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Strategies to Implement Efficient Manufacturing Systems to Improve Companies' Performance

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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Ihebuche Miracle Okorie

MS, Liberty University, 2014

BS, Kennesaw State University, 2010

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Researchers have demonstrated that many manufacturing managers have used successful manufacturing strategies to improve their company's performance. Manufacturing managers search for successful strategies to implement efficient manufacturing systems because inefficient manufacturing systems can negatively affect their company's performance. Using transformational leadership as a conceptual framework, the purpose of this qualitative single case study was to explore six U.S. manufacturing managers' strategies to implement efficient manufacturing systems to improve their company's performance. The participants were six manufacturing leaders of a company who had successfully employed strategies to implement efficient manufacturing systems. Data were collected from semistructured, open-ended interviews and a review of the company's performance metrics, quality documents, charts, and financial documents. Using thematic analysis, five themes emerged: (a) efficient manufacturing systems, (b) successful strategies, (c) operations management, (d) leadership behaviors and effects, and (e) competitive advantages. A key recommendation is for manufacturing leaders to select and use performance measurements to discover on-time manufacturing processes that need adjustment to improve performance. The implications for social change include successful manufacturing companies employing U.S. residents with a resultant reduction in the country's unemployment rate and contributing to the U.S. economy by paying local and federal taxes.

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Dedication

I praise and adore my God and way maker, Jesus Christ, through whose divine strength, love, and mercy this study was completed. My wife, Chinyere Okorie, my son, David Okorie, and my daughter, Eunice Okorie, have immensely contributed towards completing this study. I love and cherish my son and daughter for making the journey funny in many ways, including sleeping in my office while I wrote this study. This study is also dedicated to my mother, who has always been there to help me with the children while I studied and wrote. I especially dedicate this study to my father, Late Chief Senior Elder L.M. Okorie, through whose love for education I derive the courage to finish this study. The support and love of my brothers and sister towards completing this work will forever be remembered.

I thank God for all the members of HAPIC, my followers worldwide, and my spiritual sons and daughters who keep me busy day and night. My childhood friend and spiritual son, Chukwuezugo Ogwumike (Tiger), and his family vowed and have interceded for me every morning and night, sending me clips of these life-touching heart-felt prayers almost daily. Their contributions will not be forgotten. I especially thank my boss and friend, Bob Magnuson, for his love and support. His trust and belief in me will always be appreciated. Naid, your support in this journey will forever be remembered and appreciated.

Acknowledgments

This academic journey was difficult, but all thanks to the Almighty God, who gave me the victory through Jesus Christ. I will forever be grateful to Him for this wonderful favor. I can't thank Him enough for making this journey possible especially considering all my conflicting priorities. His Love has been the banner over me.

I would want to acknowledge my wife, children, and household for all the various parts they played throughout this journey. Your love and support will never go unnoticed. This success belongs to us all.

The six research participants played a major role in the accomplishment of this study. Your deep background and experiences in manufacturing leadership have positively added to this research. I extend this acknowledgment to the director and other top stakeholders who allowed me to conduct this interview in your facility.

My chair, Dr. Patsy Kasen, has been supportive throughout the journey. She stood by me like a family. She was there to encourage me all the time, including late nights and weekends. I acknowledge the support of my second chair, Dr. David Moody, whose line-by-line edits and perspectives were so helpful. Dr. Moody's edits were concise. I acknowledge my URR reviewer, Dr. Gregory Uche, for his timely and thorough reviews. I would like to acknowledge my program director, Dr. Gail Miles, and all the faculty members who helped me in various ways to accomplish this study.

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Section 1: Foundation of the Study

The manufacturing industry is one of the core contributors to the U.S. gross domestic product (GDP). According to the Bureau of Economic Analysis (BEA; 2022), the manufacturing sector added $2.768 billion to the GDP, which represents 11% of the total GDP. As the fourth largest industry in the United States, the BEA reported that over 15.6 million Americans were employed in the manufacturing industry in 2020. The manufacturing industry is one of the world's most competitive industries, and globalization, increasing technological development, competition, regulatory pressures, and other factors have posed a challenge to the management of manufacturing companies, making it crucial that the managers of these companies devise more successful strategies to implement efficient manufacturing systems to improve the performance of their organizations.

Background of the Problem

Managers express competitiveness in various business units to meet specific demands that translate into different competitive advantages (Maldaner & Kreling, 2019). U.S. manufacturing managers should adopt strategies to foster internal and external competitive advantages (Inman & Green, 2018). Kalyar et al. (2019) reported that pressure to reduce manufacturing costs, globalization, changing markets, and technical and technological progress press the need for manufacturing entities to improve or adopt more efficient manufacturing methods. Before the introduction of lean manufacturing (LM), traditional manufacturing systems were characterized by the waste of materials and

resources, non-value-added practices, less controlled processes, and a lack of preventive measures during the production process (Kalyar et al., 2019). Efficient manufacturing systems deliver high-quality products with the least possible manufacturing costs (Roy et al., 2018). Successful manufacturing companies have integrated sustainability into their lean practices to bolster their competitive edge and satisfy the sustainable expectations of their stakeholders (Inman & Green, 2018).

In this study, I explored the strategies U.S. managers employ to implement efficient manufacturing systems to improve their companies' performance. I collected data from interviews and available company materials. The data collected, along with findings from the extant literature, are analyzed and discussed. Through this analysis, I developed and provided suggestions for the selection of strategies to implement efficient manufacturing strategies to improve performance.

Problem Statement

Many U.S. manufacturing companies perform poorly due to their managers' unsuccessful strategies in implementing efficient manufacturing systems (Maldaner & Kreling, 2019). U.S. manufacturing managers who are not using efficient manufacturing systems negatively affect their organizational performance and the U.S. economy (Polemis et al., 2020). Manufacturing firms in the United States are responsible for 50% of U.S. exports (Polemis et al., 2020). U.S. manufacturing is the fourth largest industry in the country and employs over 15.6 million Americans and represents about 11% of the GDP (BEA, 2020). The general business problem was that some U.S. manufacturing

managers use inefficient manufacturing systems that adversely affect their companies' performance. The specific business problem was that some U.S. manufacturing managers lack strategies to implement efficient manufacturing systems to improve their companies' performance.

Purpose Statement

The purpose of this qualitative single case study was to explore the successful strategies U.S. managers employ to implement efficient manufacturing systems to improve their companies' performance. The targeted population of the study comprised six managers of a manufacturing company in Tennessee, in the southeastern part of the United States who had used successful strategies to implement efficient manufacturing systems to improve their companies' performance. The positive social change implications of this study include helping improve the economic wealth and better employment opportunities successful manufacturing companies can offer society and the possible increase in foreign investment from investors who may want to invest in U.S. manufacturing businesses if they become more successful.

Population and Sampling

The targeted population of the study comprised six managers of a manufacturing company in Tennessee, in the southeastern part of the United States, who had used successful strategies to implement efficient manufacturing systems that improved their companies' performance. Through purposive sampling, I selected managers from one company who met the study's eligibility requirements and conducted semistructured,

open-ended, face-to-face interviews with them to elicit the strategies they use to implement efficient manufacturing systems that improved their company's performance. For additional data, I also reviewed the available organizational documents of this company for relevant information, such as metrics, policies, quality, and process procedures regarding the topic of this study.

Nature of the Study

I employed the qualitative research method in this study. A researcher chooses the qualitative method because of its inductiveness and because it enables the researcher to explore what transpires in a particular period in a natural setting (Barnham, 2015; Mohajan, 2018). A qualitative researcher aiming to research an applied business problem uses the qualitative research method to explore business processes, how these processes apply to real business issues, and how people react to these processes (Mohajan, 2018). The qualitative research method was appropriate for this study because I explored management strategies, as well as manufacturing management systems and processes that managers use to improve their organizational performance.

The other research methods are quantitative and mixed-method research. The researcher majorly deals with assumptions in the quantitative research method (Barham, 2015). Edwards (2020) posited that quantitative research involves estimations, using already made formulas, and assumptions. In the mixed-method approach the researcher integrates both quantitative and qualitative methodologies to understand the topic in question (Cook et al., 2019). In the mixed-method approach, the researcher shows the

interdependence of qualitative and quantitative research methods in understanding the business problem that is being researched (Cook et al., 2019). The mixed-method approach was not the most appropriate for this doctoral study because the quantitative approach was not needed to answer the research question.

Researchers use five qualitative approaches: narrative, phenomenological, grounded, ethnographic, and case study (Valtakoski, 2020). A qualitative researcher uses a case study to explore the interpretations individuals or groups attribute to a particular real-life problem in a natural setting (Guetterman, 2018; Hollweck, 2015; Valtakoski, 2020). Mishra and Dey (2021) stated that the researcher aims to study a phenomenon within a given context in case study research. In a case study, the studied phenomenon should be within the boundaries of a matching and dedicated context of a case (Mishra & Dey, 2021). A qualitative case study researcher starts studying a phenomenon within a given context using data, then ends with a theoretical explanation of the phenomenon. I chose a single case study design because the current study involved only a single case in a single setting:the strategies that manufacturing managers at one U.S. manufacturing company employ to implement efficient manufacturing systems to improve their organizational performance.

Research Question

What strategies do U.S. manufacturing managers use to implement efficient manufacturing systems to improve their companies' performance?

Interview Questions

1. What manufacturing systems do you use to improve your company's performance?
2. What strategies do you use to implement your manufacturing systems?
3. What strategies do you think are best for implementing efficient manufacturing systems to improve your company's performance?
4. How do you measure the effectiveness of your manufacturing systems?
5. How did your employees react to your manufacturing systems?
6. What challenges did you encounter while using these manufacturing systems?
7. How did you deal with the challenges you encountered using these manufacturing systems?
8. What additional information would you like to share about the successful strategies you used to implement manufacturing systems that affected the performance of this company?

Conceptual Framework

The conceptual framework for this study was the transformational leadership theory, which was initially developed by James McGregor Burns in 1978, identifying two types of leadership styles: transactional and transformational (Islami & Mulolli, 2020; McKnight, 2013). Transactional leaders see the job as just a contract, and the employees must deliver to earn rewards, while transformational leaders tend to lead their subordinates to achieve more than the proposed targets of their company (Engelbrecht &

Samuel, 2019). Deluga (1988) found that managers who adopt effective leadership styles, such as transformational leadership, tend to influence their employees toward greater productivity.

The transformational leadership theory was a suitable framework for this study because manufacturing managers should commit to going above traditional management to inspire their employees to develop themselves while achieving more for their company (see Engelbrecht & Samuel, 2019). The aim of transformational leaders should be to lead their companies toward achieving more outstanding performances (Deluga, 1988). Transformational leadership focuses on key parameters, including trust, motivation, maximum performance, and charisma, to catalyze employee engagement and performance. (McKnight, 2013; Peng et al., 2021). This theory implies that the manager must motivate the employees to see the importance of implementing more efficient manufacturing systems to achieve a more robust company performance. For example, Engelbrecht and Samuel (2019) stated that transformational leaders indirectly influence the intention to quit through perceived organizational support, justice, and truth. In this example, the application of transformational leadership by the managers will help create an emotional commitment to agreed goals, individual consideration towards the employee, development of self-value in the organization, and employees' identification with their managers (Engelbrecht & Samuel, 2019). Transformational managers use transformational leadership to influence their employees toward innovative work behaviors (IWBs; Stanescu et al., 2020). IWBs is one of the strategies managers use to

respond to competition in this knowledge-intensive dynamic market that requires organizations to be innovative (Stanescu et al., 2020). Improved company performance should be the responsibility of all employees.

In a punctuated context, through transformational leadership, the managers and employees may learn that applying these efficient manufacturing systems will improve their organizational performance and possible profitability (Islami & Mulolli, 2020; Khan et al., 2021; McKnight, 2013). A transformational leadership framework is a platform where the leader inculcates the company's mission to the employees to promote employee engagement, and the employees, in turn, concentrate more on growth and development (Islami & Mulolli, 2020; Khan et al., 2021; McKnight, 2013). Ultimately, managers, employees, the company, and the external community are transformed through the leadership framework, and the company's performance increases while employees and managers gain promotions and knowledge.

Operational Definitions

Idealized influence: A behavioral dimension that manifests in several components, including charisma, ethical leadership, and trust, that the leader uses to influence the followers' performance (Bass & Steidlmerier, 1999; Langat et al., 2019).

Individualized consideration: The individual attention a leader gives to followers that make them feel important and valued (Khan et al., 2022; Seitz & Owens, 2021)

Inspirational motivation: The level at which the leader can inspire the followers by articulating the organizational vision in a way that appeals to the followers (Bass, 1990, 1997; Shafi et al., 2020).

Intellectual stimulation: The willingness of the leader to teach or stimulate the followers to learn and develop new skills or approaches to resolving or considering old problems (Bass, 1990).

Prevention focus: A type of focus in which leaders and organizational members stick to incremental improvements and error reduction as a reaction to urgency (Fredberg & Pregmark, 2022).

Promotion focus: A type of focus that centers on organizational growth, creative solutions, expansion, innovative ideas, stimulation of organizational citizenship, and the like (Fredberg & Pregmark, 2022).

Sustainability: Meeting today's environmental, economic, and social needs without hampering the opportunities for future generations to meet their environmental, economic, and social needs (Horak et al., 2018).

Transactional leader: A leader who bases leadership on a contingent reward and management by exception approach (Bass & Avolio, 1993; Burns, 1978).

Transforming leader: A leader who tries to understand the follower's motive and satisfies a higher goal while engaging with the follower in full (Bass, 1990; Burns, 1978).

Assumptions, Limitations, and Delimitations

Assumptions

In a study, assumptions are facts the researcher considers accurate but are not verified to be factual (Sebele-Mpofu, 2020). My assumptions for this study were (a) that participants understood the importance of their management systems in the company's performance, (b) that participants were able to answer questions based on their past experiences with their manufacturing strategies, and (c) that participants answered interview questions honestly.

Limitations

Limitations are potential study weaknesses beyond the researcher's control (Dinh, 2021). I identified two limitations to this study: (a) that participants may have provided biased or dishonest responses to interview questions and (b) my access to company data might have been limited due to company policies.

Delimitations

Delimitations are boundaries the researcher creates within the scope of the study (Yin, 2018). The delimitations within this study were my access to the organization, the geographical area of the organization, the choice of the participants, the study was conducted in only one type of manufacturing in a specific area, and the results might not be transferable to another kind of manufacturing or location. The scope of this study was focused on one specific manufacturing company in Tennessee, in the southeastern part of the United States.

Significance of the Study

The U.S. manufacturing industry accounts for over 50% of U.S. exports (Polemis et al., 2020) and is the fourth largest industry in the country (BEA, 2020). Improving the management systems of this industry could positively impact the U.S. economy, manufacturing employees, the study site's stakeholders, society, and the study site's performance and potential for profitability.

Contribution to Business Practice

Globalization, technological development, market competition, and increasing consumer expectations have challenged manufacturing managers to adopt the best strategies to improve their performance (Manikas et al., 2020). U.S. manufacturing managers could use this study's findings to choose strategies to use to strengthen their company's competitiveness. Manufacturing managers could also use the study's findings to help make strategic decisions that may result in business growth and the potential for a more robust financial performance.

Based on the results of this study, manufacturing managers may adopt strategies to help them produce the highest quality products at the lowest cost and the fastest speed as well as develop more robust manufacturing management techniques. Manufacturing managers could also use the study findings to improve their company's innovativeness and competitiveness in the global economy. Manufacturing managers must learn to adopt new technologies to thrive in the increasingly changing marketplace.

Implications for Social Change

One of the social change implications of this study is that successful businesses can positively contribute to the U.S. economy. Managers can apply this study's findings to help enhance their manufacturing strategies and improve their companies' performances. Furthermore, manufacturing companies who benefit from the results of this study may employ more Americans as their businesses become more successful, with a resultant reduction in the country's unemployment rate. Another positive social change implication of this study is that successful U.S. manufacturing companies may attract more foreign investors who find it gainful to invest in U.S. industries.

Managers who adopt the transformational leadership strategies suggested in the current study may influence their employees to develop organizational citizenship behaviors (see Engelbrecht & Samuel, 2019). The skill sets of their employees and their companies may improve as a result. One of the many positive social change implications of the current study is that employees may become more valuable to their companies as their skills are enhanced through transformational leadership; these employees may also become more competitive in the job market. Employees may enjoy improved self-worth, wealth, and satisfaction gained through their increased knowledge and skills.

The participants for this study were managers who had successfully employed strategies to implement efficient manufacturing systems that impacted their company's performance. The study findings may help managers of other companies learn better strategies to implement efficient manufacturing systems in their companies to improve

their company's performance and avoid or minimize the turnover rate and other hardships that poor manufacturing management systems have caused them. Based on the study findings, managers may improve their management skills, their employees' skills, and their company's competitiveness for business continuity, resulting in their employees retaining their jobs.

The study results also provide in-depth information on sustainability. The results show that many successful U.S. manufacturing companies included the triple-bottom line (i.e., environmental, economic, and social dimensions) in their strategic plans to satisfy their stakeholders and improve performances (see Manikas et al., 2020). Companies may use the results of this study to embark on socially, economically, and environmentally responsible programs that may help improve the quality of life and the environment of U.S. citizens and citizens around the world.

A Review of the Professional and Academic Literature

Introduction

In a literature review, the researcher aims to summarize, compare, and contrast relevant literature from which to build knowledge on this existing knowledge in their own study. For this literature review, I searched peer-reviewed journals, seminal books, and governmental reports. In this research, I searched several academic databases, such as ABI/INFORM Global, EBSCOhost, ERIC, Science, Academic Search Complete, Business Source Complete, Emerald Management, and ProQuest Central. The keyword search terms used included *transformational leadership theory, transformational*

leadership framework, manufacturing strategies, production strategies, process improvement, lean manufacturing, kaizen, transformational theory constructs, transactional leadership, manufacturing systems, motivation, job satisfaction, diversity, diversity management, sustainability, leadership, manufacturing, environmental management, green manufacturing, operations management (OM), productivity, and *implicit and explicit transformational leadership*.

In Table 1, I present the breakdown of the literature cited in this literature review section. The section comprises 155 references, including 142 (92%) that were published between 2018 and the anticipated date of completion of 2023, 13 (8%) that were published more than 5 years from the date of anticipated completion, and two (1%) non-peer-reviewed articles. The literature review is organized into the following subsections: (a) introduction, (b) conceptual framework, (c) transformational leadership, (d) transformational leadership's four behavioral dimensions, (e) related and contrasting theories, (f) implicit transformational theory, (g) transactional leadership, (h) manufacturing systems, (i) competitive advantage, (j) manufacturing strategies, (k) organizational transformation and change management, (l) diversity management, (m) innovative work behavior, (n) sustainability, (o) OM, (p) LM as OM tool, (q) LM, (r) kaizen, and (s) transition to Section 2.

Table 1

Literature Review Statistics

References cited	2018				Totals	
	Newer (count)	Newer (%)	Older (count)	Older (%)	Count	%
Peer reviewed	140	90.32	13	8.39	153	98.71
Other	2	1.29	0	0.00	2	1.29
Totals	142	91.61	13	8.39	155	100.00

Note. The articles referred in this table are articles written since 2018 and those written before 2018.

Conceptual Framework

Transformational leadership has been widely researched in the field even though it is in a consistent mode of evolution. Researchers have proposed the application of transformational leadership in many aspects of both the public and private sectors of leadership. Lo et al. (2020) credited the origin of the transformational leadership framework to the 1973 work of the socialist, James V. Downton. The gaps in this framework have allowed various scholars and researchers to develop multiple similar and contrasting meanings in transformational leadership. Downton, Burns, Bass, and Avalio are some of the notable contributors. The transformational leadership framework has gradually evolved and is still evolving, and there is a need for even more progression of

this framework. For instance, there is a need to more directly research the influence and measurement of transformational leadership on manufacturing strategy choice.

Transformational Leadership

The conceptual framework for this qualitative case study was centered on transformational leadership theory. Burns (1978) introduced the concept of a transforming leader. Great leaders are transformational because they can change their followers' motives and align them to the goals of their organizations; therefore, leaders should act as the agents of their followers (Demirtas et al., 2020; Siangchokyoo et al., 2020). Burns emphasized that leadership rarely fulfills the needs set, and the reason for unfulfillment in leadership is the mediocrity that plagues many leaders who do not understand the purpose of leadership and why they are in leadership. In Bruns's opinion, leadership can be separated into two groups: transactional and transforming (i.e., transformational). According to Burns, most leaders practice transactional leadership; they approach their followers by exchanging one thing for another. Leaders are supposed to be the catalysts of change that lead, equip, and transform their organizational members into change agents that take their organizations to outstanding performances (Siangchokyoo et al., 2020).

Alatawi (2017) defined transformational leadership as a process where a manager stands to change the organization's culture by first identifying issues that hamper transformation and then trying to improve or alter the organization's original vision and proffering a new vision. Even though complex, transformational leadership is very potent

because the leader identifies and tries to explore the current need and demands of the leader's potential followers (Burns, 1978; Siangchokyoo et al., 2020). A transforming leader does not just exchange something for another with the follower; instead, a transforming leader tries to understand the follower's motive and satisfies a higher goal while engaging with the follower in full (Bass, 1990; Burns, 1978). Burns (1978) identified characteristics of a transforming leader as the stimulation of mutual relationships, an elevation that converts followers into leaders, and the conversion of leaders into moral agents. The last attribute above enables the leader and the follower to have a relationship in which both the mutual aspirations and values of the the leader and follower are shared. Being a moral agent also enables leaders to be responsible for their commitments. In the lens of a manufacturing company, this kind of leader is committed to developing the followers and achieving meaningful organizational performance (Islami & Mulolli, 2020). As a moral agent, the transforming leader commits to the followers in three things: fundamental wants and needs, aspirations, and values (Burns, 1978). This kind of leadership will stimulate social change to meet the followers' authentic needs. In a concise sense, transformational leaders tend to create valuable and positive change in their followers, thereby developing followers into leaders (Burns, 1978).

Transformational leaders influence their employees through motivation and commitment to improving their companies' performance (Bass, 1990; Bass & Avalio, 1993; Islami & Mulolli, 2020). Transforming the followers is the foundation of transformational leadership, and organizational performance is influenced by how much a

transformational leader can transform their followers (Demirtas et al., 2020; Menges et al., 2011; Siangchokyoo et al., 2020). In other words, the leader must possess transformational characteristics, such as self-determination, motivation, and a focus on high performance (Hansbrough & Schyns, 2018; McKnight, 2013). Such a leader helps the employees see value in their job rather than thinking of their jobs and roles as boring and insignificant (Demirtas et al., 2020). This type of leader must be able to transform their followers to achieve more than the desired outcome for the organization as well as to exceed the goals of the leaders and followers by motivating, encouraging, and empowering followers to improve their skills and performances (Bak et al., 2022; Chin et al., 2019).

Demirtas et al. (2022) stated that every leader or manager aims to achieve organizational success, but a good leader understands that employees are instrumental to the organization's success. When employees are inspired to know that the company's success is in their hands, they tend to put in more effort (Bak et al., 2022; Demirtas et al., 2020). Bak et al. (2022) stated that leaders who treat their employees as essential stakeholders can motivate them to exceed their organizational goals, and such employees tend to see their companies' good performance as their responsibility. A transformational leader intends to develop the employees who, in turn, improve the company (Islami & Mulolli, 2020). Transformational leaders transform employees by motivating them to change their behaviors and attitudes and inspiring them to believe in the organization's mission, purpose, and values (Bak et al., 2022, Chin et al., 2019; McKnight, 2013).

However, the followers' perspective of the leader plays a critical role in determining the success of their leaders; therefore, the leader's character and ideas must appeal to the followers to influence them.

Transformational Leadership's Four Behavioral Dimensions

Bass's (1990, 1997) additions to Bruns's transformational leadership theory introduced how transformational leadership can be measured and its impact on the followers' motivation and performance (Langat et al., 2019; Seitz & Owens, 2021). Researchers have found that transformational leadership profoundly transforms followers beyond their behaviors (Seitz & Owens, 2021). According to Seitz and Owens (2021), a field experiment on managers showed that managers who underwent transformational leadership training influenced their followers' development more than managers who underwent general leadership training. The areas this development affected were motivation, morality, and empowerment. The degree of transformationalism is measured by the influence of such a leader on the followers (Seitz & Owens, 2021).

Burns (1978) emphasized that transformational leadership is not based on a contingent reward relationship; instead, it is based on the abilities and characters of the leader that enable the leader to influence the followers. The aim of a transformational or a good leader is to use their abilities, such as integration of creative insight, sensitivity to the needs of the followers, persistence, and conversion of followers to organizational citizens, to forge the organization's strategy-culture alloy (Bass & Avolio, 1993; Eker & Eker, 2019). The leader must navigate among the factors affecting the business and the

organization's members to improve the organization's performance (Eker & Eker, 2019). The features found among transformational leaders help transform organizational members from mere workers to highly engaged, committed, emotionally intelligent, and concerned members of the organization (Bass, 1990; Burns, 1978; Jain & Duggal, 2018). Researchers discovered the influence of a transformational leader on the employees' intention to quit through the leader's perceived organizational support, justice, and truth (Engelbrecht & Samuel, 2019). In other words, transformational leadership significantly decreases the employee's intention to quit because a transformational leader transforms followers by achieving an emotional commitment to agreed goals, individual consideration towards the employee, developing self-value in the organization, and employees' identification with their leader (Engelbrecht & Samuel, 2019; Langat et al., 2019).

In 1985, Bass (1990, 1997) developed a transformational leadership construct that consists of four behavioral dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Avolio,1993; Seitz & Owens, 2021). These four dimensions or factors refer to how followers view the leader as well as the behavioral dimensions the leader uses to affect the development of the followers (Bass, 1990, 1997; Seitz & Owens, 2021). Instead of the term transforming, as used by Burns in 1978, Bass used transformational in 1985. Bass (1985, 1990, 1997) extended the works of Burns by revealing the psychological undertone of transformational and transactional leadership.

Idealized Influence

Langat et al. (2019) emphasized that a transformational leader's idealized influence behavioral dimension manifests in several components, including charisma, ethical leadership, and trust, and the leader uses these components to influence the followers' performances. Bass (1990) interpreted idealized influence as charisma (Bass & Steidlmerier, 1999). Charisma is critical to the success of any transformational leader because followers trust, value, and are motivated by charismatic leaders (Bass, 1990, 1997; Bass & Avolio, 1993; Langat et al., 2019). Idealized influence increases the followers' trust and value for their leaders (Afshari, 2022; Langat et al., 2019) and increases the leader's emotional influence over the followers (Langat et al., 2019). Leaders with idealized influence gain respect from their followers because followers are motivated and inspired by their leaders' articulation of the organizational goals and their determination to achieve them (Afshari, 2022). In a concise sense, Demirtas et al. (2020) expressed that this element of transformational leadership encourages the followers to view their leaders as role models, adopt the role model's characteristics, and have confidence in themselves to make the right decisions that positively affect the collective goals of the organization.

Transformational leaders may change organizational culture to achieve operational excellence, employee commitment, and improved organizational performance, and the idealized influence of the leader is critical to achieving these goals (Afshari, 2022; Bass & Avolio, 1993; Langat et al., 2021). Afshari (2022) expressed that

idealized influence is relationship oriented, and the leader-follower relationship is critical regarding employee commitment and perception of the leader. Employee and organizational performances increase when employees identify that their leaders possess the idealized influence behavioral dimension (Afshari, 2022; Langat et al., 2021). Researchers have proven that idealized influence is associated with job performance (Langat et al., 2021) and employee commitment (Afshari, 2022). Leaders display idealized influence when they act as role models by displaying ethical behaviors (Langat et al., 2021). In this way, the adherent's confidence in the leader increases, transforming the adherent's self-concept and self-esteem toward identifying with the leader. When the followers align with the organization's visions through the lens of their leader's influence, followers tend to put extra effort into achieving organizational goals led by their leader (Langat et al., 2021).

