadership commitment and cultural integration, sustainability efforts risk becoming fragmented or superficial. Transformational leadership theory enables leaders to promote a strategy that integrates long-term strategic alignment and core

organizational values, leading to more successful organizational sustainability initiatives and overall impact.

Transformational leadership theory supports long-term visioning and goal setting by inspiring organizations to pursue lasting sustainability impacts. Business leaders who incorporate long-term visioning and goal-setting into their sustainability strategies can achieve lasting impacts. For example, P3 said, “a long-term approach ensures that companies move beyond short-term fixes and invest in lasting solutions.” Furthermore, the integration of advanced technologies, such as AI, blockchain, big data, and automation, enhances these efforts by enabling data-driven decisions, improving operational efficiency, tracking emissions, and increasing transparency and measurability across the supply chain (Kannan & Gambetta, 2025; Qureshi et al., 2023).

For example, P1 said, “many businesses have developed blockchain-based solutions that allow companies to track and verify the sustainability of their supply chains in real-time,” and P6 said, “consumers and industry professionals now demand measurable, evidence-backed sustainability efforts.” Transformational leadership theory is essential for embedding sustainability as a long-term organizational priority rather than a series of isolated initiatives (Bass & Riggio, 2006). Moreover, integrating technologies alongside transformational leadership strengthens visioning by enhancing data-driven decision-making, transparency, and measurable outcomes. Without such leadership, sustainability efforts risk lacking direction, authenticity, and the technological rigor necessary to meet growing stakeholder demands.

Theme 2: Collaboration, Inclusion, and Diversity for Innovation

Innovative thinking is essential for advancing sustainability. Leaders employing transformational leadership theory foster inclusive, open environments necessary for innovative thinking to advance sustainability (Begum et al., 2021). By empowering individuals at all organizational levels and encouraging inclusive cross-disciplinary collaboration, transformational leaders create a culture where diverse perspectives are valued, and innovation is intentionally cultivated (McKim & Goodwin, 2021; Shang, 2023). For example, P7 said, “openness to diverse perspectives is also crucial for innovation,” and P4 said, “innovation doesn’t just happen by accident. It’s something that has to be cultivated, encouraged, and supported in the right environment.” In addition, P4 said that “a lot of times, the best ideas don’t come from a single person working in isolation; they come from people with different backgrounds and expertise coming together, sharing perspectives, and challenging each other to think differently.”

Business leaders who reward creativity, promote experimentation, and engage employees in sustainability challenges tend to generate more resilient and impactful solutions. Leaders utilizing transformational leadership theory empower individuals across disciplines and encourage integrating varied perspectives to create conditions for adaptive innovation and forward-thinking solutions (Begum et al., 2021). From P5, "creating a routine like Friday Idea Lunches encouraged team members to share fresh ideas and celebrate creativity." Also, P3 stated that they “recognize employees who think innovatively and try to improve things, even if their ideas don’t always work out. It’s about rewarding the intent behind the effort.” Innovation is often incremental and shaped

by learning from failure, requiring continuous refinement (Debnath et al., 2023; Muniapan et al., 2024). P6 explained:

> failure doesn't bother me. It's a learning opportunity. Every failure provides insight into whether an idea was a dead end, a marketing problem, a convenience issue, or simply ahead of its time. Instead of frustration, I focus on understanding why something didn't work and adjusting my approach accordingly.

Without leadership that cultivates inclusive, collaborative environments, organizations risk stagnation and a failure to generate the diverse ideas necessary for meaningful advancement.

Theme 3: Framing Sustainability as Business Success

Resistance to sustainability initiatives is reduced when organizations frame them as strategic business opportunities rather than burdensome obligations. Demonstrating financial benefits, such as cost savings, increased efficiency, and long-term resilience, helps gain stakeholder buy-in (Jasiulewicz-Kaczmarek et al., 2023). For example, P1 stated, "the reality is that sustainability requires change, and change can be uncomfortable, expensive, or difficult to implement at scale. Many organizations have tackled this challenge by focusing on one key principle: make sustainability a business advantage, not a burden." P6 said, "ultimately, sustainability efforts need to balance financial viability, consumer demand, and systemic change. While progress is happening, there is still a long way to go to create widespread, lasting impact."