Inspirational Motivation

Inspirational motivation is the level at which the leader can inspire the followers by articulating the organizational vision in a way that appeals to the followers (Bass, 1990, 1997; Shafi et al., 2020). A transformational leader provides meaning to the current task and induces optimism about future goals by motivating followers to commit to high standards (Bass, 1990, 1997; Chin et al., 2019). Shafi et al. (2020) emphasized that transformational leaders constantly devise ways to spark their employees' creativity and organizational innovation to meet the dynamic and challenging market. Employees' confidence and value increase because of the inspirational motivation dimension of

transformational leaders, hence increasing the performance outcome of the employees beyond their initial expectations (Chua & Ayoko, 2021; Shafi et al., 2020). Through inspirational motivation, the leader instills confidence, autonomy, commitment, and assurance in the followers, inspiring them to achieve the assigned goals (Bass, 1997; Khan et al., 2022; Shafi et al., 2020). Inspirational motivation increases employees' work commitment and engagement, leading to self-determination and job satisfaction (Chua & Ayoko, 2021).

The leader's emotional support encourages the followers to improve their skills and, in turn, organizational performance (Khan et al., 2022; Shafi et al., 2020). For example, Shafi et al. (2020) explained that when employees are inspired and motivated by their leaders, they devote more time to the organization and, as a result, increase productivity. Followers build a mental image of the future, being mentally ready to face challenging situations. Transformational leaders transform their followers by stirring up enthusiasm, team spirit, and a creative mindset in their followers (Khan et al., 2022). Demirtas et al. (2020) suggested that employees are motivated even more when they see their perceived meaningfulness contribute to or cause a meaningful organizational transformation. In this aspect, the employee's interaction with work and the work environment leads to meaningfulness. Meaningfulness becomes very eminent to the employee when the employee's perception positively impacts work (Demirtas et al., 2020).

Intellectual Stimulation

One of the characteristics of transformational leaders is encouraging their subordinates to think independently (Seitz & Owens, 2021). Transformational leaders tend to develop their followers to be rational and think independently instead of always depending on the leader's ideas (Demirtas et al., 2020). In other words, transformational leaders charge their subordinates to create their own opinions and thoughts on issues in their work environments. Bass (1990) expressed that, as the third factor of transformational leadership, intellectual stimulation is the willingness of the leader to teach or stimulate the followers to learn and develop new skills or approaches to resolving or considering old problems. This way, the followers know how to approach problems rationally and analytically. These followers are motivated to see challenges as opportunities to solve another problem (Bass, 1990).

Endrejat (2021) argued that supervisors are not always the experts, which is why they motivate followers to utilize their skills and think of new ways of solving problems. Employees should be allowed to question the status quo to enable a balanced system in the organization. Intellectual stimulation is a critical leadership factor that helps the organization empower its employees to develop new ideas, especially in a low-innovative organization (Endrejat, 2021). Intellectually stimulating leaders encourage problem reformation, intellectual curiosity, questioning assumptions, and challenging actions that may affect performance (Thuan, 2020). This factor stimulates followers to take their jobs

as necessary, encourages individual creativity, facilitates employee intrinsic motivation, and develops better ideas for products and processes (Endrejat, 2021; Thuan, 2020).

Individualized Consideration

This behavioral dimension of individualized consideration is the individual attention a leader gives to followers that make them feel important and valued (Khan et al., 2022; Seitz & Owens, 2021). A transformational leader achieves this dimension by acting as a personal coach, mentor, or trainer to each follower. In other words, this manager or leader treats, coaches, advises, or mentors each follower individually (Bass, 1990, 1997; Seitz & Owens, 2021). Followers are exposed to new learnings, thereby improving their skills.

The leader achieves this by focusing on what the followers value, then extending kindness by helping the followers achieve these aims (Khan et al., 2022; Seitz & Owens, 2021). Leaders motivate their followers by assisting them in reaching their full potential, including attaining higher positions and skills (Bass, 1990, 1997; Khan et al., 2022). The followers develop trust and confidence in this kind of leader and consequently feel esteemed and respected. The managers or leaders are confident in their follower's abilities and skills to allow delegation, two-way communication, and one-on-one relationship with their followers (Bass, 1990, 1997; Khan et al., 2022).

Related and Contrasting Theories

The implicit transformational theory provides another perspective of transformational leadership: the leader’s rating or success is based on the follower's view,

evaluation, and response to the leader (Hansbrough & Schyns, 2018). Implicit leadership theories influence how people view and accept others as leaders because individuals develop a mental image of what leaders should be (Petrus, 2018; McClellan et al., 2020). Unlike transformational leadership, transactional leadership is where leaders base their leadership on a contingent reward system. Transformational leaders influence their followers through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, while transactional leaders reward followers for good performance and penalize followers for poor performance (Bass, 1990, 1997; Khan et al., 2022).

Implicit Transformational Theory

Eden and Leviatan constructed the term implicit leadership theories in 1975, positing that the followers build a mental model of their expectations of an ideal leader (Petrus, 2018). Implicit leadership theories influence the relationship between the leader and the followers because followers accept or reject the leader and his ideas based on the followers' prototype of what the leader should be (Khorakian & Sharifirad, 2019; McClellan et al., 2020). Petrus (2018) reported that leaders and followers are categorized based on the perceivers' cognitive schemas in implicit leadership theories.

The influence of implicit leadership controlled by the perceivers' cognitive schema can manifest in leader-follower exchange, organizational commitment, and job satisfaction (Petrus, 2018). Since the followers judge their leaders based on their social cognitive schema, these unrealistic expectations could affect their perceptions of the work

environment, job attitudes, and performance (Khorakian & Sharifirad, 2019). Followers associate certain traits with their ideal leader, not based on what a typical leader should be (Hansbrough & Schyns, 2018; Khorakian & Sharifirad, 2019). Such characteristics include sensitivity, charisma, devotion, intelligence, persistence, and the like. Followers trust leaders who fit closely to the followers' mental frameworks of a typical leader. The trait individuals associate with their ideal leaders is primarily reflective of the individuals' self-concepts based on their behavioral patterns (Hansbrough & Schyns, 2018).

In explicit leadership theories like transformational, transactional, and charismatic leadership, researchers and scientists use data from scientific studies to determine the characteristics of a leader. In contrast, followers determine the characteristics of their leaders in their minds in implicit leadership theory (Khorakian & Sharifirad, 2019). Leaders with features that closely match the expectations of their followers can influence and motivate them. The extent of the closeness of these characteristics determines the leader's power (Khorakian & Sharifirad, 2019). Charisma, intelligence, and sensitivity are traits associated with transformational leaders (Bak et al., 2022; Hansbrough & Schyns, 2018; Seitz & Owens, 2021). These traits make it more natural for transformational leaders to transform their followers.

Researchers found that implicit transformational leadership theory associated sensitivity, charisma, dedication, and intelligence with transformational leaders and their followers (Hansbrough & Schyns, 2018; Khorakian & Sharifirad, 2019). Leaders who are

sensitive or empathic to their followers' needs are likely to appeal to followers who consider sensitive leaders ideal (Hansbrough & Schyns, 2018). Charismatic leaders are energetic, enthusiastic, sociable, extroverted, and confident. Therefore, charismatic leaders will always appeal to followers who believe an ideal leader should be charismatic. Transformational leaders are generally viewed as being dedicated. Dedicated leaders are also known to be hard-working, focused, and performance driven. It is most likely that dedicated leaders will appeal to followers who believe that their ideal leader should be dedicated (Hansbrough & Schyns, 2018). The fourth trait generally associated with implicit transformational leadership is intelligence. Intelligent leaders are clever, creative, and knowledgeable (Hansbrough & Schyns, 2018). This trait makes transformational leader encourage their followers to be innovative. Likewise, this kind of leader will appeal to followers who define their ideal leader as intelligent.

Transactional Leadership

Burns (1978) differentiated between transactional and transformational leaders. Transactional leaders, unlike transformational leaders, base their leadership on a contingent reward and management by exception approach (Bass & Avolio, 1993; Burns, 1978). Two behavioral dimensions shape transactional leadership: (a) the leader sets goals and rewards employees based on their performance concerning the set goals, and (b) the leader continually monitors the performances of the employees and consequently reacts to any deviation from the set goal (Berkovich & Eyal, 2021). Transactional leaders work within the context of the organization’s existing culture and base their actions or

leadership on the norms and procedures of the organization (Bass & Avolio, 1993; Burns, 1978). In other words, they lead their followers to maintain the existing goals and vision of the organization: they do so by exchanging rewards for work done by the followers. They explain the job requirements and the compensation the followers will gain if the job requirement is achieved (Bass, 1990). Transactional leaders promote rewards for exceptional jobs and punishment for poor performance. These leaders do not align their followers around the organization's vision or try to modify or improve the organizational vision like transformational leaders (Bass & Avolio, 1993). Transactional leaders differ from transformational leaders because, unlike transformational leaders, they maintain the status quo instead of fostering a culture of creative change, as Bass and Avolio (1993) suggested.

Bass (1990) explained that transactional leaders achieve goals by focusing on two factors, namely (a) focusing on accomplishing the job at hand by initiating and organizing the work and; (b) focusing on satisfying the self-interest of those who accomplished the job or performed well by promoting, pay increase, compensating, or recognizing them. Those who fail to fulfill tasks are penalized for their failures. Even though this kind of leader gets the job done, such a leader does not promote individual development to stimulate organizational growth and performance. In contrast with transformational leadership, transactional leaders exchange compensation, carrier advancement, pay increase, or promotion for good performance and penalty for poor performance: a transaction between managers and employees (Bass, 1990; Bass &

Avolio, 1993). Managers who apply transactional leadership tend to keep their companies at a standstill because they need to be more proactively interested in improving and developing their employees or sparking individual or organizational innovation (Bass, 1990). This kind of leader will eventually be phased out because this leadership style has been proven counterproductive or ineffective (Bass, 1990).

Manufacturing Systems

Manufacturing continuously undergoes reformation in the United States and the world due to its significance in the United States and the world's economy. Manufacturing companies are always looking for more efficient ways of redesigning and improving their systems (Maganha et al., 2019). Maganha et al. (2019) stated that the manufacturing industry faces challenges from global competition, product customization, constant product redesign, inflation, environmental regulations, increasing technological changes, and the like. Therefore, manufacturing countries and companies constantly change their manufacturing systems to help them cope with these challenges. Dohale et al. (2022) defined manufacturing as converting raw materials into tangible goods. Manufacturing is achieved using the four basic manufacturing systems: a job shop, batch shop, mass or assembly line, and continuous flow, depending on the desired output level (Dohale et al., 2022).

The level at which the output is generated, such as cost, quality, delivery, and flexibility, is determined by the process choice or production system utilized, making process choice a vital competitive factor. A good selection of process choices can

translate into a substantial competitive advantage, thereby improving the organization's performance (Dohale et al., 2022). Manufacturing firms need to choose efficient manufacturing systems because a wrong process choice can cause the firm to produce a different output level, causing them to invest capital in the wrong manufacturing system, reducing the organization’s performance and losing competitive advantage.

Many companies are leaving conventional manufacturing systems for more efficient and robust systems with quick responsiveness to help them achieve faster product lunch, customization, and mix to meet the increasing and challenging demands in quality and quantity (Dohale et al., 2022). The idea is to make the most quality and safe products in the shortest period safely and efficiently while maintaining the lowest manufacturing costs (Liu et al., 2022; Maganha et al., 2019). Dedicated manufacturing lines and flexible manufacturing systems were considered the best systems before the 21st century. Automation is not new in dedicated manufacturing lines or manufacturing. It dates to 1913 when the invention of moving assembly lines was accredited to Henry Ford. Dedicated manufacturing lines allowed for the mass production of a single product at the least cost (Maganha et al., 2019).

Before and in the 1990s, flexible systems such as cellular manufacturing and seru production systems were the most suitable because of their flexibility (Deep, 2022; Liu et al., 2022). The increase in product variation, customization, market uncertainty, and technological changes have proven the need to move from flexible manufacturing to reconfigurable manufacturing (Khanna & Kumar, 2019; Maganha et al., 2019). For

instance, in cellular manufacturing systems, any fluctuation in product or production affects manufacturing adversely (Mansour et al., 2022). Managers use reconfigurable manufacturing systems to solve problems created by changing markets and other fluctuations, making it possible to achieve more with single machines (Maganha et al., 2019).

More complex and robust systems, such as smart production systems, have been discovered in trying to eliminate so much human involvement in manufacturing (Alavian et al., 2020). Smart production systems can autonomously diagnose and design optimal continuous improvements to improve productivity (Alavian et al., 2020). Prominent businesses are now going to even more robust systems like Industry 4.0 (I4.0), which transforms manufacturing from machine dominant to digital (Oztemel & Gursev, 2020). Over the years, manufacturing has metamorphosed, and researchers and practitioners have used industrial revolutions to mark the trends in manufacturing. As the trends change, the manufacturing systems change to accommodate the challenges that come with each revolution. The core reasons for these transformations are gaining a competitive advantage, improving performance, and increasing profitability.

Cellular Manufacturing Systems

In cellular manufacturing systems (CMS), parts are grouped in a cell according to part types using group technology principles (Deep, 2022; Mansour et al., 2022). Mansour et al. (2022) explained that group technology, originally developed and enhanced by Mitranov in 1959 and Burbidge in 1971, respectively, is a principle used in

grouping parts similarly based on dedicated machine cells or manufacturing processes. A part family is produced in one cell with a dedicated set of machines or a machine to decrease throughput time, lead times, and inventory.

The design of a CMS comprises three interdependent steps: forming part families by considering their processing requirements, forming machine cells, and assigning the part families to machine cells (Deep, 2022). Mansour et al. (2022) posited that CMS depends on three factors: machines, parts, and workers. Cell formation problem is composed when machines and parts form part families and machine cells; this is the bases for the design of CMS (Deep, 2022). Deep and Mansour et al. suggested that even though machines and parts form the bases for cell formation problems in CMS, operators play a critical role in CMS's successful execution, making human resource management crucial in CMS. Operator performance must be monitored and measured for optimum efficiency in CMS. The primary issue with CMS is that any product or production fluctuation affects the cell and may also affect other cells related to or relying on the affected cell upstream or downstream, mainly because of the difficulty in establishing these cells independently (Mansour et al., 2022). Furthermore, there may be material flow issues due to the dependency of the cells on each other stemming from intra and inter-cellular arrangements of the machines. Layout design is very vital in minimizing such problems and optimizing benefits.

Seru Production Systems

Before the mid-1990s, Japanese companies used the Toyota production system (TPS) as a significant manufacturing system in their plants (Shih, 2021). Like every other system, TPS was ineffective in responding to product and operator unstable conditions such as short product cycles, product volume uncertainty, and other production fluctuations such as unexpected machine breakdown, low-performing operators, and unknown product profiles requiring additional operator training (Shih, 2021). TPS is efficient in production with stable volumes (Liu et al., 2022). The increase in market volatility, product mix, and the search for a manufacturing system with a swifter response to these variations in product and production led to the development of a new system called the seru production system in 1992. Seru originated from Sony and became widely used in Japanese companies. Seru is a Japanese word for cell (Shih, 2021). Seru production system is not just a manufacturing system; it is an OM tool used to manage labor and reduce production costs.

Seru production system gained more ground because it responded rapidly to product variation and other production fluctuations. Unlike the traditional cellular manufacturing system, seru or cell production focuses more on simplifying the human resource system and machine mobility (Liu et al., 2022; Shih, 202; Tang & Wang, 2022). In the traditional cellular system, the movement or relocation of machines is complex, and operators are stationed in one cell. In cell production, the employees are encouraged to develop competencies in multiple cells rather than knowing how to run just one cell or

line. The seru system brought production flexibility in operator training and transport in workstations for a swift response to the production challenges such as product variability and employee performance fluctuations. According to Shih (2021), the seru system is U-shaped, making it possible to practice the unitary flow of materials and use multifunctional workers to execute activities.

Liu et al. (2022) and Shih (2021) listed the three types of seru production systems as divisional, rotational, and yatai. One or more operators work in divisional serus and perform one or more operations in each cell. The operators are cross-trained and work together to get production done. One or more operators work in rotational serus, and each operator performs all the cell operations. In yatai, the cell is staffed with one operator in one cell, and this employee is responsible for every operation in this seru. Liu et al. noted that the most notable demerit of the seru system is that it is not beneficial in every production. The implementation of seru warrants that the cell designer understands which type of seru works in each situation because seru is situation-dependent (Liu et al., 2022; Shih, 2021). One of the most outstanding merits of seru is converting an assembly line with multiple workers into an assembly line with fewer workers (Tang & Wang, 2022).

TPS

Taiichi Ohno and his colleagues introduced the TPS in the quest for better competitive advantage and improved organizational performance in the 1950s within Toyota (Naciri et al., (2022), even though the TPS became popular after people noticed that Toyota recovered quickly from the oil crisis owing to its robust production system

based on cost reduction through the elimination of waste and full utilization of workers' capabilities in the 1970s (Lander & Liker, 2007). According to Hailu et al. (2018), the TPS is a manufacturing system that focuses on reducing waste from the time customer's order is placed to the delivery of the order to the customer. TPS's ideology is to make the most quality parts in the shortest period with the least cost from when the order is received from the customer to when it is delivered. In setting up TPS, leaders aim to eliminate lead times and unnecessary waste using other TPS tools such as just-in-time (JIT), lean, kaizen, jidoka, and the like (Arumugam et al., 2022).

Naciri et al. (2022) reflected on the four principles of TPS: (a) application of heijunka, a scheduling system whose principle is simple and repetitive work in a smooth production by volume or product mix; (b) in-depth practice of kaizen, the key of the TPS, which is continuous improvement involving all employees without drastic reform; (c) the stability of the, manpower, method, machine, and material, to improve the performance of the company; and (d) implementation of standardization of all the most reliable practices, steps of each process, and the tasks of each employee. According to Hailu et al. (2018) and Naciri et al., the two main pillars of TPS are JIT and jidoka or empowerment (automation with human involvement). Lander and Liker (2007) expressed that the leaders who utilize TPS achieve cost reduction through just-in-time and jidoka. One of the main focuses of JIT is inventory control at each production level, ensuring problems are discovered faster during production processes. JIT comprising continuous flow, end-to-to-end production, and production on demand, is used to eliminate wastes such as

overproduction. Providing the right amount of materials to produce at the right time at each production level is one of the philosophies behind JIT (Singh & Singh, 2020). The jidoka principle ensures that the parts are produced with the best quality. In Jidoka, TPS leaders use automation to make it possible to quickly see quality issues at each production level quickly enough to correct them (Arumugam et al., 2022).

Hailu et al. (2018) expressed that TPS is challenging to implement because companies must undergo a total revolution to implement TPS successfully. The TPS philosophy works best when all the TPS tools are used together. A successful application of TPS may lead to improved performance and other organizational benefits. The philosophy entails all employees working together in each company's function to deliver the most quality product to the customer in the shortest period (Hailu et al., 2018). TPS involves every worker in every process. The TPS processes always employ continuous improvement of all process levels. TPS achieves full utilization of workers' capabilities through maximum respect for the workers by ensuring they participate during the implementation as essential stakeholders, eliminating unnecessary movement of the workers during processes, and ensuring their safety at every level of the production process (Arumugam et al., 2022; Lander & Liker, 2007). Naciri et al. (2022) expressed that the whole principle of the two pillars of the TPS is to eliminate every muda (Japanese word translated as waste) or non-value-added activity throughout the production process. The most popular mudas, according to Naciri et al., are overproduction, defective products, waiting times, transport, stocks, human movements,

unnecessary operations, and human exploitation. The concept of lean as a powerful and most worldwide utilized manufacturing system was born thirteen years after the TPS concept (Lander & Liker, 2007).

LM

The search for better ways to gain more efficiency, profit, competitive advantages, sustainability, and effectiveness in manufacturing has led to the development of many manufacturing approaches (Arumugam et al., 2022). As the nation's growth engine, the U.S. manufacturing leaders are continuously under pressure to develop more innovative products and processes, overcome market volatility and competition, introduce better strategies, reduce waste in manufacturing, improve product and service quality, and improve leadership qualities to overcome the global and market challenges facing them (Ojha, 2022). Manufacturing added $2,768.0 billion to the U.S. GDP in the second quarter of 2022 (BEA, 2022). Practitioners and researchers agree that the manufacturing industry will continue to metamorphose faster, creating a pressing need to pursue more transformational approaches such as lean manufacturing systems implementation (Ojha, 2022). LM practices have been linked to manufacturing success and have improved organizational and operational competitiveness and performance for decades (Bai et al., 2019).

LM is based on the TPS, which was initially used in the Toyota company in the 1950s in Japan mainly to improve operational efficiency by reducing costs in the form of JIT (Chen et al., 2019). Originally, JIT practices for improved quality and delivery time

were the most established form of LM (Bai, 2019). Ojha (2022) expressed that a successful LM implementation leads to better competitive advantage, the company's sustainability, and performance improvement. LM has gained ground worldwide in the last few decades, including in the United States. The word *lean* was first introduced in the United States in the 1980s at the Massachusetts Institute of Technology within the International Motor Vehicle Program (Chen et al., 2019). Since then, U.S. manufacturing experienced many manufacturing approaches based on lean principles. The two main lean principles are continuous flow and people development, and the two pillars of TPS are JIT and automation (Arumugam et al., 2022). These two pillars of TPS are the roots of the two lean principles. Leaders use JIT to achieve zero inventory through a flow system that ensures the right parts at the right time and in the required quantity. Researchers established that the people aspect of lean is essential (Arumugam et al., 2022). In 1951, Trist and Bamforth identified that the technical system includes equipment, tools, techniques, and processes, while the social system includes people and their working relationships in the socio-technical system theory (Arumugam et al., 2022). Social and technical systems complement each other; improving one system creates the need to enhance the other.

Many lean manufacturing techniques have been proven to improve the three essential elements of manufacturing, namely, product, process, and systems (Kumar, 2022; Ojha, 2022). According to Bai et al. (2019), lean manufacturing practices are lumped into practices such as JIT, total quality management (TQM), total preventive

maintenance, human resource management, controlled processes, productive maintenance, and involved processes even though Kovacs et al. (2020) showed that lean practices are grouped into four lean bundles, namely, JIT, Toyota preventive maintenance, TQM, and human resource management. LM involves the supply chain collaboration, involving the supply chain in the planning, designing, problem-solving, and developing of products to improve performance. This collaboration should include backward coordination with suppliers and forward coordination with customers in the supply chain to ensure efficient and effective design, production, packaging, and delivery of quality products to meet the operational and environmental goals for improved organizational performance (Bai et al., 2019). These goals include eliminating manufacturing waste, achieving the business' environmental, economic, and social dimensions, and better competitive advantage. Other operational and environmental objectives in today's business environment include achieving lean and green supply chain management performance and sustainable and socially responsible business practices (Bai et al., 2019).

Just-In-Time.

JIT is a TPS intended for optimizing manufacturing efficiency by improving lead time through waste elimination, minimizing inventory, increasing quality and efficiency, reducing costs, and improving communication and throughput (Chen et al., 2019; Singh & Singh, 2020). Lander and Liker (2007) posited that JIT comprises three manufacturing tools: pull systems, one-piece flow, and leveling. Companies use the JIT pull system to

achieve minimal setup and inventory (Chiarini, 2017). Manufacturing managers use a pull system to pace production to customer demand. In a pull system, finished products are shipped to the customer immediately without leaving any in the warehouse (Chiarini, 2017; Lander & Liker, 2007). A pull system is more effective when the processes of making the parts involve short setups; longer setups will warrant the use of a push system where production is scheduled ahead, increasing inventory and work-in-progress (Chiarini, 2017).

Singh and Singh (2020) reported that the JIT production system only allows for the movement and processing of materials and goods in small batches just as needed while improving workers' participation with a positive attitude, management attitudes toward workers, and relationships with suppliers and customers. It is a Japanese management philosophy that utilizes a strategy that requires the availability of the right quality and quantity of items at the right time in the right place. The principle is to ensure that final product demand is met just in time to satisfy the customer and increase competitive advantage and manufacturing speed over competitors, especially in today's environment where modern manufacturing organizations demand fast delivery and quality of the product (Singh & Singh, 2020).

JIT is effective when implemented with other manufacturing techniques at all levels of manufacturing to eliminate waste, increase the quality of products, and satisfy customers. When JIT is implemented with other lean tools, subassembly components are produced just in time; these components are assembled into subassemblies just in time,

subassemblies are assembled into finished goods just in time, and finished goods are delivered to customers just in time (Sigh & Singh, 2020). Various research conducted in several small manufacturing enterprises in the Indian manufacturing industry indicated that even a partial implementation of JIT with other lean tools resulted in increased overall equipment effectiveness (OEE), productivity, and on-time delivery, and reduced machine downtime, rejection rate, inventory, and cost (Yadav et al., 2019). Improving time delivery requires continuous improvement; JIT can influence strategic manufacturing performance improvement (Sigh & Singh, 2020).

Since the introduction of JIT manufacturing, JIT purchasing, JIT-selling, and JIT information emerged, and research has proven that JIT firms significantly perform better than their counterparts (Bond et al., 2020). Ohno proposed JIT production in 1988 and posited that allowing the shop floor to decide whether and when to stop production lines would improve performance (Arai, 2021). Arai (2021) reported that JIT production supports delegating authority to the shop floor to enhance multi-tasking and lean manufacturing.

Industrial Revolution and Industry 4.0

Manufacturing companies face the challenges of producing quality goods at competitive prices, developing efficient and automated processes, reducing delivery times, and customizing their products to survive in this turbulent economy (Zheng et al., 2021). The first three industrial revolutions utilized mechanization, electricity, and information technology to increase productivity (Cohen et al., 2019; Zauskova et al.,

2022; Zheng et al., 2021). Machines, and areas such as the textile industry, agriculture, mining, glass production, transport, and the like, were introduced and boomed in the first revolution (Yelles-Chaouche et al., 2021; Zauskova et al., 2022). The second revolution, dated from 1870 to 1914, was marked by the expansion of electricity, oil, and steel, booming the transport industry with the emergence of rail transport (Zauskova et al., 2022). Zauskova et al. (2022) emphasized that the third industrial revolution was marked by economic development through the introduction of the internet, microelectronics, and the concept of electronics which subsequently led to the application of information and technologies in production.

In the fourth industrial revolution, I4.0, the traditional processes with the internet, information, and communication technologies emerged (Cohen et al., 2019). The fourth industrial revolution, also called the digital technology revolution, was dated to 2011 and developed from the second industrial revolution by merging physical components with digital technologies (Zauskova et al., 2022). Zheng et al. (2021) stated that mass production of highly customized products became possible in I4.0 by turning production systems modular and changeable with the help of cyber-physical systems. I4.0 is a new generation of smart factories based on the digitization of manufacturing and assembly processes (Cohen et al., 2019; Zheng et al., 2021). Smart factories of the I4.0 era are marked by increased production flexibility. This allows for easy reconfiguration of machines to produce profitable products in batches as small as a unique item. The process of I4.0 enables smart companies to effectively manufacture high volumes of personalized

products that meet the quality and quantity requirements of the customers. Cohen et al. (2019) stated that I4.0 has been adopted and used in many parts of the world, industries, and companies in response to globalization and other market challenges, including competition.

I4.0 features the proper flexibility; namely, the use of one machine or means to achieve various processes, the ability to produce multiple products with one machine to boost competitive advantage, the ability to engage with the customer and other external stakeholders from the beginning of the new product development phase, and easy accessibility of data and valuable information (Cohen et al., 2019; Zheng et al., 2021). Researchers showed that many business leaders in developed and developing countries are adopting I4.0 to enhance their competitiveness in this dynamic digital and global environment (Zheng et al., 2021). Digitalization involves developing and integrating digital technologies in all aspects of the business function and activities, such as the company's products and internal and external activities (Björkdahl, 2020).

To this effect, Cohen et al. (2019) and Zauskova et al. (2022) emphasized that manufacturing companies must learn to advance their technologies to meet up in this global and digital economy. Björkdahl (2020) posited that most top leaders of companies spend most of their time, in recent times, trying to understand how to incorporate digitalization into their businesses. Consequently, many leading manufacturing companies set aside a mega part of their annual budget to digitalize various functions of their companies. I4.0 enhances human resource management, product development,

customer relations, technological advancement, and managerial and organizational performances (Cohen et al., 2019; Zauskova et al., 2022). There is an obvious need for manufacturing companies to prioritize technology innovation because it positively affects the firm's competitiveness and performance (Zauskova et al., 2022). Manufacturing companies must adjust or advance their manufacturing systems and strategies to enhance their performance because studies have proven that most stakeholders favor companies with outstanding performances.

Competitive Advantage

Hubel (2022) expressed that organizations must timely transform to be simultaneously sustainable and competitive by adopting innovative ideas that give them a competitive advantage in this knowledge-dynamic environment. In describing the two factors determining competitiveness, Szabo (2018) expressed internal factors as comprising the capabilities developed through the company's operations, while external market success factors determine external factors. Organizations must build resilience by anticipating potential internal and external threats, coping in adverse situations, and smoothly adapting to changing conditions (Evenseth et al., 2022). Manufacturing management must develop new strategies to meet up the demands of the customers in this dynamic and changing technological environment (Yang & Yang, 2019). In this case, the managers are challenged with changing the mentalities of the entire organization to pursue more efficient work practices that may lead to a better state of the organization (Bak et al., 2022; Bass, 1990). Organizational learning is vital in acquiring,

disseminating, and applying the knowledge needed to survive in the changing external and internal environment (Park & Kim, 2018). Kim and Park (2019) posited that through organizational learning, organizations could navigate and intervene to gain and sustain competitive advantage leading to expected outcomes through cognitive and behavioral changes.

A company's competitive advantage improves when it grows from creating values within its capability and capacity to creating values that exceed its capability and capacity (Oladimeji et al., 2020). A company's competitive power sustains its performance and positions it in the marketplace. Customers are willing to buy products and services of the best value at competitive prices. In research conducted in New Zealand across manufacturing firms, Agarwal et al. (2020) reported that most competitive manufacturing firms recorded improved organizational performances because of their abilities to produce at a low cost, minimal slack, increased production efficiency, and more efficient material handling. In other words, competitiveness can improve economic, corporate, managerial, and firm performance.

Companies must identify the most efficient and effective manufacturing methods to gain competitive advantages in this dynamic, knowledge-based, volatile, and global market. Singh and Singh (2020) reported that many companies are adopting new innovative manufacturing methods, high-quality products at low costs, and more efficient and low-maintenance manufacturing equipment to boost their competitiveness. Manufacturing companies must develop or adopt new manufacturing strategies, improve

the quality of their products, and learn to produce at a lower cost at faster rates than their competitors in the market. Kim and Park (2019) and Park and Kim (2018) emphasized that transformational leader uses motivation and trust to get the entire workforce to transcend their interests to pursue the organization's goals. In this case, the manufacturing manager's job is to motivate and encourage the entire workforce to move from just meeting the common goals of their company to bolstering their internal and external competitiveness to position their company well in the market.

Jnaneswar and Ranjit (2020) emphasized the critical role of leadership in bolstering the organization's competitive advantage. Transformational leaders have been marked by their tremendous success in building strong competitive advantage and organizational performance by inspiring the team to improve their job performance to surpass the organizational goal (Jnaneswar & Ranjit, 2020; Kim & Park, 2018; Park & Kim, 2019). Practitioners and researchers believe that learning capabilities give an organization an advantage over its rivals (Amarakoon et al., 2018). Learning is the foundation for innovation. Amarakoon et al. (2018) recognized that both technical (product and process) and non-technical (marketing and managerial) innovations are very critical to organizational growth and competitive advantage. Birasnav and Bienstock (2019) stated that manufacturing companies must enhance their internal processes to survive in this global economy. Building an outstanding supply chain collaborative network with suppliers and customers is critical to gaining a competitive advantage (Birasnav & Bienstock, 2019). Manufacturing organizations must improve their internal

and external processes, including technological innovation, product development, process management, production management, maintenance, customer relationship, marketing, human resource management, total quality management, supply chain, and the like, to strengthen the organization's competitive advantages (Amarakoon et al., 2018; Birasnav & Bienstock, 2019). Organizations that invest in organizational learning, primarily to bolster their competitive advantage and strengthen their workforce, always surpass others in the industry (Amarakoon et al., 2018).

Agarwal et al. (2020) expressed that competitive rivalry increases the organizational competitive advantage in the industry by leading the organization to better management practices. The success of an organization's management can be measured by its degree of competitiveness in the industry (Argawal et al., 2020). Good management practices will lead to a substantial competitive advantage. Management practices that bolster organizational competitiveness may lead to outstanding management performance. Manufacturing, responsible for 50% of U.S. export, is one of the most critical and competitive industries in the United States. (Polemis et al., 2020). Organizational managers and leaders should focus on reinforcing their workforce through organizational learning to improve their competitive advantages and performance.

Management plays a vital role in every business. Globalization and changing markets have posed unignorable challenges to businesses around the world. Firms in the United States must meet the competition in the global market. Profitability is the traditional purpose of every business. However, today's companies must adopt

sustainable practices that fulfill their stakeholders' sustainable expectations to stay in business, especially if they desire to get involved in the global market. In other words, companies are pursuing business practices that will generate high-profit margins and, in addition, sustainable practices that will satisfy the sustainability expectations of their consumers (Argawal et al., 2020). This means that the managers of businesses are faced with the challenge of incorporating their corporate responsibility practices into every level of their management systems. Undoubtedly, U.S. manufacturing managers must develop strategies that include environmental, economic, and social sustainability dimensions for business branding purposes, profit-generating, and more substantial competitive advantages. (Argawal et al., 2020). This means that the managers are expected to make the best strategic decisions to balance being socially responsible and profitable because many socially responsible activities are costly and do not have immediate financial rewards.

U.S. manufacturing managers are faced with the need to produce profitable products and to do so while maintaining a competitive advantage over their competitors. Incorporating the most current technology in today's manufacturing is critical to gaining outstanding competitive advantages (Yang & Yang, 2019). I4.0 has been adopted by many leading companies, namely, IKEA and Apple (Cohen et al., 2019). I4.0 is a new generation of smart factories based on the digitization of manufacturing and assembly processes (Cohen et al., 2019; Kuhnle et al., 2022; Li et al., 2018). Cohen et al. (2019) and Li et al. (2018) expressed that the smart factories of the I4.0 era are marked by

increased production flexibility that allows for easy reconfiguration of machines to achieve profitable manufacture of products in batches as small as the unique item. Every unit of the manufacturing firm needs to be developed to reflect the firm's market competitiveness.

Manufacturing firms must build effective and efficient robust production systems that respond to the market according to the different dimensions of competition. Manufacturing firms in many countries are pushing toward achieving efficiency in high-end manufacturing (Li et al., 2018). For instance, on May 8, 2015, China issued a 10-year national plan that centered on improving China's manufacturing strategies (Li et al., 2018). This plan will make the Chinese manufacturing industry stand out in the global competition. China's improvement strategies for its manufacturing industry include innovation-driven, quality-first, green development, structural optimization, and talent-oriented principles (Li et al., 2018). To achieve the goal of high-end manufacturing, China started transforming its low-end manufacturing into high-end manufacturing by investing in high-end equipment innovation (Li et al., 2018). Developed countries such as the United States, Germany, and Japan have prioritized their national economic plan to favor manufacturing and have developed reindustrialization strategies. For the above reasons, U.S. manufacturing managers must develop technological innovation strategies to bolster their competitiveness in the global market.

Cohen et al. (2019) emphasized that the radical changes in the manufacturing environment result from integrating numerous technological breakthrough innovations.

Countries and companies are challenged to respond to this dynamic and digital environment and to do so very fast (Zauskova et al., 2022). These technologies include big-data analytics (deep learning and data mining), enhanced computer vision, friendly robotics, communications, and Internet of Things, smart self-aware sensors and systems, and the cloud's virtually limitless memory and computing power (Cohen et al., 2019). This change in the manufacturing strategies allows customer involvement from the product design phase (Cohen et al., 2019; Zauskova et al., 2022). Many manufacturing entities have adopted cheap sensors and actuators that communicate through the Internet, leading to real-time connections between systems, machines, tools, workers, customers, and Internet of Things products (Cohen et al., 2022). Yelles-Chaouche et al. (2021) stated that many successful companies are moving flexible manufacturing systems (FMS) to reconfigurable manufacturing systems (RMS) because, unlike FMS, RMS is equipped with reconfigurable machines which can easily be added, removed, or reconfigured to achieve the desired production goal. The RMS can be used to handle a predefined family of products because they can easily be reconfigured by a mare changing their hardware or reprogramming their software (Yelles-Chaouche et al., 2021).

Manufacturing Strategies

Manufacturing is a core industry that significantly contributes to the world economy (Argawal et al., 2020). As one of the major sectors that make up the U.S. economy, in the second quarter of 2022, the nominal value added of manufacturing (durable and non-durable goods) was 11% of the GDP (BEA, 2022). Managers must plan

their manufacturing activities strategically to remain competitive and achieve better performance for their organizations. Strategic planning is one of the primary keys to the successful management of today's manufacturing firms in the current environment characterized by extreme competition, product customization, increasing technological development, and challenging environmental regulations (Alcaide-Muñoz et al., 2018).

Alcaide-Muñoz et al. (2018) defined strategic planning as a tool for controlling, coordinating, guiding, and integrating various organizational procedures and activities. Olhager and Feldmann (2018) posited that manufacturing strategies are sets of strategic and coherent decisions or structures a manufacturing organization must make to successfully carry out its manufacturing business and fulfill the company's objective (Olhager & Feldmann, 2018). Researchers deem manufacturing strategy a complex aspect of the business because it involves the strategic management of multiple phenomena, including the satisfaction of the customers' requirements, the management of manufacturing materials, increasing the competitive power of the organization, balancing the uneven resources such as machinery and man, and the bolstering of the organizational internal and external performance (Dohale et al., 2022). Hoang et al. (2020) and Kulkarni et al. (2019) concluded that manufacturing strategy is the ability of a firm to develop capabilities that give it a competitive advantage over others in the industry or market. These capabilities must be translated into different forms in every section of the manufacturing firm so that production can meet specific demands (Maldaner & Kreling, 2019). Researchers showed that manufacturing strategies positively affect the firm's

competitive advantage. Veloso Saes et al. (2022) emphasized that manufacturing strategies must be acceptable and practiced among all sections of the manufacturing firm to achieve a given organizational goal.

Skinner, in 1969, defined manufacturing strategy as harnessing the attributes of the manufacturing function to enhance competitiveness, then described manufacturing, in 1985, as a competitive weapon that aligns with the company's corporate strategy to improve its market competitiveness (Dohale et al., 2022). Dohale et al. (2022) and Olhager and Feldmann (2018) posited that management uses well-organized structures or manufacturing levers supported by the manufacturing policy to alleviate the effect of complexities associated with manufacturing. These structures or decisions are divided into two structural categories, namely structural and infrastructural (Dohale et al., 2022; Olhager & Feldmann, 2018). Structural decisions are capital-intensive physical attributes that are not easily reversible, while infrastructural decisions are short-time perceptions that describe the systems, policies, and practices that shape the management of the structural categories (Dohale et al., 2022; Olhager & Feldmann, 2018). Structural categories include process technology types, capacity, facilities, sourcing, and vertical integration, while infrastructural categories include production planning and control, quality systems, human resources, organizational structure, and workforce. Strategically, structural, and infrastructural decisions must be sound and balanced for the company to thrive in this market economy. Successful companies have made outstanding strategic

decisions that boost their structural and infrastructural categories (Dohale et al., 2022; Olhager & Feldmann, 2018).

In a concise sense, manufacturing strategies are coherent decisions that fall within the two structures that affect the organization's overall performance. According to Olhager and Feldmann (2018), researchers have proven that companies that link manufacturing strategies to other strategies, such as business, marketing, and sales, tend to achieve an outstanding performance over others that do not have manufacturing strategies linked to other strategies. Having structured manufacturing is essential and an effective means of transforming an organization by achieving its business goal of bolstering its resilience and competitiveness (Dohale et al., 2022). Olhager and Feldmann identified the criticality of developing and linking manufacturing strategies to functional strategies to achieve exceptional performance for the firm.

The capability of the manufacturing managers to achieve competing priorities through their manufacturing system is defined by the manufacturing strategy's configuration choices (Shukla & Adil, 2022). Companies must consider process choices at their manufacturing strategy formation level. Due to increasing customer demand, competition, and technological changes, manufacturing companies constantly adopt new manufacturing systems and strategies that are more flexible, robust, and state-of-the-art to survive in the current dynamic environment (Hashemi-Petroodi et al., 2021). There are many approaches to reconfiguring manufacturing systems to gain better performance

which is why company leaders face difficulty choosing the best approaches (Ncholds et al., 2018).

Company leaders can choose from multiple kinds of manufacturing systems approaches, including applying lean manufacturing to optimize assembly lines, maximizing the uptime of equipment to improve manufacturing systems, and adopting green manufacturing to fulfill the company's environmental, social, and economic needs. These approaches target specified systems design goals. Several challenges affect manufacturing management system reconfiguration, including choosing the most beneficial performance measures, limited resources, time, and reconfiguration cost (Hashemi-Petroodi et al., 2021; Nicholds et al., 2018). Managers must make timely and best decisions by employing performance measures to select the best approaches to maximize performance and maintain a competitive advantage while achieving significant productivity improvement (Nicholds et al., 2018). Manufacturing strategy has been a popular research topic in the past few decades; many firms fail in this industry due to a lack of solid competitiveness owing to their inefficient manufacturing strategies (Kulkarni et al., 2019).

Companies consider vital factors such as cost, profit, environmental issues, competition, and the like, before deciding what manufacturing processes to adopt. For instance, even though manufacturing processes contribute immensely to the world economy, it is one of the high contributors to environmental pollution (Shukla & Adil, 2022). Manufacturing managers must strategically plan and choose their processes and

approaches to satisfy their performance goals without jeopardizing the environmental and social sustainability goals. Flexibility and efficiency are two of the most critical manufacturing strategies richly explored by researchers (Lu & Huang, 2019). Manufacturing managers are challenged to make the right decisions at the correct times to foster better organizational performance. Manufacturing decisions can affect the internal and external competitiveness of the organization (Nicholds et al., 2018). The potency of manufacturing strategies adopted by firms is tested by the extent external factors, such as environmental hazards and global economic crises, affect the firm (Nair et al., 2021).

Leaders must develop and sustain the characteristics and skills needed to cope in this environment challenged by increasing customer demand, competition, and technological and environmental changes (Hashemi-Petroodi et al., 2021). Organizations must cascade to a better position by developing and adopting efficient strategies to cope with the current business challenges. Manufacturing managers' strategies to implement efficient manufacturing systems are crucial to developing outstanding organizational performance. Before embarking on them, managers must understand the benefits and demerits of each manufacturing system, process, and approach. The manager’s job is to lead the company to success, which must be done in a timely and cost-effective fashion without negatively impacting the social and environmental aspects (Nicholds et al., 2018).

Organizational Transformation and Change Management

Many researchers and practitioners have found that the leader's role is critical in organizational transformation and transformational processes, especially in the current mixed, challenging, global, and dynamic market (Demirtas et al., 2020; Fredberg & Pregmark, 2022). A transformational leader aims to focus the leader's transformational abilities or characteristics on influencing the employees to place the organization's interests and development over their interests by inspiring them to develop and devote their skills, energy, and creativity toward achieving the collective goals of the organization with minimal supervision (Demirtas et al., 2020). In other words, the leader is the agent of change who also converts the employees into change agents. When the leader successfully raises the employees' intellectual level, success orientation, meaningfulness, self-efficacy, and individual welfare, the employee focuses on being a part of the organizational transformation agency to achieve the organizational mission and exceed it (Bass, 1990; Demirtas et al., 2020; Dionne et al., 2004; Fredberg & Pregmark, 2022).

Transformation is stimulated by improving or moving away from the status quo (Fredberg & Pregmark, 2022). Conventionally, organizations tend to move from their current operational position to another that is presumed to be better. Threats such as environmental factors and extreme competition may create an organizational sense of urgency which, in turn, instills the need to move the organization from its current to a different state (Fredberg & Pregmark, 2022; Ratana et al., 2020). Gallego and Hernández

(2021) expressed that researchers agree that organizational transformation and change are equivalent in concept, even though organizational transformation requires a rapid but in-depth and generalized change. Rapid change may incite the organization to adopt a prevention focus (Fredberg & Pregmark, 2022). In a prevention focus approach, organizational leaders tend to discourage plans to change the current standard and encourage avoiding risks and errors. However, researchers have argued that transformation should involve renewal capabilities, including creativity, learning, explorative works, and commitment (Fredberg & Pregmark, 2022; Smit, 2021; Stanescu et al., 2020).

Fredberg and Pregmark (2022) emphasized the importance of change management in an organization. Even though change management is as old as human history, the topic is still very much in every business discussion today. Change management has become a critical aspect of organizational management because change keeps changing (Ratana et al., 2020). Smit (2021) emphasized that organizational change occurs when the organizational leaders or managers are interested in the continuity of such an organization or meeting its internal and external expectations. In other words, organizational change is the process and effects of altering one or more components of the organization, such as its strategies, systems, structure, infrastructure, behaviors, culture, and the like, to meet its internal and external expectations (Fredberg & Pregmark, 2022; Ratana et al., 2020: Smit, 2021). A focus on organizational growth, creative solutions, expansion, innovative ideas, stimulation of organizational citizenship, and the

like, is called a promotion focus (Fredberg & Pregmark, 2022). In prevention focus, leaders and organizational members stick to incremental improvements and error reduction as a reaction to urgency (Fredberg & Pregmark, 2022). Bak et al. (2022) argued that organizational leaders influence employees' reactions or behaviors, impacting organizational performance. Through the lens of leadership influence, Fredberg and Pregmark (2020) specified that organizational leaders, through their management systems, can induce either prevention or promotion focus on their employees. Smit reported that organizational transformation poses the need for organizational cultural change.

Organizations develop, share, and internalize core values and beliefs over time (Khan et al., 2021; Smit, 2021). These core values and beliefs form the mindset of the organizational members, thereby influencing their behaviors, actions, and decision-making (Khan et al., 2021). This mindset makes it difficult for the members to understand why they act and behave the way they do. Organizational culture does not rapidly change (Smit, 2021). Instead, it consistently but slowly changes over time. Cultural change is a section of organizational transformation. Transformation and cultural change involve all aspects of the organization, including the entire stakeholder, processes, products, and business (Hubel, 2022; Smit, 2021). Smit (2021) stressed that cultural change is not a quick process: organizational culture lags behind the organizational transformation.

Many theoretical frameworks have been developed to offer the best approach to change management. According to Ratana et al. (2020), there are many stages and phases in developing change management theories, and it is difficult to identify their origins. Consequently, the origins are grouped into three main zones: (a) the planned change approach (before the 1990s); (b) the era of emergent change management theories (during the 1990s); and (c) the contemporary change management theories (newer ones). Ratana et al. emphasized that diversity and urgent technological development demands have complicated change management.

Over 100 years ago, Frederick W. Taylor (1911) introduced his change theory which started in the fields of engineering management and industrial engineering (Ratana et al., 2018). Taylor's theory centered on the treatment of employees by organizations; however, "change management" was established only in the late 1960s. Before this, the discourse was on organizational development. Even though most scholars mistakenly attribute the coining of the term "change management" to Kurt Lewin, Kurt Lewin only proposed a planned change approach, stating that top managers must have a clear change projection to achieve effective change (Ratana et al., 2018). In other words, change must start with a clear objective consolidated by planned actions and projectable results.

Organizations must learn to consider fundamental factors such as the firm's history, values, and traditions to encourage the anticipation of change and overcome resistance to change (Neves et al., 2018). Neves et al. (2018) emphasized that change is inevitable and crucial, especially in this everchanging and dynamic economy, and yet

one-third of the firm's change implementations fail. These change implementations fail because of the organizational team's resistance to change, inadequate organizational infrastructure, lack of continuity, and business environment. Resistance to change includes what happened before and during change processes that prevented the success of the desired change. When firms treat change as a new process instead of a continuation, change implementation tends to fail (Neves et al., 2018). In other words, organizations should treat change as an ongoing activity and a part of the organization's life cycle.

Diversity Management

As businesses respond to globalization and market competition, their workforce and stakeholders diversify (Chen et al., 2019; Fitzsimmons et al., 2019). This diversity in race, gender, age, education, nationality, language, and the like, can pose a severe challenge to the organization's management. There is a need for managers to develop more efficient means of managing their multicultural workforce. Fitzsimmons et al. (2019) stated that teams in a diverse workforce often face some adverse effects, including unconscious bias, stereotype threat, exclusion from critical social networks, lack of role models, and unaware managers. Management of multicultural groups has become a challenge because the managers must enforce the organization's corporate policies without undermining the different cultures in their organizations (Fitzsimmons et al., 2019). The managers must enforce the company rules and ascertain that the positive feelings of their different cultures, races, backgrounds, nationalities, and ethnicities in their company are strengthened (Zeguniene, 2021).

Practitioners and researchers agree that almost every business in the world deals with the effects of internationalism and globalism directly or indirectly (Chen et al., 2019). Globalization, business expansion, and other challenges have created the need for businesses, governments, researchers, and others to develop efficient but sustainable ways of dealing with multiculturalism (Chen et al., 2019; Fitzsimmons et al., 2019; Zeguniene, 2021). The international boundaries get thinner by the day as more technologies, such as virtual business, the internet of things, and others, are developed (Zeguniene, 2021). As market challenges increase due to product and market competition and employing immigrants to achieve the company's mission has become inevitable, managers must learn how to communicate and relate with employees of all backgrounds and cultures in their organizations (Chen et al., 2019; Zeguniene, 2021). Transformation of the workforce has become a core topic in businesses around the world, especially over the last decades, because of the increasingly diverse work group spurred by demographic changes, which, in turn, has sparked the shifting of organizations from work organized around individuals to team-based work structure (Karolidis & Vouzas, 2019). Company managers and the entire workforce must be aware of the different lifestyles, languages, attitudes, values, meanings, and needs as the company diversifies (Zeguniene, 2021).

Diversity management involves addressing workplace diversity, such as employee age, gender, ethnicity, education, nationality, and language, with fairness, justice, and equity (Li et al., 2021). Jankelova et al. (2022) expressed that workplace diversity management should also address differences in experiences, skills, abilities, beliefs, and

the like. Diversity management should promote absolute inclusiveness of all stakeholders and address job-related issues, including unsuitable and undesirable job responsibilities because person-job mismatch can negatively impact employee performance (Li et al., 2021). In other words, every employee has unique strengths and weaknesses, and it is necessary to find the proper use for the individual strengths and the best strategy to improve personal weaknesses. Successful management of these diversities in beliefs, language, skills, nationality, color, race, and education, among other things, enhances the workplace's value, competitive advantage, and organizational performance in this dynamic global economy with growing societal pressure for integration (Jankelova et al., 2022).

Recent researchers believe diversity climate is one of the ways diversity management is measured: more researchers are dedicating more research to diversity climate (Jankelova et al., 2022). Diversity climate is the degree to which the employees believe that their workplace values and integrates diversity and incorporates diversity in the workplace practices through equity, justice, and fairness. This means that the employees' belief or disbelief in the diversity management ideologies is critical to such a firm's performance. Diversity management must be noticeable and impactful to the employees to gain their approval, engagement, and loyalty to the organization. Therefore, Jankelova et al. (2022) stated that outstanding diversity management had been found to reduce employee intention to quit significantly.

Many company leaders pursue good diversity management because it is morally and ethically responsible; many researchers treat diversity management as corporate social responsibility (Jankelova et al., 2022; Li et al., 2021). Good diversity management aims to provide a professional, conducive, accommodative, and equal work environment for employees of all backgrounds. Some researchers view good diversity management and multiculturalism as a source of innovativeness and scarce resources and skills (Zeguniene, 2021). Li et al. (2021) reported that many companies pay close attention to diversity management because of financial losses associated with discrimination lawsuits. Researchers have proven the positive correlation of diversity management with organizational performance (Jankelova et al., 2022). Good diversity management promotes job satisfaction, employee citizenship, and engagement. Job satisfaction encourages commitment, loyalty, and employee performance (Shafi et al., 2020).

Intercultural communication is one of the critical tools in managing increasing interculturalism spurred by globalization, internationalism, and market dynamism (Zeguniene, 2021). The effect of interculturalism is inevitable for several reasons, including the expansion of the labor market, migration of people from one part of the world to another, the necessity of organizations including workers from different cultures and backgrounds in their workforce, international collaborations, virtual business, and the like (Catalano & Barriga, 2021; Zeguniene, 2021). Many companies today conduct business in other parts of the world without physically being together. Rodriguez et al. (2018) expressed that international collaboration can increase innovativeness, skills, and

knowledge and identified the innovative effect of the two dimensions of international collaboration: proximity of partners and diversity among these partners. Concisely, most organizations today aim to build a competitive global business that meets the requirements of both foreign and local stakeholders.

Ever-increasing globalization and the evolvement of virtual business and communication have made many organizations flexible: flexibility is a new competitive advantage in this global and dynamic market (Zeguniene, 2021). Consequently, intercultural communication is the key to successfully managing intercultural cooperation because it encourages globalization, strengthens positive feelings of immigrants and foreigners, and promotes culture (Zeguniene, 2021). Though one cannot be an expert in every cultural, ethnic, or market nuance, intercultural communication helps organizational leaders avoid misunderstandings due to language and cultural barriers (Zeguniene, 2021). Businesses must develop intercultural communication skills to manage stereotypes, negotiate meanings, understand nonverbal communication, and inspire team spirit (Catalano & Barriga, 2021). Intercultural communication skills are strengths or abilities for effective communication and harnessing values in a diverse group (Catalano & Barriga, 2021). Interculturality has been expressed as pursuing a harmonious and mutual relationship, developing effective communication, and encouraging equity, fairness, and justice in a culturally diverse environment (Catalano & Barriga, 2021; Zeguniene, 2021).

Innovative Work Behavior

Byukusenge et al. (2021) defined innovation as introducing changes that impact processes, products, and markets. Innovation involves developing new capabilities that can give an organization a better competitive advantage, especially in this current business environment characterized by increasing global competition and changing technology (Byukusenge et al., 2021; Ting et al., 2021). In a concise sense, innovation is the discovery of new capabilities that may enhance processes, products, and markets (Bak et al., 2022; Byukusenge et al., 2021). Innovation is crucial not only in profit businesses but also in nonprofit businesses. Organizations need to be innovative to meet all the transformations around their businesses (Messmann et al., 2022).

Systems thinking has become very important, especially in responding to the increasing demand for organizations to respond to the growing market competition and globalization (Stanescu et al., 2020). Organizational leaders are faced with the challenge of leading their organizations to be innovative. Systems thinking helps organizations push to become innovative to grow or survive competition and globalization (Stanescu et al., 2020). Stanescu et al. (2020) expressed that organizational innovation is critical for responding to today's market defined by knowledge-intensive dynamics. Prior studies showed that three factors affect organizational innovativeness: the organization's characteristics, the individual behaviors of the organizational members, and other extra-organizational factors (Mokhber et al., 2015). Among the three factors, the individual

behavior of the organizational members is the most researched: this led many researchers to study the influence of organizational leadership on organizational innovation.

Consequently, organizations must have individuals (managers and subordinates) who are innovative or at least seek innovative solutions to meet up with the challenging environment characterized by changing technology, global competition, and market volatility (Bak et al., 2022; Byukusenge et al., 2021; Messmann et al., 2022). IWB is the individual development and contribution to the development of innovations. Many researchers and practitioners have found that IWB is associated with many benefits, including improved work processes and outcomes and stimulation of employees' professional development (Messmann et al., 2022).

According to Bak et al. (2022), innovation is divided into individual and organizational innovation levels. Leadership is critical in organizational innovation (Mokhber et al., 2015). Researchers have found that effective leadership directly influences individual and organizational innovation (Mokhber et al., 2015). Thuan (2020) concluded that employee creativity is the base rock of employee and organizational innovation, effectiveness, and survival. Employee creativity enables employees to generate products, services, and processes that are very effective, valuable, noble, and efficient (Thuan, 2020). Shafi et al. (2020) stated that leadership is one of the factors that develop or hinder employee creativity and organizational innovation. Consequently, Mokhber et al. (2015) showed that having the right leader with the right behaviors to build an innovative organization is essential to achieving impressive performance. Many

organizational leaders have discovered that developing employees' innovative work behavior directly improves organizational innovativeness (Pradhan et al., 2019; Stanescu et al., 2020). Many organizational leaders and managers invest significant resources to identify and develop their employees' IWB. Many leaders have understood that IWB encourages employee involvement, especially under challenging work scenarios (Bak et al., 2022). IWB helps improve efficiency and allows employees to develop more vital problem-solving abilities (Bak et al., 2022; Pradhan et al., 2019). When employees gain innovative solution abilities, they help create the process of innovation in their organization. IWB helps employees manage the uncertainties of transformations and changing business environments. Employees become empowered and proactive in solving the organization's problems when they are encouraged to possess IWB (Messmann et al., 2022).