P6 went on to say, "banks were not willing to take the risk, highlighting the barrier that sustainable innovation often requires significant initial capital, which many

businesses lack." Financial viability is critical, and many sustainable efforts falter due to high initial costs or delayed returns (Niewiadomski & Stachowiak, 2024). Therefore, aligning sustainability with profitability and consumer demand is essential to ensure successful and lasting implementation. Leaders using transformational leadership theory help shift organizational mindsets, encouraging stakeholders to view sustainable practices as beneficial investments (Begum et al., 2021). Transformational leadership is essential for overcoming resistance to sustainability by reframing it as a source of strategic value. By influencing organizational perceptions, transformational leaders increase stakeholder support and accelerate the adoption of sustainable practices.

Theme 4: Community, Ethical Responsibility, and Justice

Sustainability initiatives are most effective when they integrate community needs, transparency, and ethical considerations. Aligning these efforts with social responsibility strengthens community support and fosters long-term success (Debnath et al., 2023). Transformational leadership theory is critical for embedding ethical values into sustainability initiatives (Al-Ghazali et al., 2022). Initiatives rooted in place-based practices and collaborative economic models build more resilient, equitable communities and ecosystems. For example, P4 said:

> by making sure that our sustainability initiatives align with the needs of the people around us, whether that's by supporting the local economy, creating educational opportunities, or working on projects that benefit environmental research, we build trust and buy-in from the community.

Also, P3 stated that “if you truly believe in sustainability, it can’t be just about yourself or your company. It has to be about future generations.” P3 followed this statement with, “true success isn’t just about monetary gain. It’s about contributing back to the community. You can live well and still do the right thing." Prioritizing local resources and uplifting underserved voices is essential to advancing equity and justice within sustainability efforts. Leaders using transformational leadership theory are essential for embedding ethical values, social responsibility, and community engagement into sustainability efforts. Without leadership prioritizing equity, transparency, and collaboration, initiatives risk being perceived as self-serving and may fail to achieve lasting community support.

Theme 5: Stakeholder Engagement and Overcoming Resistance

Companies effectively advance sustainability initiatives by engaging stakeholders early, tailoring solutions to business-specific needs, and emphasizing education, internal training, and transparent communication. P4 said, “the best way to get people on board with sustainability initiatives is to show them why it’s beneficial rather than just telling them they need to do it.” In addition, P3 said,

> the key is not to treat people as enemies. Even if there’s resistance, try to figure out how to bring them into the model, incorporate their concerns, and solve them. It's always been about having a bigger vision than just making money.

In overcoming resistance, leaders empowered with transformational leadership theory foster stakeholder engagement, promote education, and emphasize transparent communication about accessible solutions (Gan & Voon, 2021; Nguon, 2022). When

employees and stakeholders understand the long-term benefits, they are more likely to support change (McKim & Goodwin, 2021; Niewiadomski & Stachowiak, 2024).

However, widespread skepticism toward superficial sustainability claims has led to increased scrutiny from consumers and regulators, making third-party certifications, measurable metrics, and life cycle analyses essential for credibility. For example, P7 stated that "greenwashing has made consumers skeptical, so backing up claims with research and third-party verification has been essential." At the same time, resistance persists due to entrenched consumer habits and industry norms favoring convenience and low-cost options. Overcoming this resistance requires solutions that are simple, accessible, and supported by incentives or broader cultural shifts. Leaders applying transformational leadership theory drive cultural shifts necessary to align stakeholder behavior with long-term goals and decrease skepticism.

Theme Connections to Transformational Leadership Theory

These themes align with the literature about transformational leadership theory by showcasing the strategic, motivational, and ethical foundation needed to advance comprehensive, resilient, and credible sustainability transformations in business. Transformational leadership theory is used by technology manufacturing managers to drive sustainability by embedding shared values, vision, and long-term goals into company culture, ensuring initiatives endure and produce meaningful change (Ahmadi-Gh & Bello-Pintado, 2022; Bass, 1985). Furthermore, transformational leadership theory can be used by managers to foster open, innovative environments through intellectual stimulation and individual consideration, empowering cross-disciplinary collaboration

and encouraging diverse perspectives, building community trust, and advancing equity, which is key to overcoming resistance (Al-Ghazali et al., 2022; Debnath et al., 2023). Managers who use transformational leadership theory are essential for driving organizational sustainability by integrating shared values and long-term goals into company culture, fostering innovation, and promoting equity through cross-disciplinary collaboration.

Comparing transformational leadership theory with the themes shows both overlaps and differences. Transformational leadership theory includes idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Riggio, 2006). Themes 1 and 2 reflect visionary strategies, inclusive collaboration, and innovation, aligning with transformational leadership theory to enhance employee engagement and cultural transformation needed for sustainability (Redman & Wiek, 2021; Ha & Moon, 2023; Jun & Lee, 2023). Additionally, the literature and the themes highlight the role of managers leveraging transformational leadership theory in fostering environments advantageous to innovation, learning, and employee empowerment, which are vital for responding to complex social and environmental challenges (Begum et al., 2020; Crucke et al., 2022). However, the themes go beyond transformational leadership theory by integrating constructs from organizational sustainability and change management.

Several themes expand beyond transformational leadership theory by incorporating external pressures, cultures of inclusion, and structural constraints as a strategic and operational necessity, not merely a motivational endeavor. For example, the

themes expand beyond traditional transformational leadership theory by introducing frameworks like ESG, CSR, and stakeholder accountability. Theme 5 emphasizes measurable outcomes and third-party certifications driven by external pressures, differing from Bass's (1990) inward leader-follower dynamics. Theme 2 encompasses the value of DEI for innovation, which is not a clear aspect of transformational leadership theory. However, diverse and inclusive cultures are essential for innovation (Singh et al., 2023). In addition, Themes 3 and 4 highlight a more incremental, systemic, and justice-oriented perspective on sustainability changes. While organizational change necessitates a robust transformational catalyst to effect a paradigm shift, sustainability transformations demand ongoing commitment and substantial investment (Mio et al., 2021; Stocker et al., 2022). Transformational leadership theory does not equip leaders with the strategies to meet these contemporary needs. Therefore, technology manufacturing managers must use internal motivational strategies toward a holistic, systems-based approach that aligns with broader frameworks like ESG, SDGs, and Industry 4.0.

Business Contributions and Recommendations for Professional Practice

This study's findings may cultivate technology manufacturer managers' ability to transform organizational business practices. Technology manufacturing managers can integrate sustainability into business strategies, improve the effectiveness of initiatives, and develop a competitive advantage through better innovation, strengthened stakeholder commitment, and increased empowerment of followers (Ahmadi-Gh & Bello-Pintado, 2022; Shahzad et al., 2022). Technology manufacturing enterprises can be improved by integrating sustainability concepts, maintaining long-term success from eco-innovative

products that ensure the well-being of employees, customers, and communities, and improving brand reputation for expansion to new markets (Jamwal et al., 2021; Shahzad et al., 2022). Sustainable business strategies can be used to effectively improve business practices and create positive, transformational changes for the betterment of humanity.

Implications for Social Change

This study is significant because the findings may inform sustainability leaders and expand their ability to transform organizations to have a better positive social impact. Sustainability concepts in technology manufacturing businesses can lead to economic development, reduced risk, social cohesion, innovation, and community development through attention to employees, customers, individuals, and communities affected by operations, supply chains, and waste streams (Sheng et al., 2022; Martínez-Peláez et al., 2024). This stakeholder awareness, along with innovative social entrepreneurship, can be used by managers to transform business practices and address complex social and environmental problems affecting people's quality of life locally and globally.