Researchers and practitioners have found that certain leadership styles help increase employees' IWB (Pradhan et al., 2019; Stanescu et al., 2020). Transformational leaders exceed their organizational goals by motivating and influencing their employees to be more innovative. Such leaders empower their employees to develop skills that make them more efficient, independent, and knowledgeable (Pradhan et al., 2019). Transformational leaders use motivation to elevate their employees from regular workers to valuable and significant organization members (Bak et al., 2022; Demirtas et al., 2020; Pradhan et al., 2019). This increases employee engagement, consequently improving companies' performance (Bak et al., 2022). Such leaders achieve employees' IWB by

empowering employees to exercise discretion to change work processes and by providing employees with valuable organizational information, including goals, performances, new products, financial information, and the like (Bak et al., 2022; Pradhan et al., 2019; Stanescu et al., 2020). Employees' IWB, in this knowledge economy, is critical because it involves the role of the employees in creating and generating new ideas, which, in turn, lead to the growth, success, and sustainable development of the organization (Bak et al., 2022; Pradhan et al., 2019).

Burns (1978) defined transformational leadership as the leader harnessing the followers' abilities and using these abilities to exceed the goals of the leader and followers (Bak et al., 2022). A transformational leader does this by influencing and transforming the characters and attitudes of the followers. In this way, the followers become more valuable and skillful, becoming increasingly innovative and more independent (Bak et al., 2022; Pradhan et al., 2019; Stanescu et al., 2020). Shafi et al. (2020) stated that businesses are in an era that requires massive organizational resources for technological development to meet the market's competition. Organizations must survive by improving their performances and creatively and innovatively engineering, producing, and marketing their products and services (Shafi et al., 2020).

Transformational leaders aim to motivate their employees to exceed performance expectations by aligning their self-perceptions to their organization's mission (Bak et al., 2022). A transformational leader influences subordinates to perform beyond expectations by helping them attach meaning to their work (Bak et al., 2022). This sense of relevance

motivates the employees to engage in extra activities toward the organization's mission (Bak et al., 2022; Pradhan et al., 2019; Stanescu et al., 2020). When their jobs become relevant and purposeful, employees engage in IWB. IWB includes employee behaviors that improve organizational and individual work outcomes and develop, promote, and sustain new ideas (Bak et al., 2022; Byukusenge et al., 2021).

In this current knowledge-based dynamic environment, leaders must be innovative. Leaders who are bent on using traditional approaches struggle in this environment. More unconventional leaders willing to tolerate certain risks with their employees tend to be more successful (Bak et al., 2022). Many successful leaders in this environment are often innovative and tend to inculcate innovation in their subordinates (Bak et al., 2022; Byukusenge et al., 2021). Transformational leaders accept the mistakes of their employees and are willing to motivate them to engage in IWBs patiently.

Sustainability

Researchers showed that firms' stakeholders respond positively to practices that favor environmental protection, economic growth, and social justice (Bals & Tate, 2018). Manufacturing firms must adopt these sustainable practices to satisfy the expectations of their stakeholders, stay competitive, and attract new businesses from companies and societies that favor sustainable practices. The severity of the integration of sustainability in today's business practices is evidenced in the United Nations' (UN) adoption of the sustainable development goals in September 2015 (Horak et al., 2018). Sustainable development goals are goals set by the United Nations that businesses, cities, and

societies need to adopt to protect humanity and the planet. According to the United Nations, sustainability means meeting today's environmental, economic, and social needs without hampering the opportunities for future generations to meet their environmental, economic, and social needs (Horak et al., 2018). Companies must consider the futuristic environmental, economic, and social implications of their today's business activities.

Traditionally, businesses are set up for profit-making purposes. Haessler (2020) and Kota et al. (2021) agreed that the benefits of sustainability accrue over a long period. Many managers choose financial gain over sustainability when the economic benefits of sustainability are unclear in the short term because short-term thinking is influential in many business decisions (Bonsu, 2020; Haessler, 2020). Bals and Tate (2018) emphasized the importance of satisfying the triple bottom, namely, environmental, economic, and social dimensions. The purpose of a firm should be redefined to create shared value and to bring new approaches to generate a higher degree of innovation to meet this new requirement; meeting the triple bottom (Hübel, 2022; Kim et al., 2019). Incorporating sustainability into business strategies is vital, especially because many international and local regulations are geared toward mounting pressures on companies around the world to be responsible (Bonsu, 2020; García et al., 2020; Hübel, 2022). To this effect, García et al. (2020) stated that the United Nations presented Principles for Responsible Investment in 2016. The three core principles that investors should consider when investing are ethical, social, and environmental issues. UN intended to use the

Principle for Responsible Investment to encourage investors to act as activists stirring companies to be socially responsible.

Horak et al. (2018) reported that many companies are sustainable because of regulatory pressures from the government and the stakeholders. For example, during the COVID-19 pandemic in 2020, many companies adhered to government sustainability regulations to qualify for government-funded COVID-19 reliefs and subsidies (Horak et al., 2018; Kota et al., 2021). Only a few businesses adopt sustainability-based activities as an integral part of their corporate missions, especially when sustainability and financial performance are at odds with each other (Horak et al., 2018). Apart from financial ability and laws and regulations, the top management team, and the application of stakeholder theory influence sustainability decisions (Bonsu, 2020).

Companies must choose between short-term economic gain or sustainability, especially since internal and external stakeholders' sustainability expectations are high (Haessler, 2020; Horak et al., 2018; Qing & Jin, 2022). Haessler (2020) reported that many companies are increasingly integrating the triple-bottom line, corporate social responsibility, and other sustainability practices into their business systems and policies to achieve better organizational performance. Researchers and practitioners have proven that stakeholder expectations motivate firms to adopt sustainable practices to satisfy regulatory demands and financial performance (Armando et al., 2021; Kim et al., 2018). Kim et al. (2018) stated that by revenue, the world's 250 largest companies publish their

corporate responsibility report regularly to satisfy consumers' and other stakeholders' sustainable economic development expectations.

Presently, sustainability and other corporate social responsibilities (CSR) have become sources of competitive advantages (Bals & Tate, 2018), even though it is not easy to fulfill the three dimensions of sustainability, namely social, environmental, and financial (Horak et al., 2018). CSR is generally an expectation that a company will be responsible enough to strike a balance between pursuing economic gain and the well-being of society (Berezianko et al., 2022). In other words, good management practices protect the interest of society and preserve the environment while achieving the economic mission of the firm. Considering the multidimensionality concept of responsible management strategies, Berezianko et al. (2022) found that ideal companies adhere to existing social norms, voluntarily comply with optional sectoral or national standards, and initiate voluntary ethical actions.

The issue of sustainability must be integrated into every aspect of the business. For example, sustainable human resource practices have been defined as the integration of human resource management practices and strategies to satisfy the organization's economic, ecological, and social goals over a long period (Dar et al.,2021). Mahmood et al. (2019) expressed that the activities of an organization may seriously affect the organization's sustainability implementation. CSR at a firm level can affect the employee's outcome: the employee's perception of the firm-level CSR can affect the organization's performance (Mahmood et al., 2021). Organizations must pursue socially

responsible practices to appeal to their stakeholders and communities and remain competitive.

To improve upstream and downstream performances and to achieve the triple-bottom goal, May and Stahl (2017) emphasized the need for manufacturing companies to turn sustainable operations into a competitive advantage. The drivers of sustainability integration can be grouped into internal and external: the internal drivers are the top management engagements, while the external drivers are compliance with the laws and regulations (Berezianko et al., 2022; Horak et al., 2018; Qing & Jin, 2022). Mahmood et al. (2019) reported that many companies fail to implement sustainability because of a lack of training and skills. Organizations must train and inspire their employees to pursue those activities that promote sustainability.

Researchers identified sustainability as a source of innovation, and to that effect, many manufacturing firms have made sustainability a crucial topic (Kim et al., 2018; Qing & Jin, 2022). According to Naeemah and Wong (2022), sustainable performance has been identified as a significant innovation in socially and environmentally responsible organizations. Such organizations also pursue sustainable manufacturing by using techniques and strategies that promote the conservation of energy and natural resources and have minimal or no negative environmental impact. Leading companies such as Hewlett-Packard, IKEA, Ford, Apple, and the like, incorporate environmental sustainability in their chain to improve their performance (Kim et al., 2018). Naeemah and Wong established that most sustainable companies achieved sustainability by

implementing sustainable performance at every level and function of the organization. Even though in prior studies, researchers showed the negative effect of environmental sustainability on a firm's performance, new research has proven the opposite, and innovation has been defined as the mother of sustainability (Kim et al., 2018).

There is a need for managers of firms to train their entire workforce in sustainable principles to achieve the three triple-bottom line dimensions, namely, economic, environmental, and social (Horak et al., 2018). Image branding, stakeholder trust, efficient resource management, and improved performance are some benefits of sustainability (Horak et al., 2018; Kim et al., 2018). A manufacturing company's human resource management is vital for successful sustainable management and outstanding environmental performance because human resource management is directly involved in implementing strategies, achieving sustainability, and developing sustainable operations (Dar et al., 2021). Most sustainable organizations incorporate sustainability in their missions, strategies, and operations developments (Dar et al., 2021; Horak et al., 2018).

Manufacturing has been redesigned owing to the increased demand for green manufacturing and sustainability. Manufacturing managers are faced with the challenge of satisfying their stakeholders' expectations without jeopardizing their companies' financial performance (Chen et al., 2019). There is a need for manufacturing leaders to adopt sustainable manufacturing strategies that fulfill both the economic and sustainability goals of their firms. The manufacturing business and roles of manufacturing managers in the last few decades have been redefined owing to the green

economy and sustainability-related activities, especially since global manufacturing activities are responsible for 20% of global carbon dioxide emissions based on reports in 2011 (Afum, Agyabeng-Mensah, Sun, et al., 2020). Companies that are socially responsible and adopt green manufacturing practices (GMP) understand the sacrifice and balance between economic and social responsibilities. Companies achieve green manufacturing when they use appropriate and highly efficient materials that do not negatively impact the environment in their production processes. Successful greenhouse manufacturing and GMP implementation have been proven to raise the company's reputation and competitiveness (Afum, Agyabeng-Mensah, Sun, et al., 2020).

Shahzad et al. (2022) stated that the philosophy behind GPM is that since manufacturing activities contribute immensely toward environmental unsustainability and pollution, manufacturing organizations should contribute toward the pursuance of environmental sustainability. Researchers showed that GMP is linked to better economic performance in Turkey and other parts of the world where they are implemented (Shahzad et al., 2022). Firms embrace GMP to ensure that they meet product quality standards and that operational activities are benign or harmless to workers and environments using appropriate resources and eco-oriented technology (Afum, Agyabeng-Mensah, Sun, et al., 2020; Shahzad et al., 2022).

OM

According to Manikas et al. (2020), OM is one of the management's fundamental functional areas for creating quality goods and services for the company. OM cuts across

other functional areas of the business, including the supply chain. Before the 1960s, time and motion studies, activity scheduling charts, and assembly lines were some of the OM areas of interest (Manikas et al., 2020). Assembly lines such as Ford's Model T were popular before WWII, and the Japanese companies' use of just-in-time, total quality management, and statistical quality control to improve manufacturing production became widespread post-WWII (Manikas et al., 2020). Between 1982 and 1987, available literature showed seven areas that made up OM, including inventory control, aggregating planning, forecasting, scheduling, capacity planning, purchasing, facility location, facility layout, process design/technology, maintenance, quality, work measurement, strategy, quality of working life, project management, services, and distribution (Manikas et al., 2020). Newer additions include business process engineering, six-sigma, enterprise resource planning systems, the internet, logistics, and supply chain management. LM tools, such as JIT, TQM, kaizen, and the like, are the most used OM tools in manufacturing and other management.

The company's management should be systematic, flexible, and open to changing environments and must be equipped to exceed the company's financial, managerial, and sustainability goals (Berezianko et al., 2022; Forth & Bryson, 2019). Roy et al. (2018) reported that management must use the most efficient manufacturing systems that enable the organization to produce the best quality goods at the least cost and time. Business strategy is defined as achieving goals and setting competitive advantages (Eker & Eker, 2019). The two types of business strategies are cost leadership and differentiation

strategies. Cost leadership strategies deal with market share, monitoring of economy of scale, strict cost control, patented technologies, and the like. Differentiation strategy is used in areas like continuous monitoring of the environment. Differentiation strategy is proactive and innovative to maintain the current position of the company's products and services, enabling customers to perceive offered products and services as unique and needed by keeping prices low and achieving satisfactory profitability without reducing cost (Eker & Eker, 2019).

Operational excellence is used to measure the company's operating performance (Golcher-Barguil et al., 2019). This requires that the directors and managers of the company establish performance metrics that enable efficient management of their processes and operations. Mainly, measures of operating performance focus on reducing input without much focus on increasing outputs. The OM of a manufacturing company is vital to the company's success and mission of building a more substantial competitive advantage. OM is responsible for optimizing every process at every level to bolster better competitive advantage and performance (Kuhnle et al., 2022; Szabo, 2018). Bahria et al. (2019) emphasized that integrating the three main functions of industrial management, production, maintenance, and quality, will result in significant operational cost savings and improved efficiency. Setting up and monitory optimum buffer stocks for the production system is one of the ways to improve performance (Bahria et al., 2019).

Szabo (2018) emphasized that the management must focus the company's resources on reducing costs and time to satisfy the customer and to increase the

company's performance. Golcher-Barguil et al. (2019) suggested that managers must analyze every aspect of operations to understand the areas that directly impact operational performance to deliver the most value to the customers. Furthermore, operations management is tasked with successfully developing and implementing practices and strategies that foster boisterous product manufacturing competitiveness. In other words, leadership greatly influences the company's success (Burawat, 2019). For example, in research involving 540 managers of automotive companies in Thailand, transformational leadership has a direct positive influence on the success of lean implementation (Burawat, 2019). Managing the workforce in the production operation is crucial because the shop floor employees take care of the product and process handling on the shop floor. (Magnanini et al., 2021). Magnanini et al. (2021) emphasized that the management of shop floor operations should include proffering the proper training for upskilling, matching jobs with the skills, managing processes through the operators, and the like

OEE is one of the manufacturing industry's most used operational excellence metrics (Dadashnejad & Valmohammadi, 2019; Kechaou et al., 2022; Tsarouhas, 2020). OEE is used to measure the effectiveness of production machinery and reduce, correct, and improve production continuously (Dadashnejad & Valmohammadi, 2019; Kechaou et al., 2022). Kechaou et al. (2022) posited that managers use OEE to measure performance losses and determine the most appropriate techniques for improvement projects (Kechaou et al., 2022). Company leaders are responsible for establishing a clear vision of the organization's current and future line of action in the current environment

characterized by dynamism and extreme competition (Singh et al., 2020). The management must define the path forward that will foster competitive advantage and outstanding performance. For instance, environmental management is becoming a defining factor for many businesses. Many companies have adopted green manufacturing due to regulatory pressures from regulatory institutions and customer requirements (Kalyar et al., 2019; Singh et al., 2020).

Environmental management has become one of the biggest challenges for managers because it is now a significant source of competition, even though its contributions to organizational performance and the bottom line are unclear (Afum, Agyabeng-Mensah, Ahenkorah et al., 2020; Inman & Green, 2018; Singh et al., 2020). To understand which systems and practices to invest in, operational managers must develop measures that reveal such practices' effectiveness, efficiency, and value (Eker & Eker, 2019). Even though many business leaders believe that investing in sustainability can negatively affect the company’s financial performance, many researchers have recently shown that incorporating lean and green manufacturing with other environmental practices can bolster corporate performance (Inman & Green, 2018). Eker and Eker (2019) emphasized the criticality of management control systems (MCS) in data collection and processing and determining the adequate actions, consequences, and remedies of the operations management activities. MCS must align with the strategy and must be compatible with environmental uncertainty, for instance. In other words, the MCS must agree with the business strategy, and the business strategy must align with the

environmental uncertainty. Environmental uncertainty makes it difficult for businesses to maintain one position making it an important factor in considering and formulating strategy. In these three environmental uncertainties, namely, customer, technology, and competition, companies receive incomplete or confusing information, making it challenging to maintain their business strategy or control their future (Eker & Eker, 2019)

Formal and informal results, boundary, planning, and cultural control are some of the various types of controls that shape the appearance of MCS. The four main components of MCS are vital during the process of control in four ways, namely, the dictator component, which generates information about what is happening; the reviewer component, which assists in comparing what is happening with standards; the executing component, which is presented as a device that can change the behavior of the system when necessary; and the communication components which is a communication network which transmits data among the previous three (Beuren & Dal Vesco, 2022).

Beuren and Dal Vesco (2022) suggested that operations managers must pay attention to the four dimensions of the theory of cooperation: (a) learning to share valuable information with the entire stakeholders; (b) improving problem-solving skills; (c) learning to adapt to changes since change is inevitable; (d) restraint from use of power. Furthermore, Zhou et al. (2022) established that the manufacturing sector is constantly improving because of its global and local challenges. Due to the aggressive development of automation technology, robotics, and new-generation information and communication technologies such as the Internet of Things, 5th-generation mobile

network, and big data, many prominent manufacturing countries and companies are rapidly moving from automation to manufacturing intelligence (IM) to address the manufacturing sector's challenges such as globalized market, talent-related issues, diversity, growing competitive pressures from unexpected sources, and the like (Zhou et al., 2022).

Consequently, many leading manufacturing countries in the world are developing systems to improve their manufacturing sectors, such as the German government's proposed system called Industry 4.0 strategy, which builds a cyber-physical system based on; the United States' development of the U.S. Advanced Manufacturing Partnership; China's mission to make all their products in China by 2025, Japan's development of Japan's White Paper on Manufacturing Industries, GE's investment of over 200 million dollars in a smart factory in Prune, India, Audi's establishment of a smart factory in Mexico, and many such initiatives that aim to move manufacturing from automation to IM (Zhou et al., 2022). IM utilizes features like connectivity, optimization, transparency, flexibility, predictiveness, and agility to adapt to changes in the internal and external environment, autonomous operations continuously to raise product quality, performance, and service level while reducing cost and resource consumption to support more rational management decisions (Zhou et al., 2022). Operations managers must be current with the changes in manufacturing to remain productive, competitive, and profitable (Manikas et al., 2020). Christ et al. (2022) stated that many leaders are not thorough in their planning. During manufacturing planning, the managers must link their planning to other functions

for their plans to work. The operations managers must adapt and use the most effective and efficient operations tools, methods, and practices to enhance the company's product quality, operational performance, and internal and external competitiveness.

LM as OM Tool

Manufacturing leaders achieve successful LM implementation by acting on the Muda sources: Muda is a Japanese word for waste (Chen et al., 2019). The concept of lean manufacturing is based on the identification and elimination of every activity that does not add value to the customer or the manufacture of the good: it involves the entire workforce in a continuous improvement towards the efficient delivery of quality products to customers (Bai et al., 2019; Naeemah & Wong, 2022). The seven kinds of muda associated with production in TPS are overproduction, delay, transportation, excess processing, unnecessary inventory, movements, and defects (Bai et al., 2019; Jimenez et al., 20219). Muda is any activity that increases costs without adding value to the finished product or the customer (Morales-Contreras et al., 2020). Kalyar et al. (2019) found that traditional ways of manufacturing are characterized by wastage of materials and resources, usage of environmentally unfriendly material, non-value-added practices, less-controlled processes, lack of preventative measures, and overhandling of materials, and the like during the production process. Operation managers adopt lean manufacturing, environmental management, and other such practices to eliminate wastes associated with traditional manufacturing through the involvement of the entire workforce. Unlike conventional manufacturing, LM makes it easy to identify potential manufacturing issues

since every organization member at every manufacturing stage is involved in LM implementation (Naeemah & Wong, 2022).

Arumugam (2022) reported that the primary aim of management practices should be to increase performance levels, and lean management is known to transform organizations to the best performance levels. Afum, Agyabeng-Mensah, Ahenkorah et al. (2020) insisted that LM improves product quality and environmental performance through waste elimination. Many manufacturing companies implement LM because it helps them do much with less. LM implementation strategies must be flexible because the production system must undergo continuous improvement based on what the system requires at a particular time (Lim et al., 2022; Morales-Contreras et al., 2020). When implemented effectively, it helps the organization meet its competitive advantage goal, customers' expectations of quality products, operations and business performance, green reputation, and stakeholders' environmental performance goals.

Like other best practices, lean management requires a concerted effort and commitment from everyone to improve results in all aspects of the organization (Arumugam, 2022). Many lean initiatives fail because, often, lean managers focus so much on the application of lean on the production floor that they forget the human aspect of lean (Lim et al., 2022). Lean efforts will not yield good results if the implementation does not include sustainment strategies (Kovacs et al., 2020). Lim et al. (2022) expressed that managers must implement lean tools and techniques and the human aspect of lean for successful lean implementation. Implementing lean requires the involvement and support

of the lean team and the development of the human factor, including employee learning and development (Lim et al., 2022). Abdallah et al. (2021) concluded that many LM efforts fail because the managers either focus on either the human-related (social) LM practices or on technical (hard) LM practices instead of focusing on both simultaneously. Many managers fail in operations management due to the issue of balancing between human and technical aspects of operations.

Yadav et al. (2019) stated that researchers have proven that implementing lean practices positively impacts organizational performance. Researchers have demonstrated that LM and innovation are two of the most strategic options to increase a company's competitiveness over its rivals (Abdallah et al., 2021). For example, applying a lean Six Sigma framework to a medium-sized aerospace manufacturing firm in the United Kingdom improved financial performance: a 26.5% increase in on-time delivery and a 20.5% reduction in build time (Abdallah et al., 2021). Companies that practice lean manufacturing as opposed to traditional manufacturing adopt box scores; also known as lean accounting (Arai, 2021). Managers achieve lean accounting using financial and non-financial measures to understand the effects of the LM practice. According to Grasso and Tyson (2021), researchers demonstrated that conventional management accounting reporting, especially standard cost reporting, could seriously hinder lean manufacturing management.

Arai (2021) concluded that lean manufacturing companies use many nonfinancial performance measures, such as product defects, on-time delivery, and the number of

customer complaints, to manage lean manufacturing. However, researchers have also proven that lean manufacturing relates to financial accounting. For example, Arai emphasized that using profit information encouraged the interdependency between shop floors in JIT production. JIT production is a lean practice that promotes employee empowerment and transformation by delegating authority to employees (Arai, 2021). Delegating authority to employees was one of the core JIT practices of Toyota as opposed to General Motors (Arai, 2021; Arumugam, 2022; Lim et al., 2022). Many researchers have proven that change in a company's structure to accommodate lean manufacturing initiatives is the key to success in LM management (Kalyar et al., 2019).

Kaizen as OM Tool

According to Berhe (2022) and Cannas et al. (2018), Masaaki Imai, in 1986, introduced kaizen in Toyota to improve efficiency, productivity, and competitiveness. Managers and business leaders continue to adopt new measures, philosophies, or strategies to maximize operational performance by making processes more efficient, reducing costs, making operations faster, and improving customer service as the market becomes more aggressive and competitive. Kaizen, a Japanese concept translated as continuous improvement in Western culture, has been widely used and accepted in many industries and countries for over 30 years to increase employee participation, improve operations performance and customer service, and reduce costs (Berhe, 2022; Garza-Reyes et al., 2022). Alvarado-Ramírez et al. (2018) defined kaizen as a management approach involving all organization personnel in continuous learning and gradual

improvement of the organizational processes to gain a competitive advantage. Chan and Tay (2018) expressed a kaizen event as a structured continuous improvement project involving a dedicated cross-functional team to improve a particular area within a short time.

The philosophy of continuous improvement is based on strategically increasing a targeted variable's performance without jeopardizing other important ones (Cannas et al., 2018). Cannas et al. (2018) expressed kaizen blitzes as the team's intense improvement activities through increasing interaction and mutual dependency, improving employee motivation and job satisfaction. Companies use kaizen blitzes to identify, analyze, and solve work-related problems while monitoring the outcome over time to improve production processes (Cannas et al., 2018). Kaizen takes a collective effort of a cross-functional team, and Franken et al. (2021) expressed that continuous improvement approaches involving multidisciplinary groups seldom fail if managed well. Improvements involving a group are hard to manage, and researchers show that group efforts often lack effectiveness (Franken et al. (2021).

Kaizen encourages daily improvements in every area of the organization by everyone in the organization. Cannas et al. (2018) added that the kaizen philosophy involves everyone coming together to make improvements without significant capital investment involvement. This means that all departments (management and subordinates) must participate in continuous improvement initiatives daily in all the organizational sections. Implementing kaizen involves applying LM tools to a specific area of the

organization by a cross-sectional team to achieve a particular goal in a short period (Chan & Tay, 2018; Garza-Reyes et al., 2022). Garza-Reyes et al. (2022) explained that during continuous improvement, the cross-sectional team must develop time consciousness as these projects must be accelerated. Various businesses adopted kaizen for multiple reasons, including improvement schemes, waste reduction programs, and a driver for applying lean manufacturing management tools such as the West's total quality management or Japanese company-wide quality control and TPS (Berhe, 2022; Cannas et al., 2018). Even though kaizen can be applied to all businesses and personal life, it is a management approach that improves the manufacturing processes by ensuring excellence and operational innovation in the field of manufacturing.

Transition

In Section 1, I discussed manufacturing companies' strategies to implement manufacturing systems that improve performance. The literature review contains the background of manufacturing businesses' strategies to implement efficient systems to improve performance. The first part of the review contains background information on the framework that shaped this study. In the second part of the review, I explained some of the efficient strategies that help manufacturing companies improve their performance in this challenging, dynamic, and global market. Section 1 contains details on the study problem. Section 2 will have the background information on the research, such as (a) purpose statement, (b) role of the researcher, (c) participant, (d) research method, (e) research design, (f) population and sampling, (g) ethical research, (h) data collection

instruments, (i) data collection technique, (j) data organization technique, (k) data analysis, and (l) reliability and validity. Section 3 will contain the research findings and professional practice application.

Section 2: The Project

In this section, I explain the study's scope in detail. A qualitative researcher serves, among other roles, as the primary instrument for data collection and analysis. In this section, I also present the research method and design of the study and how data were collected, organized, and analyzed for this study, including providing a description of how participants were selected using purposive sampling, the strategies used to interview the participants, and how the interviews were transcribed and analyzed for meaning. The sections also contain a discussion of the ethical requirements of a qualitative researcher, the rights of the participants and their families being treated as confidential, and the procedures for achieving ethical soundness throughout the interview process. In the section, I explain the use of data triangulation and member checking as methods of reaching data saturation, validity, and reliability.

Purpose Statement

The purpose of this qualitative single case study was to explore the successful strategies U.S. managers use to implement efficient manufacturing systems to improve their companies' performance. The targeted population comprised six managers of a manufacturing company in Tennessee, in the southeastern part of the United States, who had used successful strategies to implement efficient manufacturing systems to improve their companies' performance. The positive social change implications of this study are the economic wealth and improved employment opportunities successful manufacturing

companies will offer society as well as an increase in foreign investors who may want to invest in U.S. manufacturing if the businesses become more prosperous.