Recommendations for Further Research

This qualitative pragmatic inquiry study explored leadership strategies used by technology manufacturing managers from SMEs to achieve and manage organizational sustainability. The study population was SME technology manufacturing managers from the Western region of the United States who had at least 2 years of experience implementing sustainability initiatives. In this study, I was limited by the scope and availability of the sample population, as well as by the potential for participants to provide biased or untruthful information. Future researchers could address these

limitations by including participants from more diverse geographical areas and roles. Ensuring participant anonymity and following protocols will also help to address the credibility of data.

The five themes identified through data analysis were (a) leadership and company culture, (b) collaboration, inclusion, and diversity for innovation, (c) framing sustainability as business success, (d) community, ethical responsibility, and justice, and (e) stakeholder engagement and overcoming resistance. Participants discussed internal and external stakeholder engagement; however, future researchers could expand on the necessity of investing in green training for internal stakeholders. In addition, researchers could explore external stakeholders and the need for multi-organizational collaboration to develop the nuance of the interconnections and opportunities for collaboration. Lastly, many participants mentioned professional burnout and the need to focus on personal resilience to maintain motivation to continue both their careers and improve the success of future organizational sustainability initiatives.

Conclusion

This study explored the leadership strategies used by technology manufacturing managers to achieve and manage organizational sustainability. Through semistructured interviews and thematic analysis, five central themes emerged that included (a) leadership and company culture, (b) collaboration and inclusion for innovation, (c) framing sustainability as business success, (d) community and ethical responsibility, and (e) stakeholder engagement to overcome resistance. These themes revealed that successful sustainability practices are deeply embedded in authentic leadership, organizational

culture, long-term strategic visions, inclusive innovation, and community engagement. Participants emphasized the need for data-driven approaches, the significance of recognizing both internal and external stakeholder roles, and the importance of framing sustainability not as a burden but as a strategic advantage capable of driving innovation, market growth, and positive societal impact. Implications for positive social change included expanding managers' ability to transform organizations to have a better positive social impact. These findings can be used to improve professional practice by integrating sustainable principles into core business operations.

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Appendix

Introduction:

Thank you for volunteering your time today to participate in this study. Before we begin, I need to go over some The purpose of my research is to explore effective strategies used by managers from technology manufacturing enterprises to achieve and manage organizational sustainability.

I will be asking you four questions about your sustainability strategies. These are the same questions on the written consent form you signed to agree to participate in this study. After this interview, I will also ask you to review my interpretation of your responses and provide any feedback you want to share to ensure I understand you correctly. When my study is complete, I will share a summary and link to the published study with you. I'm looking forward to learning from your expertise. Before we begin, I want to go over your consent and how I will ensure your privacy.

We are required to comply with non-disclosure agreements and trade secrets laws, so please share your general industry experiences and observations without discussing any organization's specific name or operations. If you accidentally mention the organization name or confidential information, I will need to redirect the interview, and immediately after the interview, I am required by my university to permanently delete all proprietary information.

Your privacy is important to me, and I will keep your identity confidential. I will not use your personal information for any purpose outside this research project and will not include your name or anything else that could identify you in the study data or

reports. The information you provide today will be securely stored and destroyed after 5 years. If you have any questions after the interview, you can reach me through email or phone. If you want to talk privately about your rights as a participant in this study, you can reach out to Walden University's Research Participant Advocate with the number in the written consent form.

Interview Questions

1. What strategies have been most successful at achieving sustainability goals?
2. What approaches have helped you address resistance to sustainability initiatives?
3. What techniques have been successful in encouraging innovative thinking?
4. What additional information can you share regarding sustainability that we have not discussed?

Conclusion

Thank you very much for answering my questions today. I look forward to transcribing and interpreting your responses. After I interpret your responses, I will ask you for any feedback you want to share about my interpretation to ensure that I understand what you said.