Role of the Researcher

A researcher plays one of the most vital roles in the success of a study. Qualitative researchers use knowledge from previous studies to understand the current research subject (Astroth & Chung, 2018; Yin, 2018). I have worked in manufacturing operations for over 10 years and understand the difficulty of choosing the best strategies to implement efficient manufacturing systems to improve the company's performance. In this industry, managers are faced with the challenges of selecting the best strategies, systems, or processes amidst challenging options, such as cost of implementation, workforce barriers, technological challenges, and financial considerations (Yang & Yang, 2019). A qualitative researcher has several roles, including (a) making an effort to understand the meaning the participants deduced from their experiences and the world around them, (b) being the primary data collection and analysis instrument, (c) inductively approaching meanings participants constructed based on their experiences, and (d) descriptively conveying the product of the research (Merriam & Grenier, 2019; Mohajan, 2018; Yin, 2018). Mohajan (2018) added that a qualitative researcher tries to observe and understand the meaning a participant attributes to a real life day-to-day experience in a natural setting. The qualitative researcher must understand the meaning made in the study from the participant's point of view, which may be complex because of

possible biases of the researcher during interviews and that arise during other steps in the research process (Merriam & Grenier, 2019).

Merriam and Grenier stated that the researcher must isolate and eliminate biases and their effects during the interview and interpretation processes. These biases may have arisen in the current study due to my experience and background in the manufacturing business. The values I hold as an operations manager may have also influenced the data collection and interpretation process. To mititgate bias, the researcher must set aside their experience during these processes to avoid affecting the participants' views and the results. As the researcher, I did not judge the participant's processes and strategies based on my experiences; instead, I interpreted the processes based on the participant's experiences. During the interview process, I took interview notes and audio recorded each interviewee, then wrote a verbatim transcript to mitigate my personal biases and judgments due to my experiences, values, and background. To avoid misinterpretation and personal influence over the interviewees' responses, I verified the validity of the responses and the interpretations through member checking, asking the research participants to review the interview transcripts and analysis results. According to Scherzinger and Bobbert (2017) and Bryman et al. (2008), the researcher is responsible for maintaining the validity and authenticity of the contents of the research.

I used the data collected from the participants and their organizations to investigate the research objective and stored the data in a password-protected external hard drive strictly under my control to maintain compliance with *the Belmont Report* on

ethical behaviors in research. Beauchamp (2020) and Lantos (2020) stressed the need for researchers to adhere to three basic ethical principles: respect for persons, beneficence, and justice. I ensured that the confidentiality of the participants and their families was protected during and after the research process and followed the protocols found in Appendices A–C when recruiting and interviewing participants, collecting data, and maintaining the fair and ethical treatment of the participants. I developed the research question and interview questions to align with the research objective and participant feedback. Semistructured, open-ended interview questions were used to gain more insight into the participants' views and meanings regarding the research objective.

Participants

Shaw et al. (2020) reported that the participants' selection process is one of the most critical factors for successful research. Shaw et al. (2020) stated that one of the essential aspects of selecting participants in qualitative research is the researcher's responsibility to conduct the selection process and the research process as whole in an ethical and fair manner. I began the selection process after gained approval from the Walden University Institutional Review Board (IRB), ensuring that I met all ethical and procedural prerequisites. The IRB ensures that research participants' rights, privileges, and welfare are protected during the research (Dutka & Astroth, 2022).

The following sequence is used to secure participation in research studies: identifying potential participants, contacting them, and gaining their commitment (Burns et al., 2020). I have worked as a manufacturing professional for over 10 years. Over these

years, I have met other professionals who successfully used strategies to implement efficient manufacturing systems that improve their companies' performance. This research was a single case study, so the interview participants comprised managers of a single manufacturing company who had used successful strategies to implement efficient manufacturing systems that improved their company's performance. I identified possible participants through my professional colleagues. I contacted and started to establish rapport with the professionals who showed interest in the study. First, I followed up with a phone call and email to introduce myself and thank them for wanting to participate. Participants deserve the right to understand the interviewer's purpose, scope, and mode (Dutka & Astroth, 2022). The researcher cannot continue the study if the participant is unwilling to participate.

Before proceeding with the interview process, the researcher must obtain informed consent from the participants (Laine, 2000). I ensured each participant got an introductory interview package that included a consent form and an explanation of my intent and purpose to ensure the ethical treatment of the participants during the research process. I also confirmed that the data collected from the participants would be kept confidential and provided detailed instructions regarding the interview process so they could understand all the risks involved and give them the opportunity to opt-out if they chose to. The interview protocol is in Appendix A. Each participant also received detailed contact information for Walden University's IRB.

One of the values of research questions is the researcher's use of them as reference points in selecting participants (Puyvelde, 2018). Before moving further in the selection process, I used the research question I constructed for the study as a basis in choosing the participants. The research question was: What strategies do U.S. manufacturing managers use to implement efficient manufacturing systems that improve their companies' performance? In alignment with the research question, participants were managers of a single manufacturing company who had used successful strategies to implement manufacturing systems that improved their companies' performance.

I used the purposive sampling strategy to screen potential research participants. Purposive sampling is a nonprobability sampling technique where participants are selected if they meet the characteristics defined by the researcher (Ames et al., 2019). Ames et al. (2019) suggested that purposive sampling is used when a researcher wants to include the most qualified participants to reach saturation quickly. The eligibility requirements used for participant selection were (a) the participant must be a manager in the study site manufacturing company, (b) this manager must have worked in this role for at least 1 year, (c) the role of the manager must involve selecting and/or using proven strategies to implement efficient manufacturing systems that improve the company's performance, and (d) the manager must be current in this position. I reached saturation after interviewing six participants.

The researcher must exhibit behaviors that make the participants trust and believe that the researcher is knowledgeable about the phenomenon being researched (Ames et

al., 2019). To establish trust in my professional knowledge of the topic, I shared my experiences in manufacturing operations with the participants. I chose the geographical area of Tennessee for convenience since I reside in the southeastern area of the United States. During the initial steps of the recruitment process, I also shared my educational background with each participant to assure them that I was knowledgeable in this field.

Research Method and Design

A researcher determines what type of data to seek based on the method and design of the research. The processes of collecting, organizing, and analyzing the data must reflect the method and design of this research. I employed a qualitative single case study design in the current study.

Research Method

Edmonds and Kennedy (2017) expressed that in qualitative research, the researcher seeks to find meaning by exploring the systems, focusing on human behaviors and the reasons behind these behaviors around the systems. Qualitative researchers use the inductive process to examine phenomena in their natural setting using words instead of data (Guetterman, 2018). The researcher must be aware that biases may occur and that they are part of the process and must be cognizant of their ontological and epistemological stance regarding the research framework (Edmonds & Kennedy, 2017). Guettermna (2018) stated that one of the benefits of using a qualitative approach over mixed and quantitative methods is the minimal data manipulation and control because a qualitative researcher studies the participant in the participant's natural setting through

the researcher's voice. My aim in this study was to gain an in-depth insight into the strategies U.S. managers use to implement manufacturing systems to improve their companies' performance through the participants' narratives. Using the qualitative method, I studied the subject deeply to understand efficient manufacturing systems and their effect on manufacturing. Qualitative researchers are profoundly concerned with data collection, techniques, tools, and analysis as well as maintaining an ethical research process (Kekeya, 2021).

Barnham (2015) posited that quantitative research is used to measure numbers and deduce facts within a given constraint of a given sample, while qualitative research is used when an in-depth understanding of a given subject in a natural setting is required. In quantitative research, the researcher uses already made formulas and assumptions to estimate results (Edwards, 2020). A mixed-method approach integrates quantitative and qualitative methods and shows their interdependence in understanding the business problem being researched (Cook et al., 2019).

The nature of this study warranted that I explore the phenomenon under study in its real-life context; in this case, the managers and the manufacturing companies where these manufacturing systems and strategies are utilized were the real-life contexts. I objectively found the means of successfully explaining the strategies these managers use to implement efficient manufacturing systems through qualitative research. The quantitative and mixed-method approaches were not suitable methods for the current study because these methods are utilized when the researchers deal majorly with theories

(see Cook et al., 2019). The mixed method was not appropriate for this study because quantitative data was not needed to address the research question.

Research Design

Qualitative researchers choose from five qualitative research designs (i.e., narrative, phenomenological, grounded, ethnographic, and case study), depending on the central objective of their research (Petty et al., 2012; Valtakoski, 2020). Each of the five designs leads to a different end. The narrative design was unsuitable for this study because narrative researchers are focused on the story or characteristics of an individual or individuals under study (see Valtakoski, 2020). When using a phenomenological design, the researcher focuses on one or more individuals to explore a single phenomenon and then collects data from the individuals who experienced the phenomenon (Petty et al., 2012; Valtakoski, 2020). The researcher brackets their when using a phenomenological design to focus on only the participants' views to form an essence at the end. Yin (2014) expressed that in the grounded theory design, the researcher develops a theory to explain an action or interaction. Grounded theory was not appropriate for this study because the focus of this research is not to discover new theories that are based on collection and analysis of data. The ethnographic research design centers on how a member of a cultural group converges in behavior, actions, and talking over a period of time (Petty et al., 2012; Valtakoski, 2020; Yin, 2014). This study was not centered on cultural development, so an ethnography was not a suitable design for the study. According to Petty et al. (2012) and Yin (2014), the narrative design and ethnography are

used when a researcher wants to develop a portrait of an individual or a cultural group, respectively. Phenomenology is most appropriate when the researcher is interested in exploring the experiences of individuals about a phenomenon, while a case study is most appropriate when the question involves describing a case (Petty et al., 2012; Yin, 2018).

In a case study design, the investigator selects a case (i.e., single case study) or multiple cases (i.e., multiple case study) and explores how the case or cases illustrate a problem or an issue (Creswell et al., 2007). The case in this study was the strategies the U.S. managers use to implement efficient manufacturing systems to improve their companies' performance. Yin (2018) reported that a case study is used when a researcher wants to investigate a contemporary phenomenon within its natural, real-life context. A case study was the most appropriate design for the current study because the boundaries between the phenomenon and context were unclear. In other words, in this study, I went to the selected company and interacted with the managers who choose, develop, and use the strategies to implement the efficient manufacturing systems being researched. Even though some researchers promote the use of multiple case studies over a single case study, Yin (2014) and Houghes and McDonagh (2017) agreed that a single case study is associated with the collection of rich data due to its focus on just one research site. In this study, the research question set the foundation through which the best design for this research was selected (see Petty et al., 2012). The researcher is the main instrument for data collection, interpretation, and reporting in qualitative case study research, which

means that they must acknowledge and monitor their impact on the research process and outcomes (Simons, 2009).

Cleland et al. (2021) posited that a case study is used when the researcher wants to thoroughly investigate single or multiple phenomena set in real life and bound by time and space. Furthermore, the researcher aims to develop an in-depth understanding of the relationship between the research object and its context. A case study is suitable in cases where the study focuses on answering the why and how questions and the participants' behaviors cannot be manipulated. This study focused on answering why and how manufacturing managers choose strategies to implement efficient manufacturing systems to improve their organizations' performance. The phenomenon in this study was relevant because manufacturing is vital to the United States. and the world economies. For a case study to be used instead of the other types of qualitative designs, there must be a study case; the case must be bounded by time, space, and activity, studied in context, receive in-depth study, must reflect the purpose and condition of the study, and must have multiple sources of evidence (Cleland et al., 2021; Mishra & Dey, 2021).

I interviewed managers of one manufacturing company and reached data saturation after six participants were interviewed. The researcher reaches data saturation when no new concept emerges during the data collection process in qualitative research (Feng et al., 2021). Many researchers agree that data saturation is the best justification for proper sample size in qualitative research (Buckley, 2022; Hennink & Kaiser, 2022). Yet, there has not been any detail on how and the ground to attain data saturation. There is no

general rule on data saturation sample size in qualitative research; however, Hennink and Kaiser (2022) emphasized that it is a good practice for researchers to attain data saturation by high quality and high-quantity data collection. Instead of increasing the number of participants to meet a self-created quantity goal, selecting the participants that are the best fit for the research using sampling techniques should be a better goal of the researcher (Ames et al., 2019; Buckley, 2022; Hennink & Kaiser, 2022).

Buckley (2022) suggested that the sample class should be defined before the interview of the participants, and Ames et al. (2019) suggested that purposive sampling requirements should be created to select the best fit. I used purposive sampling to select the most qualified participants based on the purposive sampling requirements I created before the interview started. I screened the managers that were interested in participating using the criteria I created for purposive sampling, namely, (a) the participant must be a manager in a manufacturing company, (b) this manager must have worked in this role for at least 1 year, (c) the role of the manager must involve selecting and using proven strategies to implement efficient manufacturing systems that improve the company's performance, and (d) the manager must be current in this position. I used triangulation to enhance my data saturation process. Triangulation involves using multiple data sources to ensure data saturation, validity, and reliability (Feng et al., 2021; Sebele-Mpofu, 2020). A good selection process and use of multiple data sources speed up the saturation point (Buckley, 2022; Hennink & Kaiser, 2022; Sebele-Mpofu, 2020). I used available company documents and other published articles for triangulation.

Population and Sampling

Defining the Population

The targeted population of the research comprised six managers of a company in Tennessee, in the southeastern part of the United States, who used proven strategies to implement manufacturing systems to improve their company's performance. I chose the purposive sampling method, a nonprobability sampling technique, to sample the managers of a company who meet the eligibility requirement of this study. The sample included managers who have been in their roles for a minimum of 1 year in a manufacturing company. These managers had direct experience using proven strategies to implement efficient manufacturing systems that improve their companies' performance.

Sampling and Data Saturation

Adebayo and Ackers (2021) defined population sampling as sampling involving selecting a fraction of a group, cases, or participants to represent the entire population to generalize the population based on this selection. This definition makes it essential to learn the best techniques to select the most appropriate samples to represent the population. One of the important jobs of a researcher is to figure out what kind of sampling is required to make desired research decisions. The researcher determines the sampling method based on the research method. For instance, Sarstedt et al. (2018) and Buckley (2022) expressed that the researcher must make an informed decision on whether to use a probability or nonprobability sampling method. In a nonprobability

sampling method, in contrast with probability sampling, whose selection process is random, the researcher's judgment and convenience are the main factors; as a result, the sampling population is more restricted than the target population making the selection probability of the sampling units unknown (Sarstedt et al., 2018). Examples of nonprobability sampling are purposive, quota, and convenience sampling.

Most qualitative researchers adopt nonprobability sampling because qualitative, unlike quantitative research, deals with words rather than formulas and data (Adebayo & Acker, 2021; Sarstedt et al., 2018). Purposive and convenience sampling were the most accurate methods for this single-case qualitative study. In a convenience sampling method, the researcher locates participants based on the convenience of their locations to the researcher rather than any other criteria (Sarstedt et al., 2018). An example of convenience sampling is snowball sampling. In purposive sampling, the researcher predesigns the criteria for selecting the participants depending on the studied object. The researcher uses the researcher's judgment and expertise to choose the participants while ensuring the elements included in the selection process are those appropriate for analyzing the case or phenomenon under study (Adebayo & Acker, 2021; Sarstedt et al., 2018).

This research was a single case study involving six managers of a single manufacturing company in Tennessee, in the southeastern part of the United States. To identify the potential company and the managers of this company, I initially contacted several companies, and in the end, I chose one company that best met my eligibility

criteria. First, I met and sent emails to manufacturing companies' managers in Tennessee, in the southeastern part of the United States, who opted to participate and then screened them to get the best fit. I reached out to as many managers of each company as possible to increase my chances. I also reached out to my professional contacts to see if they knew managers of a company that met my research eligibility criteria and were willing to participate. I specified that these managers must work for one company since my research was a single case study involving one company.

I identified and contacted the managers to discuss the interview processes, including the screening process. Those who indicated interest went through my purposive sampling process. In this research, I used the purposive sampling eligibility criteria in Appendix A to prescreen the potential participants. Each potential participant underwent the prescreening by meeting my purposive sampling eligibility requirements: (a) the participant must be a manager in a manufacturing company, (b) this manager must have worked in this role for at least 1 year, (c) the role of the manager must involve selecting and (or) using proven strategies to implement efficient manufacturing systems that improve the company's performance, and (d) the manager must be current in this position. Those who qualified based on the elements used for the purposive sampling proceeded to answer the interview questions I have created.

I used triangulation to reach data saturation by reviewing other valuable company public data, such as policies, procedural information, and process documentation, with the approval of the company leaders. Data saturation, in research with interviews as its

primary data collection source, entails adding new participants to the point of data replication or redundancy or until no further information is found (Marshall et al., 2013). Data saturation is elusive because there is no concrete guideline on sample size estimation (Adebayo & Acker, 2021; Boddy, 2016).

Many researchers agree that sample size does not directly correlate with data saturation in qualitative research (Adebayo & Acker, 2021; Boddy, 2016). Hennink and Kaiser (2022) emphasized that it is a good practice for researchers to attain data saturation through high-quality and high-quantity data collection. The quality of the samples can affect the data analysis and results. Multiple researchers agree that there is no set rule on sample size to reach saturation; data saturation indicates good work in a qualitative study (Hennink & Kaiser, 2022; Marshall et al., 2013). The researcher should set a high standard for selecting the researcher's participants since the selection process can affect the quality and quantity of the data collected and may also affect the validity (Hennink & Kaiser, 2022).

Selecting only the participants who met the selection criteria to participate in this research enhanced the research saturation. Triangulation involves using multiple sources to understand the case under study, and triangulation helps the researcher obtain data saturation (Marshall et al., 2013). In this study, I used the criteria I created earlier to select my participants. Those who met the eligibility requirement were interviewed using a semistructured open-ended, face-to-face interview to elicit the strategies they use to implement manufacturing systems to improve their company's performance. I reviewed

and compared available organizational data, such as procedural documentation and policies information relevant to the study, with the interview data. I also collected and reviewed relevant information on the study subject from reputable online sources to add more weight to the research until I reached data saturation.

Ethical Research

The National Research Act passed on July 12, 1974, contains the Belmont Report, which outlined ethical principles and guidelines encompassed in the 1991 U.S. Department of Health and Human Services regulations for protecting human research subjects (Beauchamp, 2020). Department of Health and Human Services' summary of the three basic ethical principles of the Belmont Report incorporated as the basis for U.S. research policy are (a) respect for persons: which emphasizes that research subjects must be respected; and allowed to function freely and independently and those who can't function freely and independently must be protected, (b) beneficence: which emphasizes that ethical principles to protect the subjects from any possible harm while maximizing benefits must be upheld, and (c) justice: which ensures that all subjects are treated equally in research methods, burdens, and benefits (Beauchamp, 2020; Brear & Gordon, 2021; Lantos, 2020). These three basic principles were reflected throughout the processes of this research paper. A researcher's role is to ensure participants are treated fairly and equally in a safe research environment that ensures the participants' confidentiality is protected (Beauchamp, 2020).

I only contacted or commenced interviews with any participant once I secured Walden University IRB approval for this study. Walden University's ethics approval number for this study is 03-22-23-0590042. According to Yin (2018), the researcher must obtain any required institutional approval before proceeding. I published and shared the board's approval with the participants confirming the approval with the approval number assigned to me. The researcher is expected to assure the participants of their freedom to decline or participate in research, that they have the right to withdraw from the research at any point without any penalty, and that their confidentiality is protected through a consent form and confidentiality statement (Kaewkungwal & Adams, 2019; Yin, 2018). As the researcher, I provided a written consent form and confidentially statement to all participants and asked for their written consent to participate by email. In the informed consent form, I established that there was no award of financial compensation for participation. I used the consent form to declare the study's purpose, scope, and benefit. A consent form is supposed to be used in convincing and confirming compliance with ethical conduct, including the protection of the right, confidentiality, and safety of the participants (DeLorme et al., 2001; Xu et al., 2020). In the consent form, I specified to the participants that I was going to audio record and take interview notes during the interview process.

Scherzinger and Bobbert (2017) maintained that the researcher should not interpret the participants' responses from the researcher's point of view. One of the common mistakes in research is the researcher's judgment of the participants rather than

interpreting the participants' views or answers to maintain validity and authenticity (Bryman et al., 2008). In compliance with the established ethical soundness of research, I did not judge the participant's processes, viewpoints, or strategies based on my experiences; instead, I set my experience and viewpoints aside and interpreted the processes based on the participant's experiences and perspectives. During the interview process, I took interview notes, audio recorded each interviewee, then wrote a verbatim transcript to mitigate personal biases and judgments due to my experiences, values, and background; and these steps were communicated to the participants before the beginning of the interview through the interview protocol. To avoid misinterpretation and personal influence over the interviewees' responses, I verified the validity of the responses and the interpretations through member checking. I achieved member checking by asking the research participants to review the interview transcripts to mitigate bias due to misinterpretation or misrepresentation of the participants' views.

I used the information collected from the participants and their organizations to investigate the researched case and store the data in a password-protected external drive on my computer under my control to maintain compliance with *the Belmont Report* on ethical behaviors in research. Interview notes containing information related to the participants or their organization were locked in a safe locker to which I am the only one with access. I ensured that the confidentiality of the participants and their families was protected during and after the research process. Before the first interview, I also discussed the risks, rights, and other sensitive issues to make the participants aware and

ready. Throughout the research, I masked the names and private information of the participants and their organization from any third party, including Walden University and the public. I will destroy, by burning or deletion, every document related to the participant and their organization 5 years following the date of the completion of this study. Compliance with ethical codes and respect for the participants and their organizations are essential in any research involving human objects (Carey & Griffiths, 2017; Kaewkungwal & Adams, 2019; Yin, 2018).

It is also recommended that the researcher aligns the research questions with the research objective and the feedback from the participants (Yin, 2018). Using semistructured open-ended interview questions helps the researcher gain more insight into the participants' views and meanings regarding the research objective (Mohajan, 2018). I used the questions listed in the interview protocol as a guide to the interview. The questions were semistructured and open-ended interview questions to help the participants answer at their convenience and in completeness. Following this interview protocol enabled me to collect and analyze valuable information on the subject matter - the strategies these managers use to implement efficient manufacturing systems to improve their companies' performance.

Data Collection Instruments

Qualitative research is a form of data collection and analysis focusing more on finding meaning by exploring how and why systems are the way they are, focusing on human behaviors around the system, and exploring the reasons behind these behaviors

(Edmonds & Kennedy, 2017). Qualitative research is an inductive process used to examine phenomena or cases in their natural setting using words instead of data to understand the meaning people construct around their experiences in each situation (Guetterman, 2018; Mohajan, 2018). According to Merriam and Grenier (2019), Mohajan (2018), and Yin (2018), the roles of a qualitative researcher include (a) making an effort to understand the meaning the participants deduced from their experiences and the world around them, (b) unlike a survey or experiment, a qualitative researcher is the primary data collection and analysis instrument, (c) rather than deriving meanings deductively, a qualitative researcher is inductive in approaching meanings participants constructed based on their experiences, and (d) the qualitative researcher descriptively conveys the product of the research.

I was the primary data collection and analysis instrument in this qualitative single case research. The interview protocol in Appendix A of this semistructured interview was one of my instruments during the interview process. The data collection protocol, another instrument, is in Appendix B. I interviewed prescreened participants until I reached data saturation in a face-to-face interview. The participants were screened using purposive and snowball sampling techniques. The researcher uses the researcher's expertise and judgment to select the participants the researcher deems the best fit for the research in the purposive sampling method (Adebayo & Acker, 2021; Sarstedt et al., 2018). The purposive and convenience sampling techniques are nonprobability and nonstatistical data sampling techniques used in research in which the meanings of phenomena are

sought through interviews and other conceptual means that formulas and statistics are not the primary data (Adebayo & Acker, 2021; Sarstedt et al., 2018). As the name implies, convenience sampling is a method based on the researcher's convenience (Sarstedt et al., 2018). Convenience sampling, such as snowball sampling, is a nonprobability sampling method where the participants help the researcher recruit their friends, coworkers, or acquaintances (Adebayo & Acker, 2021).

The reason for screening the potential participants using the purposive sampling eligibility requirement was to make sure high quality and high quantity data was collected and analyzed to enhance the validity and reliability of the data collection. Data saturation, validation, and reliability are essential in qualitative research. Researchers use strict eligibility requirements during the selection process and data from multiple data sources to enhance their data saturation, validation, and reliability (Adebayo & Acker, 2021; Boddy, 2016; Hennink & Kaiser, 2022). Triangulation involves using multiple data sources to enhance the data saturation, validity, trustworthiness, credibility, and reliability of a research result (Buckley, 2022; Feng et al., 2021; Hennink & Kaiser, 2022; Sebele-Mpofu, 2020). I collected fourteen available company documents for review and comparison with the interview data with the approval of the company leaders. In addition to the participants' responses, using any company documents relevant to the research phenomenon, such as policies, metrics, financial results, process procedural documents, or information from the internet, enhanced the validity and reliability of the research. My document collection protocol, shown in Appendix B, was my third data collection

instrument. I included data from trustworthy internet sources that contained valuable information on the strategies manufacturing managers use to implement efficient manufacturing systems in the study.

Data Collection Technique

The researcher is the primary data collection instrument in qualitative research (Merriam & Grenier, 2019; Mohajan, 2018). As the primary data collection and analysis instrument, I collected data from prescreened participants through a live in-person interview. While it is easier to establish a rapport between the interviewee and interviewer in live in-person or face-to-face interviews because of the evidence of verbal and nonverbal communication, it is more economical, time efficient, and easier to record and save interview without additional external tools in live remote methods such as Zoom, TeamViewer, and Skype (Siedlecki, 2022). For this research, I conducted face-to-face interviews with the six selected managers of a manufacturing company. According to Mwita (2022), a data collection technique is a means, tool, or method a researcher chooses to collect data in a research project. Data collection is a sensitive and vital aspect of research because it involves gaining access to valuable information that may be essential to the study's success (Mwita, 2022).

The interview protocol I used as one of the instruments during the interview process is in Appendix A of this study. I interviewed six prescreened participants and reached data saturation. According to Hughes and McDonagh (2017), Petty et al. (2012), and Mwita (2022), depending on the nature and scope of the research, a qualitative study

researcher uses one or more of several data collection techniques: interviews, focus groups, observations, organizational documentation, archival records, and physical artifacts. As a qualitative researcher, I collected data on U.S. manufacturing managers' strategies to implement efficient manufacturing systems to improve their companies' performance. My main objective for this data collection was to explore the strategies U.S. manufacturing managers use to implement efficient manufacturing systems to improve their companies' performance.

Interviews, as the most used data collection technique, are the exchange between the interviewer and the interviewee, which starts when the interviewer asks the interviewee a question or questions to gather information regarding a particular subject, topic, case, phenomenon, or experience (Ballena, 2021). Ballena (2021), Price (2022), and Mwita (2022) posited that semistructured interview questions are the most used among the three forms of interview questions, namely, structured, unstructured, and semistructured interview questions in qualitative research. I chose open-ended questions for this interview to ensure that the interviewees give detailed responses regarding their viewpoints on the subject researched. I selected these questions to ensure that the participants were not coerced to give responses; they elaborated on their answers freely. Using semistructured open-ended interview questions helps the researcher gain more insight into the participants' views and meanings regarding the research objective (Mohajan, 2018; Petty et al., 2012). Researchers use semistructured interview questions that are open-ended to enable the participant to explore, internally, their experiences and

viewpoints and to give in-depth information regarding the subject being researched (Ballena, 2021; Mohajan, 2108; Petty et al., 2012; Price, 2022). Semistructured questions are flexible and enable the researcher to have the opportunity to ask more questions on top of the predetermined questions (Mwita, 2022). Petty (2012) emphasized that the appropriate time for an interview should be between thirty and ninety minutes. I specified in the interview protocol, in Appendix A, that the interview of each participant will take between thirty to ninety minutes to complete.

The researcher should design the interview protocol to allow the interviewer and the interviewee to bond and maintain a great rapport with one another (Isaac, 2014). Isaac (2014) suggested that the interview protocol should be a relaxed and conversational style to enable the participant to relax and freely express the participant's viewpoints in the most honest and accessible ways while the interviewer still maintains firmness in leading the interview process through the interview questions. I made the participants relax and the interview process conversational to strike a good rapport between the interviewee and me. I did not impose any questions or ideas on the participants. The interview started with an intent and purpose declaration, as illustrated in the interview protocol in Appendix A. Then, I emphasized the ethical grounds of the interview process. I read the research question and then asked each participant the semistructured and open-ended interview questions to maintain consistency. Each interviewee was notified that the interview will be audio recorded, and I will take interview notes during the whole process to enable a verbatim translation of the interview. It is recommended that the interviewer

records the interview to enable the interviewer to stay engaged and focused on the interviewee during the interview (Harvey, 2011).

After the interview, the researcher interprets the interviewees' responses using the audio recorded for verbatim translation (Ahern, 2012). As the researcher, I produced a verbatim translation of each interviewee's responses and return it to the interviewee for review, as illustrated in the interview protocol in Appendix A. The member checking ensures that the participants' views are represented appropriately and validates the interpretation of the data being collected (Candela, 2019). Birt et al. (2016) stated that member checking is essential to ensure the transcript's credibility and the researcher's transparency. Member checking is an important step in the qualitative study because it ensures the interviewee can add, cancel, or correct the interviewee's responses (Birt et al., 2016). I sent the transcript via email to each participant for review and indicated that the participant had up to one week to finish the review. Each of the participants consented and confirmed or corrected their views before I proceeded to the analysis and findings.

Data collection is a systematic process of gathering information a researcher or researchers need to answer research questions or validate a hypothesis (Mwita, 2022). It is important to ensure data richness, saturation, validity, and reliability through data triangulation (Hughes & McDonagh, 2017; Mwita, 2022; Petty et al., 2012). Triangulation is using other data sources to compare and increase the credibility of the research (Petty et al, 2012). Hughes and McDonagh (2017) and Yin (2014) suggested that company document review is essential in supporting and substantiating the primary

interview data. I reviewed available company public documentation to supplement and substantiate the interview data. I collected the document information using the data collection protocol in Appendix B.

Data Organization Technique

Once I secured a place (company) and participants for the interview, my organization technique for this study included audio recording each participant during the interview using an iPhone for clarity and easy conversion to MP4 and transfer, keeping a reflective journal during the interview process, member checking to ensure validity and avoiding misrepresentation of participants' responses, and transcribing the interview. Zamawe (2015) advised that interviews should be audio-recorded for accurate translation. I conducted face-to-face interviews with the participants and recorded the interviews on my laptop as a backup for easy transcribing. All the journal notes and transcripts were organized using alphanumerical labeling.

I masked all the participants' names and other company vital profiles. To ensure confidentiality, I used a code system such as participant P1P1 or company XYZ to refer to the participants and companies, respectively. After the interviews, I transcribed each interview and sent the transcript via email to each participant for member checking to avoid misrepresentation of their viewpoints and to validate the data. Member checking is essential to ensure the participants' views are represented appropriately and to validate the data collected in qualitative research (Candela, 2019). After collecting the data, the next step was to organize the data. Each participant's interview response was transcribed,

and member checked, and I used NVivo software for easy thematic coding of the transcript to hasten up the coding process. NVivo software is one of the software qualitative researchers use for data organization and analysis (Zamawe, 2015). Thematic analysis is one of the ways a researcher analyzes qualitative data. A qualitative researcher uses a descriptive method called thematic analysis to reduce the data, such as interview transcripts, flexibly by identifying, analyzing, and reporting patterns or themes (Castleberry & Nolen, 2018). I used this software to identify response patterns and group them for easy analysis. Due to the substantial amount of conceptual data involved with thematic analysis, researchers often use software programs collectively called computer assisted qualitative data analysis, such as NVivo, to facilitate the analysis (Castleberry & Nolen, 2018; Zamawe, 2015).

One of the essential parts of the research process is ensuring the confidentiality and safety of the research objects (Beauchamp, 2020; Brear & Gordon, 2021; Lantos, 2020). Furthermore, Beauchamp (2020) emphasized that the researcher's role is to ensure that participants are treated fairly and equally in a safe research environment that protects participants' confidentiality. As the researcher, I ensured that the participants and company’s profiles and sensitive information were confidential. There was no physical injury risk involved in the interview process because all the interviews were conducted live in person in a secure location chosen by the participants, with no injury risk involved. No participant was coerced to provide information against the participant’s wish. The paper version of the journal notes and any valuable company public

information collected was locked in a safe that only I can access. At the same time, all the other electronic data, including interview recordings and transcripts, were saved in a password protected folder on my personal computer and iCloud as a backup. The paper and the electronic versions will be destroyed and deleted after 5 years from the date Walden University approves the completion of this study.

Data Analysis

Isaacs (2014) reported that the interviews' transcripts form the data analysis base in qualitative research. Data analysis is the researcher's actions to make meaning of the data collected, such as the interview transcripts. The data analysis method the researcher chooses depends on the data that needs to be analyzed (Issacs, 2014). In the case of this study, interview transcripts and company documents were the data I analyzed. I used methodological triangulation as one of the methods of data analysis. Methodological triangulation is the researcher's use of multiple methods to collect and analyze more complete and detailed data (Buckley, 2022; Feng et al., 202; Hennink & Kaiser, 2022; Sebele-Mpofu, 2020). I compared the interview transcripts with the company documentation to better understand the phenomenon and validate the interview data.

Abdalla et al. (2018) and Farquhar et al. (2020) posited that triangulation is not just a method for examining the data from different sources but also helps deepen the understanding of the researched matter. Researchers use triangulation to establish the validity of their research by relying on multiple data sources to reach a convergent conclusion (Farquhar et al., 2020; Feng et al., 2021). The importance of using

methodological triangulation is that it raises the validity and reliability of the research, and it is used to introduce new viewpoints to increase knowledge (Abdalla et al., 2018; Farquhar et al., 2020). Abdalla et al. (2018) further explained that illustration, convergent validation, and analytic density or richness are the three major values of triangulation in research.

It is recommended that a qualitative researcher audio records and takes notes during the interview process and then transcribes the recordings and journal notes by going back and forth between the interview transcripts, notes, and recordings until all points are captured (Kekeya, 2021). The researcher must constantly refer to the research question and compare it with the transcribed data, study aim, and theoretical framework to ensure that the researcher is still on course (Mohajan, 2018). For this research, I used thematic analysis for data analysis. Ayre and McCaffery (2022) explained that thematic analysis is used to reduce textual data to codes, and the type of thematic analysis utilized depends on the type of data the researcher is trying to reduce to codes. Thematic analysis is a descriptive method of data analysis the researcher uses to reduce the data, such as interview transcripts, flexibly by identifying, analyzing, and reporting patterns or themes (Castleberry & Nolen, 2018; Petty et al., 2012).

According to Castleberry and Nolen (2018), this stage in the analysis is where codes are assigned to segments of the data that describe them. Normally, the researcher reads through and combines codes whose meanings are close to each other. After coding, the researcher then categorizes codes that are related or have some resemblances into

themes (Castleberry & Nolen, 2018; Petty et al., 2012). This stage can be rigorous, especially because qualitative analysis involves a lot of textual data from different sources. Due to the substantial amount of conceptual data involved with thematic analysis, researchers often use software programs collectively called Computer Assisted Qualitative Data Analysis Software, such as NVivo, to facilitate the analysis (Castleberry & Nolen, 2018; Zamawe, 2015). Thematic analysis can be done using NVivo. Researchers use NVivo software to make this analysis stage very fast and reliable (Zamawe, 2015). The researcher uses this software to link parts of various documents, such as the interview transcripts and company documents and then codes them according to their relationships (Zamawe, 2015). Ayre and McCaffery (2022) explained that thematic analysis reduces textual data to codes; the thematic used depends on the type of data the researcher tries to reduce to codes.

Generally, there are five outlines in which qualitative data can be analyzed, namely compiling, disassembling, reassembling, interpreting, and concluding (Castleberry & Nolen, 2018; Yin, 2018). These five outlines can be easily achieved using NVivo software. Compiling involves breaking the data, such as interviews, into forms that are more meaningful, usable, and easy to access the contents such as interview transcripts (Castleberry & Nolen, 2018). Disassembling involves coding and grouping chunks of the data into codes that describe their meaning for easy analysis and interpretation (Yin, 2018). Reassembling is the process of grouping the codes into themes by collapsing codes that relate to each other into one theme (Castleberry & Nolen, 2018;

Yin, 2018). The researcher then interprets codes and themes by making analytical conclusions (Yin, 2018). Themes capture the elements of the case or phenomenon under study, and the researcher examines these themes to answer the research questions. Concluding involves responding to the research question and purpose of the study using the themes because the reason for gathering and analyzing data is to show that the experiences of the people being investigated have a relationship with the aim of the study (Castleberry & Nolen, 2018; Yin, 2018).

Reliability and Validity

Reliability

Rose and Johnson (2020) expressed reliability and validity in qualitative research in terms of trustworthiness, referring to the rigors of the research design, the credibility of the researcher, the believability of the finding, and the applicability of the research. Reliability, which refers to the dependability, consistency, or auditability of the study, is the extent of repeatability of the research and the understanding of the variations (Coleman, 2021; Petty et al., 2012). Reliability refers to the soundness of the study, especially concerning methods used during the research processes and the application of these methods in qualitative research (Rose & Johnson, 2020). This means the study should be replicable, meaning the same result should be arrived at if the research is repeated using the same participants or contexts (Abdalla et al.,2018).

The dependability of the findings of this research was the extent to which this research is repeatable if the same participants are used in the same context. In the case of

this study, dependability was achieved because the interview and data collection protocols in Appendixes A and C, respectively, were adhered to. Member checking or participant validation is the method of returning the interview transcript or data analysis to the participants for review to ensure the dependability and credibility of the interview (Birt et al., 2016). Member checking of the interview interpretation, review of the transcript, and data saturation through triangulation of the interview transcripts, company data, and other sources from reputable websites are different ways this study's dependability or reliability can be achieved. Coleman (2021) stated that triangulation of data helps in establishing reliability. The use of multiple data sources to enhance the data saturation, validity, trustworthiness, credibility, and reliability of a research result is known as methodological triangulation (Buckley, 2022; Feng et al., 202; Hennink & Kaiser, 2022; Sebele-Mpofu, 2020). In this study, triangulation was one of the means of achieving convergence of patterns to collaborate in the overall interpretation of the findings. Reviewing the company's information regarding the strategies the U.S. manufacturing managers use to implement efficient manufacturing strategies, researching published articles from peer reviewed online sources, and analyzing the interviews firmly established the integrity of this study.

To allow readers an audit trail in this research, I showed the rationale for this research, the protocols of the interview process, decisions made during the interview process, and the other salient steps in this research. The researcher's transparency throughout the research process is essential for helping the readers evaluate the reliability

of the study (Coleman, 2021; Leung, 2015). I made the processes involved in this research transparent to allow the easy auditing of the research findings. For example, I recorded the interviews and applied verbatim transcription to avoid interviewer biases; I member checked the interview transcripts with the participants to ensure the transparency and integrity of the study.

Validity

Validity refers to the extent the research study measures the purpose of the research (Abdalla et al., 2018; Kruth, 2015). Validity is the extent to which the researcher increases transparency and minimizes the introduction of bias in research (Kruth, 2015). The validity, which refers to the credibility, confirmability, and transferability of the study, means the extent to which a study can be believed by the participants and the degree to which it applies to other contexts (Coleman, 2021; Petty et al., 2012). As the primary instrument for data collection and analysis, I reduced bias and increased transparency by diligently sticking to the interview and data collection protocols in Appendix A and C. Researchers use triangulation to enhance the research's validity. Abdalla et al. (2018) identified that researchers arrive at a consistent objective picture of the reality of the investigated phenomenon using triangulation. Validity is void or minimizing of inconsistencies and contradictions in a research study (Abdalla et al., 2018; Petty et al., 2012). Barnham (2015) explained that the researcher's business is to give an account of how the participants see the world from the participants' points of view, irrespective of whether the view is correct or presents objective truth.

The researcher can achieve validity by comparing multiple data sources about the same phenomenon under study until there is a convergence of meaning from all the various data sources (Barnham, 2015). A qualitative researcher reaches validity when (a) the reality of the research is demonstrated, (b) the different data sources point to similar results, strengthening the data collection and analysis, and (c) data analysis density in breadth and depth is achieved (Abdalla et al., 2018). I achieved data validity for this research paper by following the interview protocols listed in Appendix A and the data collection protocol in Appendix B. I used methodological triangulation to reach validity by comparing the interview results with the company's documentation and other valuable information from reputable websites. Credibility is one of the proofs that the research is valid and that the study is trustworthy. Silva (2008) stated that the study's credibility entails that the research procedure provides criteria for judging the study's findings. This means that the qualitative researcher conducted the research in a way that the research phenomenon was identified and described. Coleman (2021) stated that recording an interview by the interviewer for a verbatim interview transcript enhances the credibility of the research. Member checking of the interview transcript reinforces the credibility of the research.

The next is the confirmability of the research, referring to the degree to which the findings reflect the participant's viewpoints and are void of the researcher's viewpoints and biases (Coleman, 2021, Silva, 2008). Follow-up questioning during interviews and member checking of the transcript can be used to achieve confirmability in the case of

this research study. In this research, each participant was allowed to member check the interview transcript to ensure transparency, originality, and ethical soundness and minimize the researcher's biases that may creep in due to the researcher's industrial and academic experiences. Triangulation is one of the techniques for achieving saturation and validity (Peterson, 2019). Triangulation was one of the techniques that was used to accomplish the confirmability of this research finding. For this research paper, multiple data sources were utilized during the data collection and analysis. Adhering to the research method, design, processes, and protocols published in Appendixes A to C of this study led to the confirmability of the findings. Confirmability of the research entails that another researcher or person should be able to confirm the research finding, owing to the research design.

Transferability refers to the degree to which the research findings can be applied to another context or setting (Peterson, 2019; Silva, 2008). The transferability of the research study refers to the degree of usefulness to others in an analogous situation. Silva (2008) posited that applying qualitative research results to other settings or people is challenging, making it a weakness in qualitative research. Others can determine the transferability of this research findings by adhering to the purposive sampling requirements, interview protocols in Appendix A, and data saturation through interviews and methodological triangulation.

Transition and Summary

Section 2 included the steps to conduct the study. It included details of the job of the researcher as the primary instrument for data collection, analysis, and interpretation. The rationale for choosing qualitative research as the method for this study was demonstrated. In this section, I discussed the rationale for choosing single case study design. The section also included valuable information on the ethical requirements for conducting qualitative research. *The Belmont* three basic ethical principles for research involving human objects are (a) respect for persons, (b) beneficence, and (c) justice. These principles will be applied throughout this research. In Section 2, details on how the researcher should and must maintain these principles were detailed. I discussed strategies such as member checking to avoid basis and misrepresenting the participants' viewpoints.

Section 2 included methods for choosing participants: purposive and convenience sampling techniques. The interview protocol was introduced and explained in Section 2. The requirements for the participants were explained before the interview. The interview protocol in Appendix A included consent information and other interview procedures. I explained the rationale for selecting open-ended semistructured interview questions for this study. Open-ended interview questions were chosen to allow the participants to elaborate on their viewpoints freely. This section included techniques for reaching saturation, such as triangulation. Information on the reliability and validity of the research, such as member checking and triangulation, were discussed in this section. I

indicated using NVivo software to facilitate the data analysis stage. Thematic analysis is the analytical method for this research.

In Section 3, the I will focus on presenting the study findings. In this section, the key themes from the data collected were compared with the conceptual framework in Section 2. I will make suggestions such as possible applications of this study to professional practice by discussing how business leaders can apply the findings to aid them in selecting the best strategies to implement efficient manufacturing systems that improve their companies' performance. The implications for social change of this study will be discussed in Section 3.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative single case study was to explore the strategies some U.S. managers use to implement efficient manufacturing systems to improve their companies' performance. Data were collected from face-to-face interviews with six manufacturing managers of Company ZYX (a pseudonym) in Tennessee, in the southeastern part of the United States. The data triangulation included the review of available and redacted company documents, such as metrics, financial records, quality documents, policies, and other published sources. The findings included that managers must be aware of the effect of their choice of manufacturing management systems on their overall company's performance. The strategies adopted and used by the leaders affect their internal and external competitiveness, manufacturing system, and the company's success. In Section 3, I present the findings, discuss the applications to professional practice and implications for social change, make recommendations for actions and further research, and conclude the study.

Presentation of the Findings

The overarching research question of this study was: What strategies do some U.S. manufacturing managers use to implement efficient manufacturing systems to improve their companies' performance? Using semistructured, open-ended interview questions (see Appendix A), I conducted face-to-face interviews with six manufacturing leaders in an aerospace manufacturing company in Tennessee. Each interview lasted

between 45 and 90 minutes. For data triangulation, I reviewed the collected data from the six participant interviews and 14 redacted documents from Company ZYX, including metrics, charts, financial documents, quality documents, and policies. The P1P1, P2P2, P3P3, P4P4, P5P5, and P6P6 were the designated alphanumeric codes for the six participants. The order of the designated codes does not reflect the order the interviews were conducted in for confidentiality purposes. Five main themes resulted from the data analysis: efficient manufacturing systems, successful strategies, operations management, leadership behaviors, and effects and competitive advantage. The themes, source files, and references are reflected in Table 2. Fundamentally, the themes relate to the conceptual framework of transformational leadership and the research topic.

Table 2

Themes From Interview and Company Documents

Themes	Number of files	Number of references
Efficient manufacturing systems	9	72
Successful strategies	10	138
Operations management	16	124
Leadership behaviors and effects	13	84
Competitive advantages	10	71

Efficient Manufacturing Systems

Efficient manufacturing systems emerged as one of the major themes during the data analysis. This theme had 72 references from the interview data and company materials. Even though all eight questions reflected on this theme, Question 1 was

constructed specifically so the participants could answer questions about the manufacturing systems they use. All six participants showed confidence in their systems and stated that their system is one of the major reasons they have successfully remained in business. They all indicated that their major system is very efficient.

According to Roy et al. (2018), manufacturing leaders use efficient manufacturing systems to deliver high-quality products with the least manufacturing costs. The responses of P3P3 and P5P5 are an indication that even though the Estate Planning Institute of Collaborative Resources (EPICOR) is the major system used by Company ZYX, there are other manufacturing systems present in the company. Some aspects of the company utilized different systems for efficiency reasons. For example, P5P5 and P3P3 stated that the quality department implemented several poka-yoke, a LM tool, in their inspection and several manufacturing processes in their quality and production departments.

According to the participants, they customized EPICOR as a central manufacturing system of the company and incorporated all their processes into this system. P1P1 explained that the company partnered with a university in Tennessee to configure its manufacturing system. Several other participants, such as P6P6, explained that the company had modified this system to what it is today over the years. P1P1, P2P2, P4P4, P5P5, and P6P6 identified two central systems: EPICOR and FlexNet. Five participants identified EPICOR as the company's main system to control their

manufacturing, operations, design, production floor, materials handling, and every other aspect of the company's business.

According to multiple participants, EPICOR is a material planning resource (MRP) and enterprise resource planning (ERP) software that the leadership team, over the years, developed into an elaborate manufacturing system of Company ZYX. The participants described it as being more than an MRP or ERP system. Based on the participants' responses, FlexNet is a homemade web-based quality management system used at Company ZYX to supplement EPICOR. P6P6 elaborated,

> We have two primary systems. One is a quality management system called FlexNet, which is a web-based program that was developed here at Company ZYX. The other one is called EPICOR, which is an ERP-type software, enterprise software for building materials, routers, work instructions, inventory, and timekeeping. So, we have two primary systems.

P1P1, P2P2, and P6P6 stated that they developed EPICOR due to the nature of their business. According to the participants, aerospace companies must comply with many rigorous standards to do business in this industry. In the case of Company ZYX, the company is AS9100 and ISO9001 certified, and it is easier to maintain these standards using EPICOR. Being one of the three companies that manufacture such products in the United States, Company ZYX's managers must develop a robust system that is used to tie all the aspects of the company together and to increase efficiency at all levels. P6P6 indicated that the company must be technologically ready to face the

looming competition in the aerospace industry. Three out of the six participants expressed that EPICOR is very useful because it is a comprehensive resource planning system.

After reviewing the interview data and all the available company documents, it became clear that EPICOR is the Company ZYX's ERP, MRP, and manufacturing system used in all aspects of manufacturing planning, material handling, product design phases, and the like. Yelles-Chaouche et al. (2021) asserted that a good manufacturing system incorporates all the aspects of the manufacturing operations of the manufacturing company. Company ZYX's customized EPICOR is used in all aspects of the company's business, including quality management, sales, customer relations, risk management, material handling, customer relations, production planning, operational measurement, and product and process development. P5P5 stated, "EPICOR controls all of our labor transactions or bills of materials, methods of manufacture, and counts of employees' clock-in and clock-out times."

P1P1, P2P2, P4P4, P5P5, and P6P6 emphasized that Company ZYX's manufacturing system is the most efficient compared to the others they have used in their past industrial experiences. P4P4 said that it would be hard to work in another environment that does not have a system that is as comprehensive. Three out of the six participants expressed that this manufacturing system is the most suitable for Company ZYX because of its low-volume and high-mix business model. P6P6, who has spent over 21 years in his role in Company ZYX and 30 years in the manufacturing industry,

expressed that the modification of EPICOR and use of it as a manufacturing system in Company ZYX is very beneficial, especially since Company ZYX is a low-quantity, high-mix product line business model. This participant also indicated that the low-quantity and high-mix business model is the normal business model in the aerospace industry. This participant further revealed that a low-volume and high-mix product line model is a tough business model because it involves a lot of setups and challenges at various levels, including running with high overhead costs, managing materials and labor, risk mitigation, incorporating total quality in every aspect of the business, and manufacturing at competitive prices. P6P6 expressed that because it is a low-quantity, low-mix business, the upfront load (i.e., overhead cost) is high because of the heavy requirement in product design, configuration and testing, product manufacture, customer relations, and quality management. This is why P1P1 and P6P6 thought that EPICOR is the best system for the company because they can see and analyze every aspect of every contract from the purchase order stage to the post-manufacturing stage in one place to support their product cycle structure. To buttress this point, P4P4 emphasized that the importance of their manufacturing system is that jobs can be tracked from the onset to the last operation in EPICOR. P4P4 revealed that production scheduling and other vital timelines throughout the life of every product are controlled using EPICOR. This participant illustrated how the parts are scheduled and made,

> So here we make bellows, among other things. So just to use that as an example, you would need to have multiple jobs because you start with the smallest of those

> pieces that make the final product. So, diaphragms, in our case, are then made and welded into convolutions. Convolutions are welded into bellows. And then sometimes a bellows has a housing. So, all of those could have separate jobs to make each of those components, and then finally, to assemble those together on another job, an assembly job. And all of that is generated out of the EPICOR. Does that make sense?

According to P5P5, EPICOR is third-party software that the management of Company ZYX upgraded with the help of a university in Tennessee to control all their manufacturing operations from the purchase order stage to the postproduction stages. P6P6 said two other companies in the United States make the same kind of aerospace products as Company ZYX, so there is a need to have an outstanding system, such as EPICOR, to be competitive.

P1P1 added that this system is also a communication system because it is used to tell all the levels of employees what is going on and what is needed. This participant expressed that the management uses the system to link the managers to their employees. Bass (1990) and Burns (1978) stated that the leader must be willing to involve the followers in all organizational activities because when followers know what is going on, it is easier to motivate them to help. However, a few participants confirmed that the managers review all the processes and then generate jobs for the employees on the floor. Transformational leaders use two-way communication to make their followers feel

important and appreciated (Burns, 1978). The employees should be aware of their products and their jobs are highly valued.

Production System

The production system or process choice adopted by the manufacturing company is one of the most important factors in the successful management of any manufacturing organization. The choice of the production system is an important aspect of the manufacturing strategy because it is the medium through which the organization produces and fulfills the customer's demand (Dohale et al., 2022). The production system is also important because it links manufacturing to operations. The production system utilized by a company is one of the key tools in determining the organization's finances, among other performances.

Manufacturing leaders determine their production systems based on several factors, including capacity, planning, and inventory (Chen & Wang, 2021: Cooper & Taylor, 2022). Based on the responses of all the participants to Questions 2 and 8, Company ZYX runs a low-volume and high-mix product line and uses multiple manufacturing and production systems depending on the department or process in question. It is difficult to adopt a dedicated manufacturing system. Considering some of the responses to Questions 1 and 8, Company ZYX's production system is an FMS. In response to Question 2, P3P3 expressed,

> There are some cellular types of systems set up in the welding department and our functional test lab. But when it comes to our computer numerical control (CNC)

> department, it's more of a grouped by skill set levels and complexities of product. It is a little bit more of more grouped by skill sets and product complexity instead of just a random cell that can do certain things.

Manufacturing leaders incorporate group technology principles in a CMS. In a CMS, each of the multiple cells consists of a set of machines used to produce a given part family (Cooper & Taylor, 2022). On the other hand, FMS and somewhat RMS are equipped with CNCs to enable the automatic material handling system (Cooper & Taylor, 2022; Lander & Liker, 2007). CNCs' numerical control can easily be changed to target a different task or set of tasks (Chiarini, 2017; Cooper & Taylor, 2022; Lander & Liker, 2007). P6P6's responses to a few follow-up questions to Question 1 and response to Question 8 indicated that the production system on the floor is like FMS. He further stated,

> Our production system is more departmental. And so, when you take a look at a flow diagram of how our materials progress through, there's always an inventory transaction. It may go through a forming operation and machining operation, welding, cleaning, and quality. So, I would say it's more of a linear serial type of production system.

P6P6 also identified the production system as a serial production system. A serial production system is a multistage system in which the production of a product is divided into stages, and the final product is achieved in the last stage (Tayyab et al., 2022). From

P6P6's response above, some stages are forming, machining, welding, cleaning, and quality inspection.

The design of the shop floor structure is consequential to workforce planning and efficiency (Cooper & Taylor, 2022). P6P6, in response to Question 8, identified the production structure as a job shop. This correlates with P6P6's response to Question 2, where he stated that the production floor management runs a serial production system. A job shop is the most complex floor shop structures because it has different processing routes through the workstations (Chiarini, 2017; Cooper & Taylor, 2022). Material flow is designed based on the kind of floor the company's production team runs.

The participants also concluded that EPICOR is their MRP software. Production systems are designed with several factors in consideration, namely floor structure, product manufacture complexity, and material management system. From the above findings, the production floor is a job shop manufacturing system, which an FMS because of the product complexities. The company also runs a serial production system. The material and inventory control system must be selected in such a way that it is of optimal value. P3P3, in one of the Question 8 follow-up responses considering their MRP strategy, classified the system as a push production system. P4P4 also established that the company's material handling is based on the kind of product line and production system in place. The production processes involve long setups due to product line complexities, thereby the adoption of a push system. According to P3P3 and P4P4, the materials manager schedules production ahead in EPICOR based on products' ship dates and other

considerations. Chiarini (2017) posited that in push systems, production is scheduled ahead, requiring an increased inventory and work in progress. In a similar sense, P3P3 elaborated,

> Our equipment is scheduled based on jobs. The jobs are scheduled on equipment within EPICOR using rates and staffing levels. We manage several different types of materials on the floor (raw, components, work in progress, and finished goods). All those materials are managed using EPICOR, warehouse, and bin locations.

TQM

All the participants identified FlexNet as the company's quality management system (QMS). This quality system is used by the entire workforce and throughout the organization as a supplement to EPICOR. This QMS is used for quality-related purposes from when orders are received to post production stages. This QMS is useful because Company ZYX must maintain certain strict quality requirements because Company ZYX is ISO9001 and AS9100 certified. According to P5P5 expressed,

> The second system is a homegrown, developed QMS that we call FlexNet now, and it complements EPICOR. It pulls information from EPICOR but cannot push information into EPICOR. So, we have some things that go on throughout the day or periodically, and FlexNet gets populated by pulling such information. So FlexNet houses our document record index or nonconformity system, corrective action system, program management system, maintenance system, gauge

calibration system, work schedules, and work instructions. All that stuff is located in FlexNet.

The quality system used in this company is a total quality system. Qureshi et al. (2022) posited that TQM is a management system in which the entire employees of the organization must collaborate to produce the best quality products to satisfy their customers' requirements. The upper management of Company ZYZ uses total quality management to achieve coordination among the management leadership team. This quality system is used as a communication system used in communicating to and controlling the employees and their job processes. In total quality management, standards are built and upheld using certain practices and procedures to achieve better performance (Qureshi et al., 2022).

Consequently, P5P5 and P6P6 credited the company's success to the quality system the company's managers utilized. P5P5 and P6P6 agreed that the management maintains the ISO9001 and AS9100 requirements by upholding certain practices and procedures. The leaders and the quality team use FlexNet to enforce quality rules throughout the plant. P5P5 specifically stated that the quality system is not only a company-wide standard but a system the company uses to excel in recertification audits. P1P1 and P2P2 pointed out that Company ZYX, as an aerospace company, has a lot of strict standards that it must comply with, and FlexNet is used to tie all those standards together. P4P4 expressed that this quality system is unique and resourceful. The participant further expressed,

> The one thing I will say is that, in terms of our intranet, the FlexNet, it's one of the best quality management systems I've ever dealt with, and I've dealt with several. Our customers even will come in from the biggest customer names that you've heard of and say how impressive it is because it's a one-stop shop. It keeps all of the quality-related documents together. You know, we're AS9100 certified and not just ISO. So, all that documentation, all the requirements, the flow-downs, the customer, everything is all in that system.

In expressing how the management has achieved outstanding performance using this quality system, P6P6 stated,

> So, as a company that is AS9100 and ISO9001 certified, there's a certain framework that you must have to be compliant with the requirements of AS9100 and ISO9001. AS9100 covers areas such as quality management systems, control of nonconforming product design, inputs, outputs, and inventory, and FlexNet covers every one of the above areas. Being a part of that accreditation and having that certification means that there's at least a baseline of your capability with regard to these standards. So, Company ZYX has a quality management document or quality manual that states how we do it to comply with the standards. The quality system details how you do business and how you can make your business meet those requirements. We use our EPICOR and FlexNet systems to comply with all these standards.

P6P6 pointed out that EPICOR is used to control all premanufacturing, manufacturing, and post-manufacturing activities such as bill of materials, routers, clock-ins and clock-outs, inventory, and operational sequence. P2P2 and P6P6 pointed out that their QMS, FlexNet, is more of an information system that is used for housework instructions, manuals, contract reviews, specifications, and the like. Referring to FlexNet, the QMS, P2P2 said, “It is our key tool to make sure when we're setting things through a review and approval cycle, that all of the relevant departments, namely, programs, engineering, manufacturing, quality, materials, sales, and maintenance have read and approved it.”

Successful Strategies

All the participants expressed confidence in their strategies. There are 138 references from 10 sources altogether between the interview data and company document that mentioned or reflected on the strategies used by Company ZYX, as shown in Table 2. Questions 2 and 3 of the interview are specifically focused on the strategies used to implement efficient manufacturing systems. Table 3 is a compilation of the responses of the six participants about Questions 2 and 3.

Participants one through four indicated that using metrics to manage key performance indicators (KPI) is one of the top strategies they use to implement their company’s efficient manufacturing systems. P5P5 and P6P6 identified, among other strategies, training processes as an outstanding strategy to implement efficient manufacturing systems. Except for P4P4 and P5P5, the rest of the participants rated

communication among the three outstanding strategies to bolster improved performance. Considering Table 3 and the rest of the 138 references, Company ZYX's strategies are evidenced by the manufacturing, management, production, quality, and material handling systems used by the leaders and employees to improve their company's performance.

Table 3

Top Points From Participants' Answers to Questions 2 and 3

Participants	Top three points from answers		
	Point 1	Point 2	Point 3
P1P1	Measuring metrics	Understanding metrics' impacts on business, results, and goals	Communication and setting priorities
P2P2	Transparency in quality system and communication	Structured approach of cross functional review	Metrics to measure effectiveness
P3P3	Efficient materials handling and production systems	Efficient management of people and process with communication	Tracking activities with metrics
P4P4	Metrics to drive and track improvements	Automation of results incorporated in EPICOR	Efficient materials and production management
P5P5	On-the-job training and coaching program	Establishing poka-yoke throughout the plant	Efficient quality system
P6P6	Process control and communication in training and processes	Serial production and an indented bill of materials	Product life cycle design and control method

The QMS in place in this company is noteworthy. The quality system is very detailed and used to control every aspect of the business. All the participants recognized that their main system is the modified ERP and the MRP software, EPICOR. The homegrown quality system, FlexNet is another powerful tool used by the managers to improve the company's performance. Communication and training are among the top three outstanding strategies identified by the participants. Effective communication is a core part of good leadership. Transformational leaders communicate effectively to increase trust and loyalty among their followers. Directly or indirectly, all six participants recognized that FlexNet is their information system that is used to derive information from EPICOR. With respect to FlexNet, P5P5 expressed,

> Well, it's really a requirement because we're AS9100 certified here. AS9100 forces down certain requirements like calibration and non-conformity tracking. And that's really what the foundation was that FlexNet got built on. It was how we complied with AS9100. And then, we started building the system to fill in the gaps that we had with EPICOR. EPICOR is a great system, and it does have certain things like non conformity tracking and stuff. It didn't go into the level of detail that we needed to be able to comply with AS9100.

Owing to the nature of Company ZYX's business design, implementing a total quality system to comply with AS9100 and ISO9001 is an outstanding strategy. P5P5 expressed that the customers and auditors are impressed with this system. The type of quality system in place in Company ZYX has been one of the strategies that is used to

improve the company's performance over the years. Manufacturing organizations use sets of strategic and coherent decisions or structures that are relevant to successfully manage their manufacturing business and to improve their companies' performance (Olhager & Feldmann, 2018).

Company ZYX has a well-structured leadership team. The leadership team is set up in a way that each leader has access to what is going on in the company at the same time through EPICOR and FlexNet. The business setup is very thorough. The team makes use of tools like metrics and the like to consistently carry out their business to satisfy the customers' demands. P1P1 said that the strategy is effective and has brought the business to the limelight. This company is set up strategically.

The managers use some of the controls in place, such as EPICOR, FlexNet, quality setup, engineering, and the like, to make Company ZYX stand out in the industry. According to all the participants, the customers are impressed by the business and manufacturing strategies in place, and for that reason, it is easy for customers to buy in. The leaders use EPICOR and FlexNet to centrally control the manufacturing, production, and business operations at a glance. Everything is in one place and easily accessible. Three of the participants explained that one of the world's largest aerospace and science companies, identified as Company ZBC in this study, came to sign a deal to allow company ZBC to adopt Company ZYX's manufacturing system. P2P2 noted,

> Yes, that really makes the strategy very practical and very executable. It really is. In fact, ZBC came, one of our customers, you know, to review because they were

> going to order a product. They came in and said, it is great; we approve. But then they brought in their own people a couple of months later to try to emulate what we had to instill at ZBC. So, we are very proud of that, that they thought it was that good. So, we are very proud of it. And honestly, when we bring in customers, potential customers, when we bring them into the conference room, and we show them all our systems, and how everything is just right here, it really helped close the deal because they feel like we are going to meet all the quality requirements and it's all in front of them. So, it gives them a good security feeling.

Company ZYX's strategies include powerful tools that the leadership team uses to control, guide, and integrate all their procedures and manufacturing activities, such as quality management, material handling, production planning, product and process designs, customer satisfaction, and employee management. Alcaide-Muñoz et al. (2018) expressed strategic planning in terms of tools for the control, coordination, guiding, and integration of various organizational procedures and activities. This company's manufacturing strategies are in line with multiple researchers' views on manufacturing strategies. Practitioners and researchers agree that manufacturing strategy is a complex aspect of the business because it incorporates the strategic management of multiple aspects, including satisfaction of the customers' requirements, the management of manufacturing materials, skill capacity building, improving competitiveness, balancing of uneven resources such as machinery and man, and bolstering of the organizational internal and external competitive advantages (Dohale et al., 2022; Hoang et al. 2020).

Operations Management

Operations managers' primary function is to improve the company's performance (Arumugam, 2022). Christ et al. (2022) posited that managers must link their planning to other business functions to achieve success. Company ZYX's operations management system is developed to cut across every business function. The company's operations develop, strategize, and manage processes and systems to achieve operational excellence. P1P1 expressed that one of the most powerful operations tools available in Company ZYX is the frequent face-to-face meeting of all the leadership team members, known as the executive leadership team. ELT comprises managers from different company functions, including plant manager (president), director of engineering, materials manager, director of manufacturing, quality manager, and director of sales and programs management. Managers of various company functions come together to discuss business and share their progress. Challenges are itemized and prioritized in these meetings.

P1P1 confirmed that each manager is tasked with executing a list of things. During the face-to-face meeting, each manager is asked to present progress and huddles. This meeting is called the weekly huddle. In this meeting, challenges, new businesses, manufacturing, priorities, past week's performance, current week's issues, past due shipments, and other issues are discussed. This meeting was established to encourage the managers to achieve their tasks because when each manager knows that the manager is expected to present progress in the meeting, the manager prepares well to avoid embarrassment, according to P1P1. The importance of the meeting is to treat top

priorities first, and the entire management team understands clearly, what is required from them, what has been achieved, and what needs to be achieved.

Some of the core of every operations management team should include developing strong processes, developing plans for continuity, engaging every function of the company, developing plans for mitigating risks and losses, and improving the company's external and internal performances. When Company ZYX gains a new business, all the functions, including the process development team, design engineers, programs managers, quality managers, manufacturing managers, and the like, come together during a kick-off meeting to work on the manufacture of the said product to understand what could go wrong and develop plans to mitigate risks. During the meeting, risks are evaluated, and strategies for efficient manufacturing of products are developed. Material and other vital issues are also discussed.

P1P1 and P2P2 established that one of the most important values of EPICOR is the centralization of information. Every function is aware of what is going on at a given time. Communication is one of the most important tools the participants identified. From the analysis of the interview data and company documents, communication was mentioned or referred to 66 times. P1P1 explained that there is always communication going on at various levels. P5P5 indicated that communication is done through the quality system. P5P5 said, "Everyone knows what is going on and what they are supposed to do." Communication is a vital factor in an organization. Employees, leaders, and customers build a good rapport with the company when managers always engage and

update the employees and customers. Transformational leaders engage their followers with all aspects of the businesses so that their followers understand what and why their times and commitments are crucial.

Challenges

Questions 6 and 7 and a few company documents focus on the challenges the managers encountered using their manufacturing systems and how they dealt with them. Challenges were referenced 48 times. Table 4 is a compilation of the most mentioned challenges during the interview. The effects of these challenges on the company and their root causes are tabulated in Table 4. Data used for this tabulation are information from the interview and available company documents. Many researchers agreed that manufacturing is associated with many challenges, and it is the managers' job to identify and mitigate them (Manikas et al., 2020). Operations managers must be ready to strategically plan well to overcome these challenges by improving their internal and external competitive advantages (Christ et al., 2022; Manikas et al., 2020). The managers must identify, develop plans, and execute the plans to mitigate the effects of these challenges on the company's performance (Manikas et al., 2020).

All six participants see the job scheduling in EPICOR as a key factor for the efficient manufacturing of profitable products; however, five out of the six participants recognized that EPICOR router job sequencing is challenging due to several variables, including machine, people, and material availability, and customer requirements. P3P3 and P4P4 identified that EPICOR router jobs are stacked according to ship dates. They

concluded that sometimes, due to labor, machine, or other issues, the lead times of these jobs are not achieved. The production personnel cannot change the sequence, even when they can't meet the top job, due to the manufacturing system's requirements, process and product complexities, and material-related issues, owing to EPICOR setup. The effect of this challenge can be felt in product delivery, customer satisfaction, company performance, employee frustration, and the like.

Material availability is one of the most frequent challenges. Several participants recognized material availability as a challenge. If materials are unavailable, production of products won't continue. Supply chain-related issues are one of the main root causes of this challenge. Customer requirements such as takt time, material type, and order quantity are other root causes of this challenge. P3P3 expressed that purchasing material can be difficult at times because this is a low-volume production plant, and placing high-volume orders with suppliers is more cost effective. In some cases, the volume is too low to place high-volume orders. Suppliers will give priority treatment to customers with high-volume orders, according to P3P3. Suppliers might not be reliable sometimes. If the materials are not supplied as scheduled, production is affected. Consequently, scheduling, customer satisfaction, and company performance can be affected.

Another major challenge was maintaining adequate head counts. P1P1 and P3P3 specified that hiring and retaining the adequate number of employees needed for the smooth running of the business has been a challenge. P4P4 and P5P5 expressed difficulty in training the workforce due to the challenges associated with training requirements

assigned to each worker. The system's configuration is favorable for technologically or computer savvy employees and frustrating to those not in this category, especially when the employees are new to the company, according to P4P4. P4P4 and P5P5 stated that many employees who deemed the system too difficult tended to quit. Several reasons the headcount is affected include the global labor market crisis, increased turnover rate, skill requirements, and the like.

Most of the participants expressed that EPICOR and FlexNet are powerful systems. However, they also said that the systems have some complexities. One of the challenges associated with the system is the cost of maintaining it. P5P5 expressed that the systems are very dependable but require heavy maintenance. This participant also explained that upgrading and updating the system requires expertise, time, and money. A few participants expressed that the system is a bit intimidating to employees, especially the new ones, due to the technological involvement. It is expensive to maintain the system.

The overhead cost was identified as a big challenge by two of the participants. The organogram, headcount, and other metrics are indications that the company carries a high cost in overhead. Some root causes of the heavy overhead or front load are the product line model (low-volume and high-mix products), managerial structure, product complexities, and the like. A high overhead cost can drastically affect the profit margin and the company's performance. The design and production of the products are expensive not only because products are complex to make but also because there are a lot

of quality and other regulatory requirements associated with the government and aerospace industry. Furthermore, P6P6 explained,

> And let us just pick Airbus A350. It is a large commercial aircraft. We have an accumulator that is big in diameter and length that is on the braking system. We make two of those per plane. This system will tell me what cert I did when I shipped it. What the part number was, how many, and what the serial numbers were. So, if I get a customer return, I can literally come in here and find the serial number. Here is one where I shipped one part. This is serial number 2335. This is the acceptance data package for that part to ship one piece. It is 300 pages long.

The above illustration is an example of the reason for the heavy overhead and manufacturing costs. There are heavy costs associated with the quote, design, process, production, and shipment of the products. Engineering, for example, has over five members for a small company like Company ZYX. The organizational structure in Figure 1 is a demonstration of the management structure. Considering multiple participants' responses and Figure 1, there are a lot of managers who make up a major part of the overhead. Overhead costs are significant portions of the production cost. The total number of employees that work in the company is 110. Normally, strategies and processes should be designed to decrease input to improve the company's performance (Kuhnle et al., 2022).

Table 4

Most Referenced Challenges, Effects, and Root Causes

Challenges	Effects	Root causes
Manufacturing system's (EPICOR) router job sequencing	Poor on-time delivery, unsatisfied customers, and poor company performance	EPICOR setup, process design, scheduling, labor, machine, and materials issues
Materials availability	Poor on-time delivery, unsatisfied customers, and poor performance	Supply chain problems, job prioritization, customer demands, and takt times
Maintaining adequate headcounts and labor	Poor on-time delivery, unsatisfied customers, and poor company performance	The labor market, labor costs, skill capacity issues, employee satisfaction, and production planning issues
Keeping up with overwhelming training requirements	Increased turnover, employee frustration, skill capacity issues, and work overload for management	Quality requirements, job requirements, skill capacity building, and company ISO9001 and AS9100 requirements
Maintaining milestones	Poor company performance	Business model, skill level, and customer requirements
Maintaining a healthy manufacturing cost	Low profit margin, poor company performance, and possible loss of business	Material, labor, equipment, and material planning, product and process design, production system, and high overhead.
Carrying high overhead cost	Low profit margin, high upfront cost, high production costs, and loss of business	Business model (low volume, high mix), many managers, product type, and leadership structure.
Maintaining high tech systems (EPICOR and FlexNet)	High maintenance cost, high turnover rate, high skill requirement, increased labor cost, high cost of training	Company certification requirements, competition, and complicated customer requirements
Production of expensive low-volume and high-mix products	High cost of design, process, and production, and high upfront cost.	Customer satisfaction and retention, market competition, and business strategy

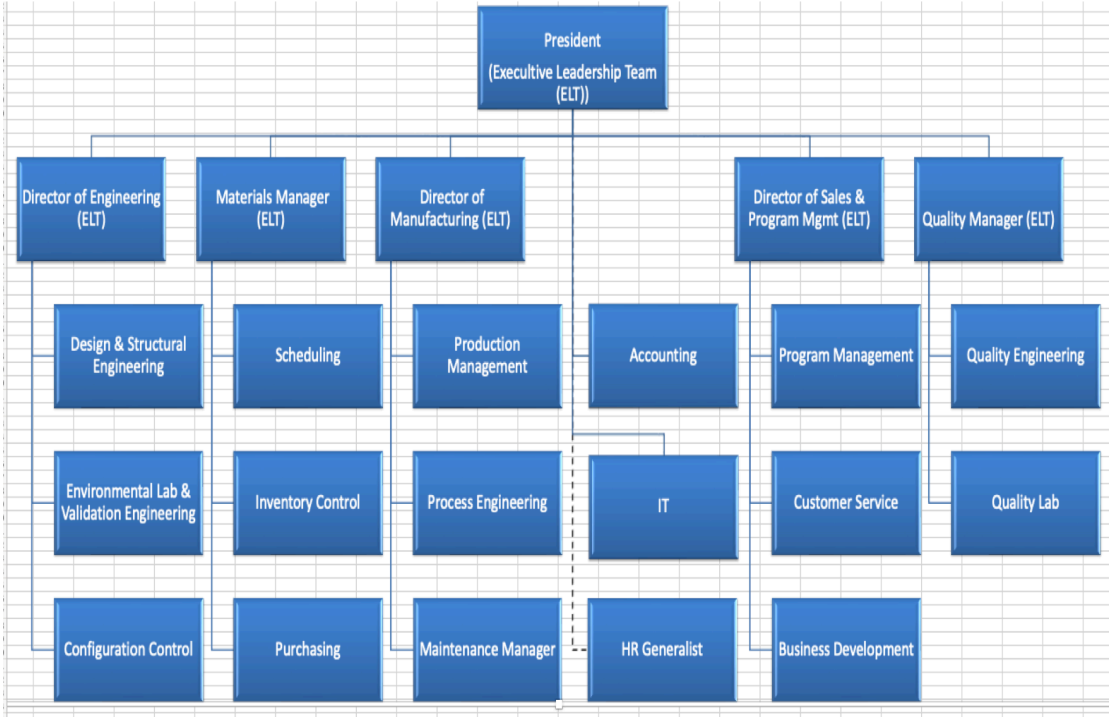
Table 5

Operations Management References

Themes	Number of files	Number of references
Operations management	16	124
Challenges	7	48
Performance measurement	8	66
KPI	7	27
Metrics	7	34

Figure 1

Company ZYX's Organizational Breakdown Structure



Operational Excellence

Question 4 focused on how managers measure the effectiveness of their manufacturing systems. Performance measurement was referenced 66 times, as shown in Table 5. Metrics and KPI were referenced 34 and 27 times, respectively, as shown in Table 5. These statistics are an indication that the management team makes decisions using metrics and KPIs. All six participants identified metrics as performance measurement strategies Company ZYX's managers used. Each of the managers has metrics to measure assigned KPIs. Annual sales results, earnings before interest, taxes, depreciation, and amortization (EBITDA), contribution margins, on-time delivery at various levels, overtime hours, headcount, labor, materials, and scrap as percentages of sales, customer satisfaction, and the like are some of the KPIs the managers measure. There are several company documents with charts and tables to indicate the results of these measurements. P1P1 expressed how seriously the managers track some of the key indicators and how they have used the results of these performance measurements to improve the company's performance.

Operations managers use metrics to measure their performance and identify areas needing adjustment. Normally, the managers intend to reduce input without much focus on the output to decrease the manufacturing cost and improve the company's performance (Manikas et al., 2020). P3P3 emphasized,

> We have a certain scrap rate that we try to stay below because we are low volume, high mix. It's typically more than what you would see in a standard, high-volume,

> low-mix manufacturing facility. And we monitor that regularly. Also, we track our on-time delivery because our effectiveness is not just the quality of the product or the cost of the product, but it's also how the products arrive at our customers in the time that they expected it.

Operational excellence is used to measure the operating performance of the company. Operations managers and their directors set up performance metrics to measure their performances at various levels and functions for efficient management of processes and operations (Golcher-Barguil et al., 2019). Company ZYX's operations team measures the company's performance using various metrics. Kuhnle et al. (2022) and Szabo (2018) posited that performance measurements are focused on the systematic reduction of inputs without much focus on the output because when inputs are under control, costs associated with those inputs are reduced.

Table 5 is a tabulation of the references related to operations management. Specifically, in Table 5, performance measurement, KPI, and metrics are all aspects of operational excellence. Operations management is the theme with the highest number of references when all the components are added together, as shown in Table 5. The participants excitedly expressed throughout the interview that they track key performance indicators at various levels. For instance, P2P2 stated,

> We are a very metric driven or key performance indicator driven company. To give you an idea, I think there are over 40 metrics that we track monthly. We

review them within the management team to make sure we're hitting our targets in all departments.

A few performance indicators are assigned to managers of various functions to measure and report, according to several participants. Each manager is tasked with presenting his or her results during the management meetings. The management team measures these performances majorly using EPICOR, FlexNet, and Excel spreadsheets, according to P1P1 and P6P6. There is also an annual internal management review audit of each manager to ascertain that they are up to date in their managerial functions, including these measurements and performances. The quality department is responsible for the internal audits of the managers. The operations setup and functions of Company ZYX align with published articles. For example, Manikas et al. (2020) emphasized that manufacturing strategies must be aligned with all the company's other functions for outstanding company performance. The Company ZYX director of engineering measures the on-time delivery of the engineering and configuration team’s functions, including CAD modeling and design of the products, finite element analysis, validation of designs, and incorporating the drawings and all the data into EPICOR. The engineering on-time delivery is in Figure 2. According to P6P6, engineering functions can affect the overall performance of the entire company. A similar chart is shown in Figure 3 for Company ZYX 2022 on-time delivery to customers. The participants all agreed that each function's activities affect the company's overall performance.

Figure 2

Company ZYX 2022 Engineering Milestones On-Time Delivery

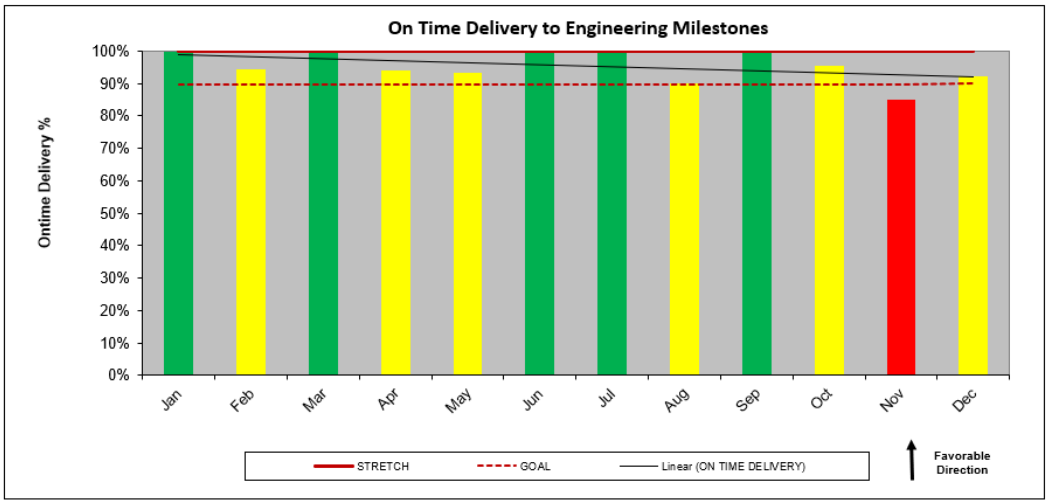
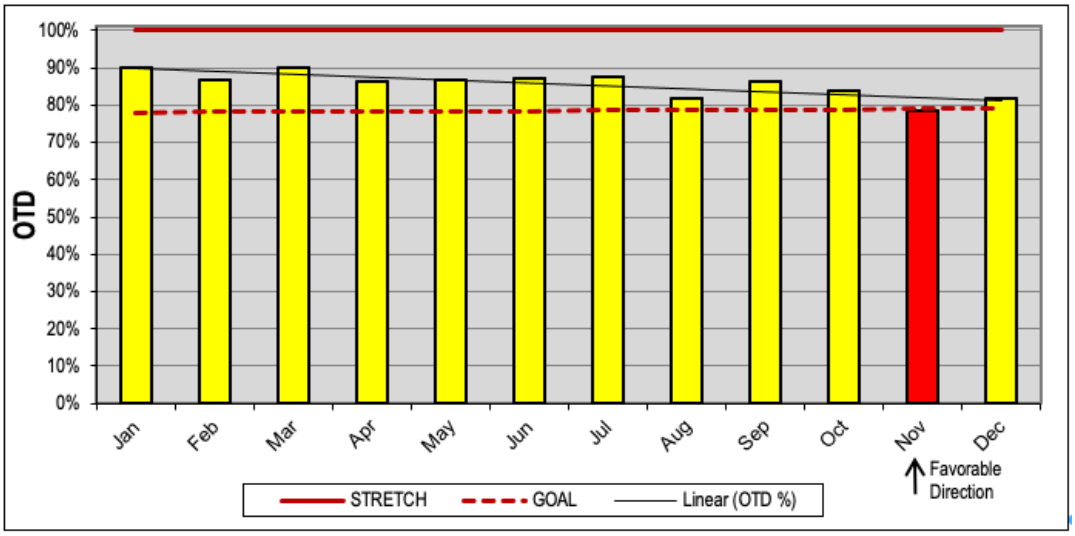


Figure 3

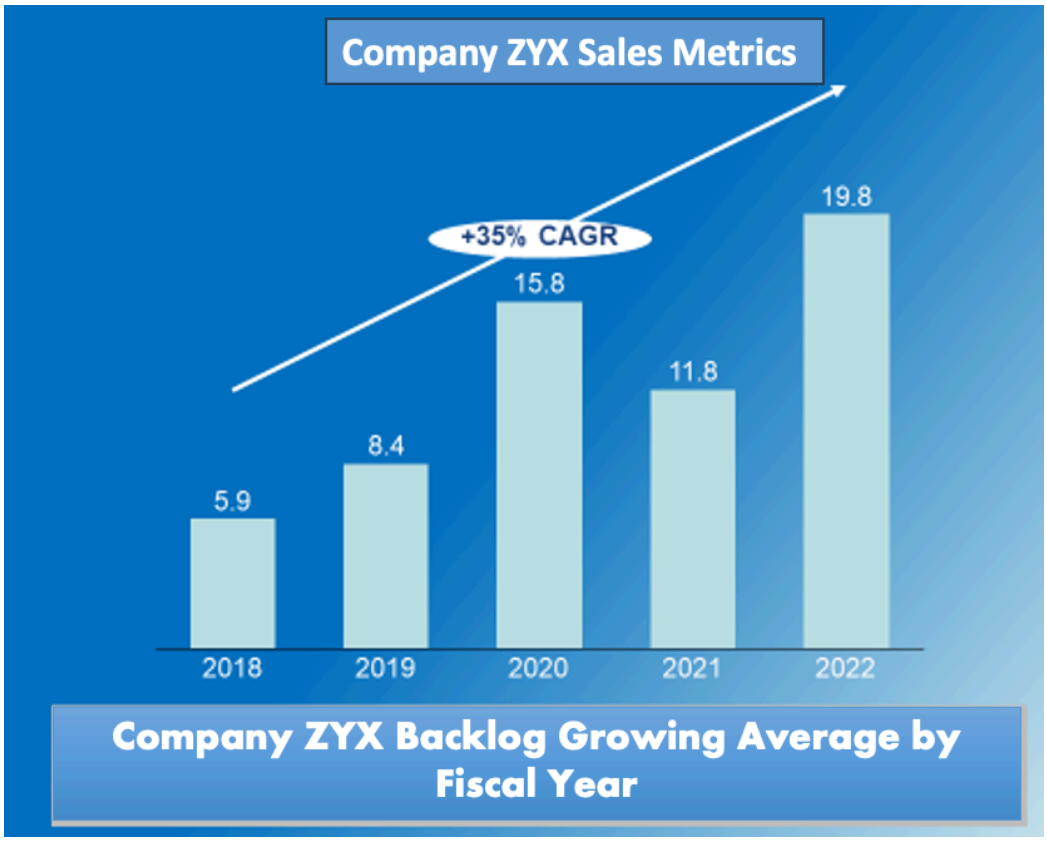
Company ZYX 2022 On-Time Delivery to Customers



Furthermore, the operations managers must develop strategies to measure their performances to maintain and improve their company's performance (Eker & Eker, 2019). The results of these measurements should be used to improve performances that do not line up with the company's plans. For example, P1P1 established that the manufacturing leadership measures and maintains the direct labor and manufacturing indirect labor. P3P3 stated that production management measures and controls overtime hours. The managers measure the headcount and compare it with the number of overtime hours worked and the past-due hours that still need to be completed. The management team decides to add or reduce headcounts based on sales results, labor hours, overtime premiums, past due hours, and forecasted hours metrics. In Figure 4, the compound annual growth rate is based on the backlog growing rate. According to P1P1, the backlog means the dollar value (in millions) of received purchase orders that can be shipped then. The compound annual growth rate is 35 %.

Figure 4

Company ZYX's Compound Annual Growth Rate

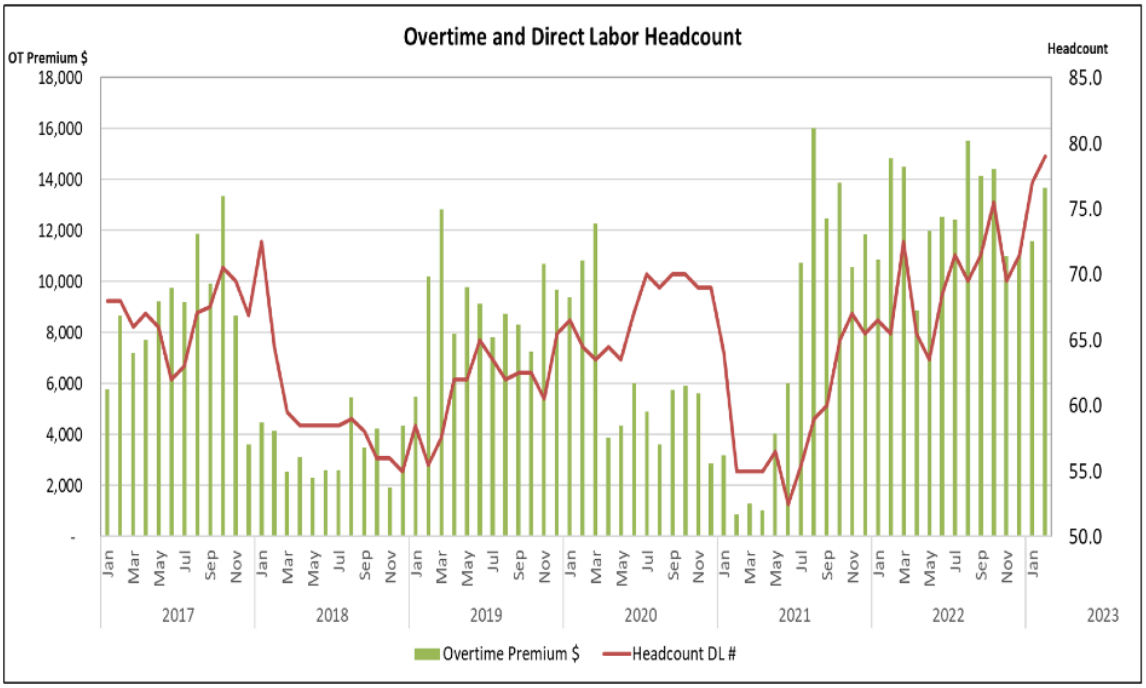


The programs and sales department measures backlog and sales to customers each fiscal year, and the management uses these measurements to make vital decisions such as increasing headcounts and capital investments. The quality systems significantly affect the company's overall performance because of the amount of training allocated to each employee. The training period for a new employee range between three months and five years, depending on position, according to P1P1 and P5P5. During this training period, most employees' efficiencies and productivities are poor. Consequently, the headcount overtime hours increase even though efficiency might not increase. The scrap rate may

also increase during the training period because the new employees are not efficient yet. All these KPIs are measured to understand the interrelationships of the company's different activities. The relationship between direct labor headcount and overtime premium is shown in Figure 5. There was no significant reduction in overtime premiums when more employees were added. An increase in overtime premiums without a significant increase in sales can cause the company to lose money. The manufacturing management measures the overtime and direct labor headcount, as shown in Figure 5.

Figure 5

Company ZYX Overtime and Direct Labor Headcount Tracking



P3P3 expressed that they look through various operations involved in making the product to identify the operations or processes that are not efficient. They adjust inputs such as labor, headcounts, processing times, overtime hours, and the like to increase

performance. This aligns with other published articles in that manufacturing managers are tasked with reducing production and process times (inputs) to reduce manufacturing costs. Afrifa (2016) argued that when managers improve their manufacturing processes, their manufacturing costs decrease. Managers should invest in activities that are pivotal to efficiency improvements. P3P3 stated,

> It comes down to people and process. To gain efficiencies, we look at our setup and our cycle times. It would just be to optimize the amount of time, that is, the speed of the rotation of the part. Or in the forming department, it might be the setup time as well. And so I think for efficiencies, we look at our people, our training, our processes, and tooling.

Figure 6

Company ZYX Earned Production Hours Versus Demand Hours

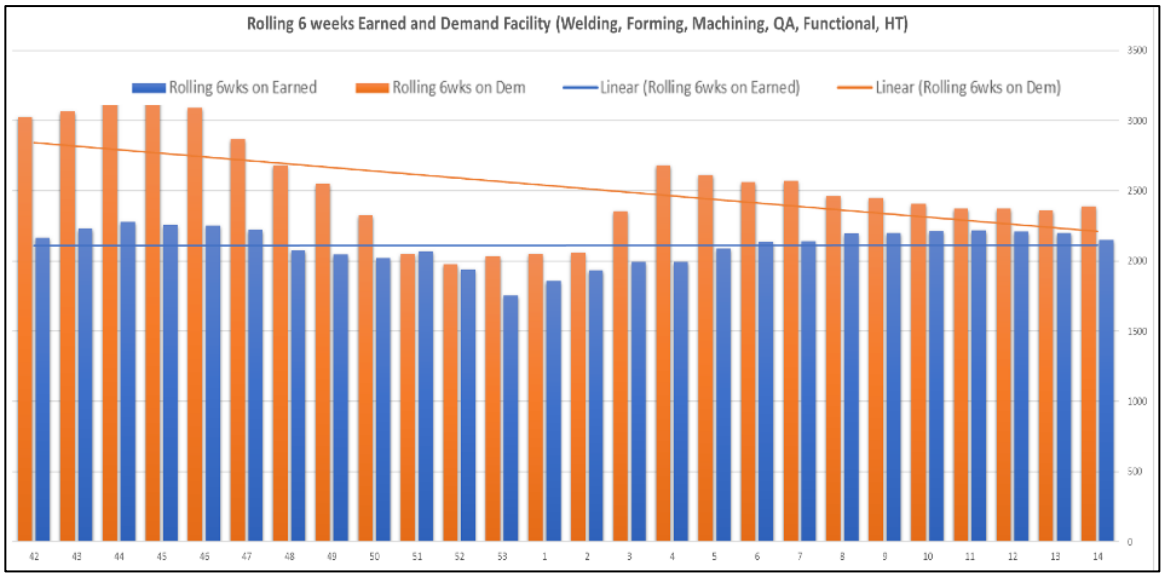


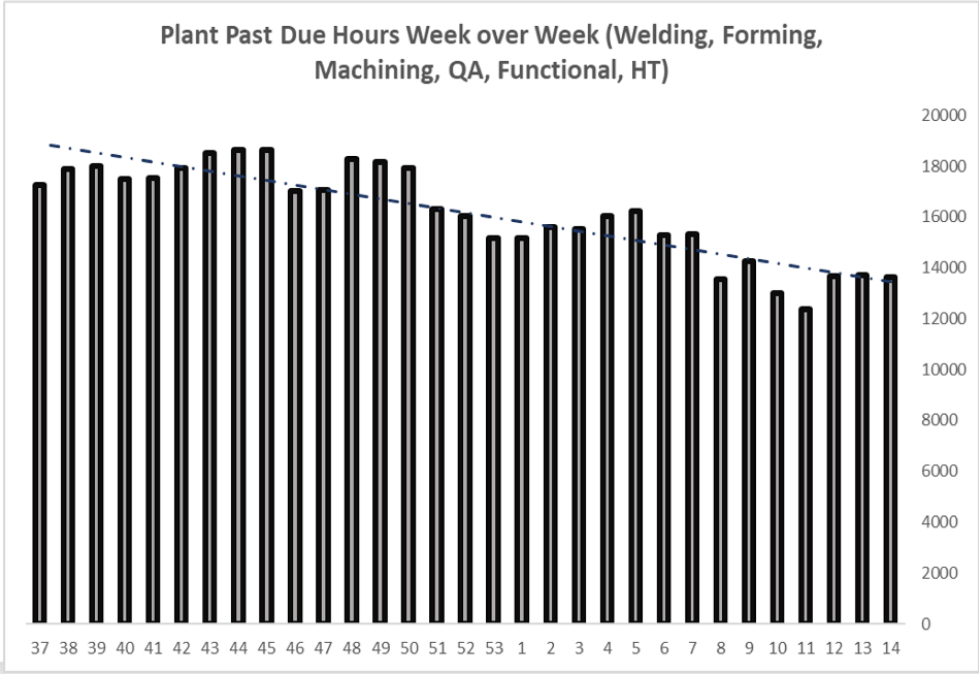
Figure 6 is a metric used in measuring the earned (actual) production hours and the demand hours (hours based on customer demands). The chart reflects hours from week 42 (October 17 through October 23) of 2022 to the beginning of week 14 (April 3) of 2023. The earned hours included regular and overtime hours from the headcounts. The management uses this metric to understand what areas to adjust to increase throughput and customer satisfaction. With respect to the chart in Figure 6, P1P1 said,

> With our order book twice the number from a few years ago, we have focused on "earned hours" as our metric for increasing throughput in the plant in order to meet demand. The blue bar represents earned production hours from an increasing headcount and overtime. We have been able to chip away at the demand hours facing us. The orange and blue trend lines intersecting demonstrate we are beginning to achieve our goal.

The result of Figure 6 reflects the past due hours. The past due hours are hours needed to meet customer demands that Company ZYX was unable to meet due to a shortage in headcounts and other related reasons. Figure 7 shows that when the managers started focusing on controlling the earned hours and meeting the demand hours, the past due hours decreased, as shown in Figure 7. In this regard, P1P1 said, "Past due production demand hours continue to decrease as we add headcount and overtime, which increases throughput or earned hours. Week 37 refers to September 2022, and Week 14 is April 3, 2023."

Figure 7

Company ZYX Various Manufacturing Operations Plant Past Due Hours



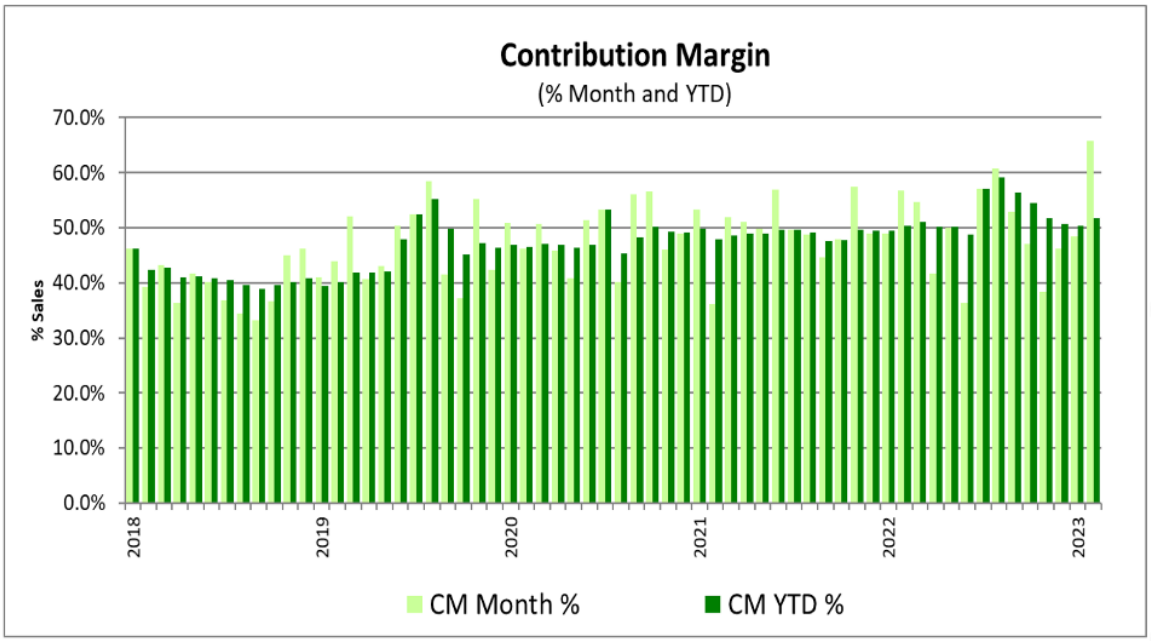
To demonstrate the effect of these measurements and adjustments, the management measures the effects of material, direct labor, subcontract, and variable overhead costs on the company's profit. The managers measure the above costs against sales to customers to understand their contribution margin. Several participants expressed that they intend to increase the contribution margin by increasing sales and controlling manufacturing variable costs. The chart in Figure 8 results from the efforts of the entire workforce geared towards continuous improvements of their processes, product mix, management structure, and other cost reduction projects. Regarding Figure 8, P1P1 said,

> The contribution margin is sales less material, direct labor, subcontract costs, and variable overhead. We strive to continuously improve existing program margins

through yearly cost-reduction projects. Across 5 years, we have enhanced our overall margin mix, after direct costs, by 10% of the sales price.

Figure 8

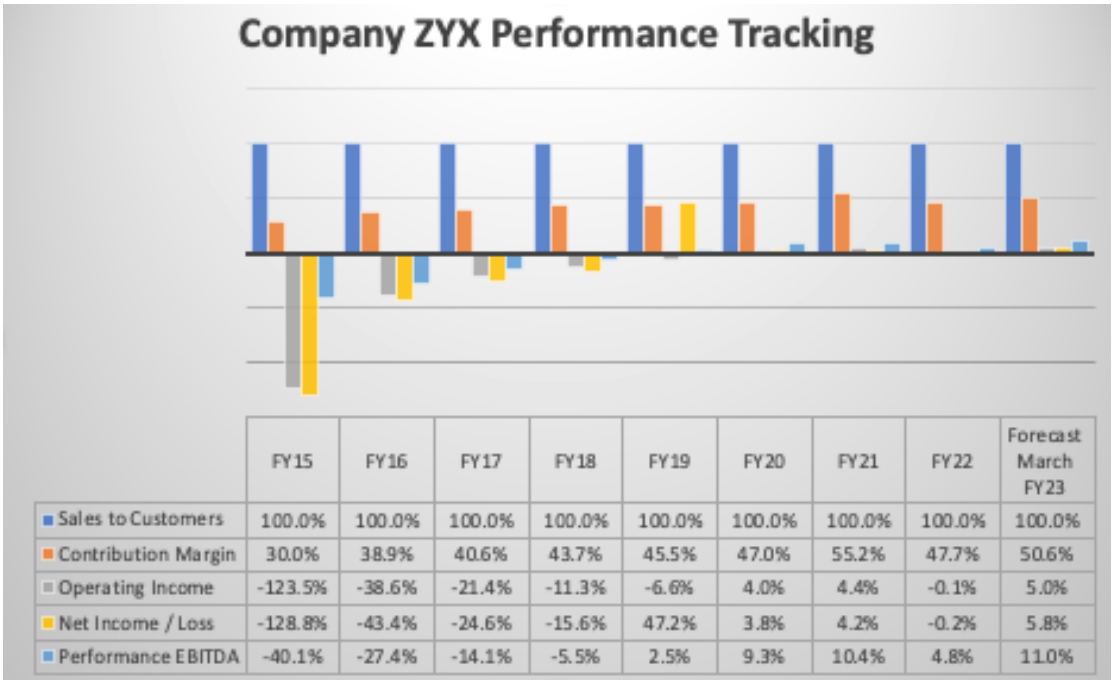
Company ZYX Contribution Margin from 2018 to 2023



The managers measure their performances, such as contribution margin, operating income, net income, and EBITDA, every year to understand the impact of their activities on their bottom line. Figure 9 is a compilation of these performances as percentages of sales. Higher percentages translate to higher profit margins. Even though the contribution margins increased significantly from the 2019 fiscal year, the other performances are not linearly performing in the same trend. This could mean that the other business functions are affecting these performance measurements as well.

Figure 9

Company ZYX Performance Measurements by Fiscal Year



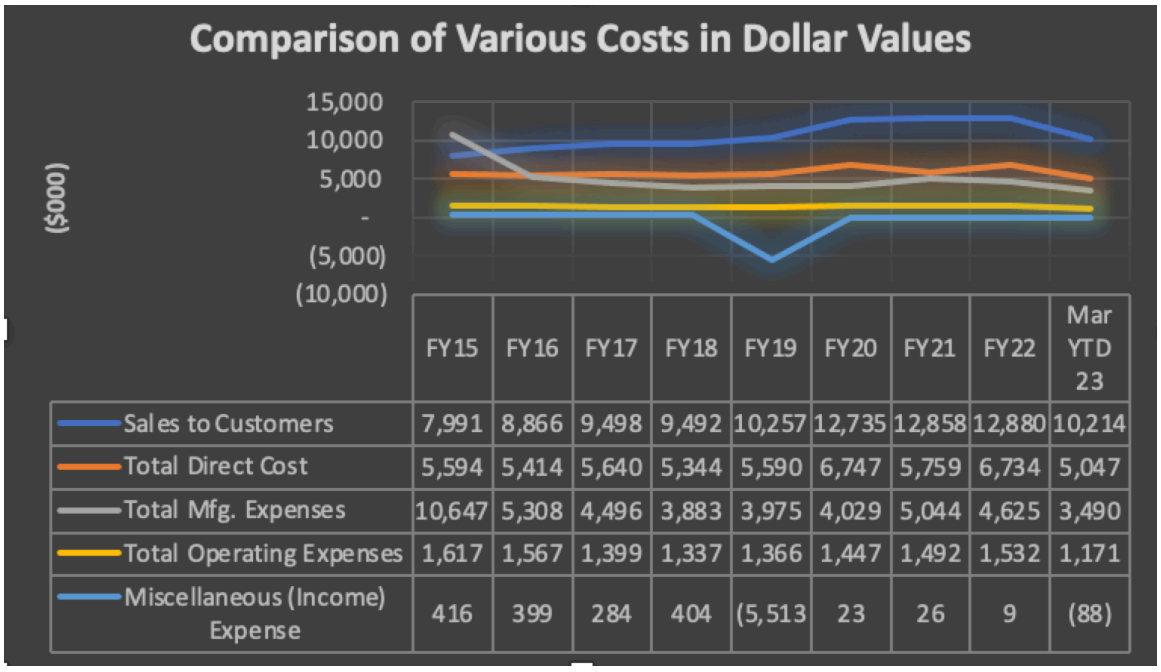
	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	Forecast March FY23
Sales to Customers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Contribution Margin	30.0%	38.9%	40.6%	43.7%	45.5%	47.0%	55.2%	47.7%	50.6%
Operating Income	-123.5%	-38.6%	-21.4%	-11.3%	-6.6%	4.0%	4.4%	-0.1%	5.0%
Net Income / Loss	-128.8%	-43.4%	-24.6%	-15.6%	47.2%	3.8%	4.2%	-0.2%	5.8%
Performance EBITDA	-40.1%	-27.4%	-14.1%	-5.5%	2.5%	9.3%	10.4%	4.8%	11.0%

A few participants expressed that Company ZYX has lost money over the years because of the company's product mix and other associated issues. Table 4 is a compilation of the most occurred challenges the participants identified. One of the challenges that affect the company's performance is product mix. Another key challenge is leadership structure. Some participants stated that because of the product mix and leadership structure, the manufacturing and production costs of the products are expensive. Even though the management has focused a lot of time and resources on the control of the manufacturing costs, the other costs are still affecting the business performance, as shown in Figures 10 and 11. Direct cost, made up of materials and subcontracts, direct labor, and freight-in, seems to be the highest cost. Total

manufacturing expenses, made up of indirect wages, tax and benefits, shop expenses, and manufacturing related depreciation and amortization, are the second largest cost. Total operating expenses, including office salaries, tax and benefits, office expenses, depreciation and amortization, G and A-Corp allocations, and commissions, are constant across the fiscal years.

Figure 10

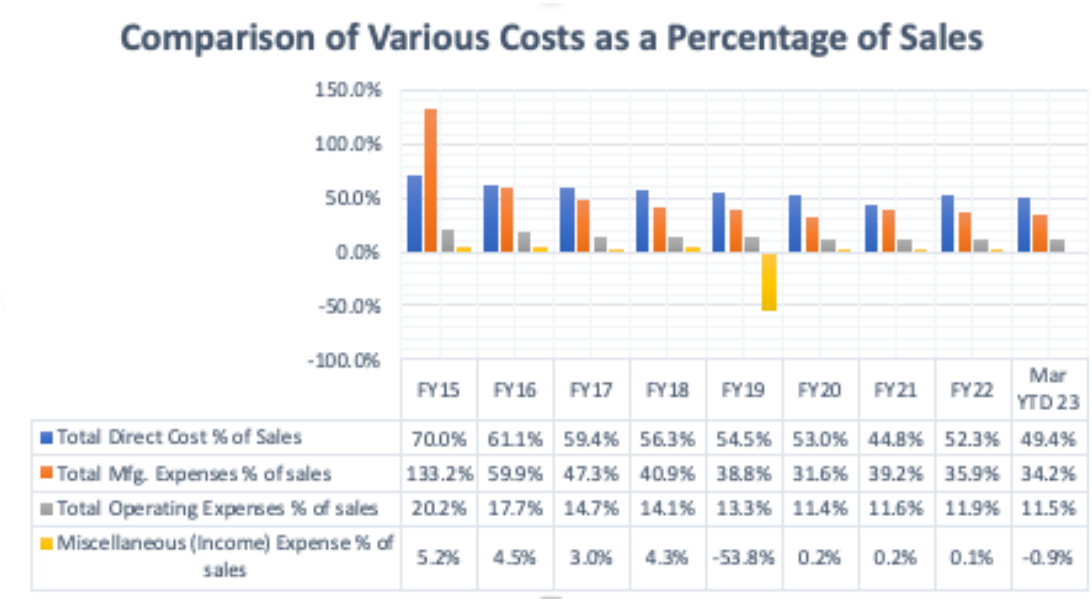
Company ZYX Comparison of Various Costs by Fiscal Year



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	Mar YTD 23
Sales to Customers	7,991	8,866	9,498	9,492	10,257	12,735	12,858	12,880	10,214
Total Direct Cost	5,594	5,414	5,640	5,344	5,590	6,747	5,759	6,734	5,047
Total Mfg. Expenses	10,647	5,308	4,496	3,883	3,975	4,029	5,044	4,625	3,490
Total Operating Expenses	1,617	1,567	1,399	1,337	1,366	1,447	1,492	1,532	1,171
Miscellaneous (Income) Expense	416	399	284	404	(5,513	23	26	9	(88)

Figure 11

Company ZYX Comparison of Various Costs as Percentages of Sales

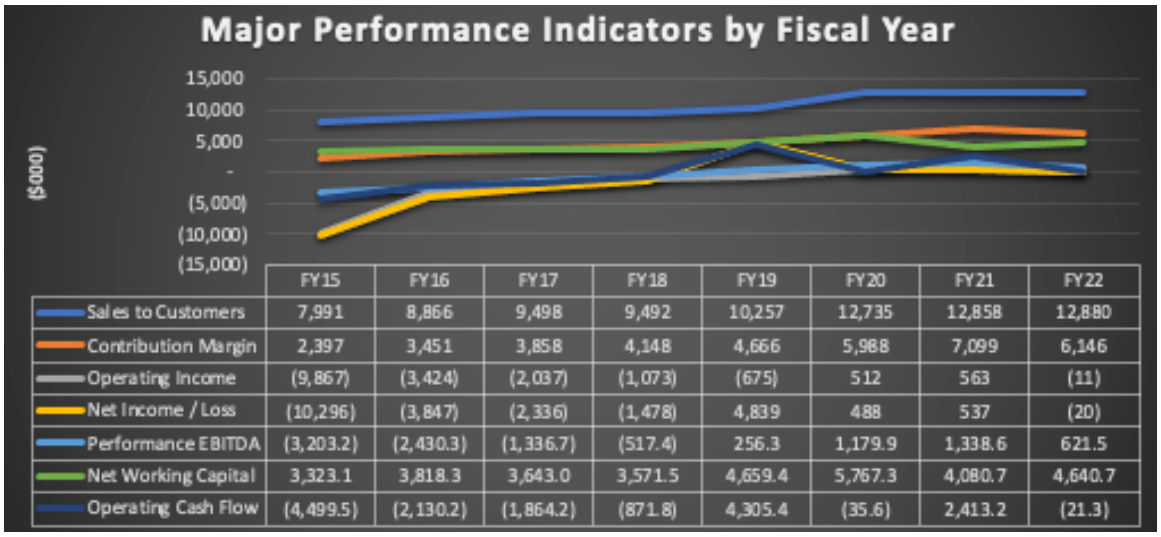


	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	Mar YTD 23
Total Direct Cost % of Sales	70.0%	61.1%	59.4%	56.3%	54.5%	53.0%	44.8%	52.3%	49.4%
Total Mfg. Expenses % of sales	133.2%	59.9%	47.3%	40.9%	38.8%	31.6%	39.2%	35.9%	34.2%
Total Operating Expenses % of sales	20.2%	17.7%	14.7%	14.1%	13.3%	11.4%	11.6%	11.9%	11.5%
Miscellaneous (Income) Expense % of sales	5.2%	4.5%	3.0%	4.3%	-53.8%	0.2%	0.2%	0.1%	-0.9%

Most of the metrics and documents provided centered on manufacturing cost control and not much information on other business areas. Researchers emphasized that managers must strategically choose the most beneficial performance measures to select instead of spending resources on performance measures that may not be significant to the company's performance (Hashemi-Petroodi et al., 2021; Nicholds et al., 2018). Direct cost and total manufacturing expenses as a percentage of sales have decreased reasonably since 2019, and these, in turn, positively affected the EBIDTA and other key performances, as shown in Figures 10 and 11. Nicholds et al. (2018) established that the most important reason for tracking the most important performance indicators should be so that the managers may identify the problems and fix such problems to improve their performances. Major performance measurements are shown in Figure 12.

Figure 12

Company ZYX Major Performance Indicators by Fiscal Year



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
Sales to Customers	7,991	8,866	9,498	9,492	10,257	12,735	12,858	12,880
Contribution Margin	2,397	3,451	3,858	4,148	4,666	5,988	7,099	6,146
Operating Income	(9,867)	(3,424)	(2,037)	(1,073)	(675)	512	563	(11)
Net Income / Loss	(10,296)	(3,847)	(2,336)	(1,478)	4,839	488	537	(20)
Performance EBITDA	(3,203.2)	(2,430.3)	(1,336.7)	(517.4)	256.3	1,179.9	1,338.6	621.5
Net Working Capital	3,323.1	3,818.3	3,643.0	3,571.5	4,659.4	5,767.3	4,080.7	4,640.7
Operating Cash Flow	(4,499.5)	(2,130.2)	(1,864.2)	(871.8)	4,305.4	(35.6)	2,413.2	(21.3)

P1P1 stated that each of the managers is assigned a few performance measures to maintain so they can identify the problem areas and then work towards fixing such problems to drive improvements. P1P1's statement on performance tracking aligns with many peer-reviewed articles on performance measurements. Managers should make reconfiguration choices depending on the outcome of their performance measurements (Shukia & Adil, 2022). For manufacturing companies, these choices should include linking their manufacturing strategies with other strategies, such as business strategies. P6P6 said the on-time delivery is tracked at department levels to identify department areas needing adjustment. For instance, in Figure 2, the design management and configurations director or managers measure the on-time delivery performance of engineering milestones for 2022. Considering Figure 2, the engineering team met all the team's on-time delivery goals except in November. If the engineering department does

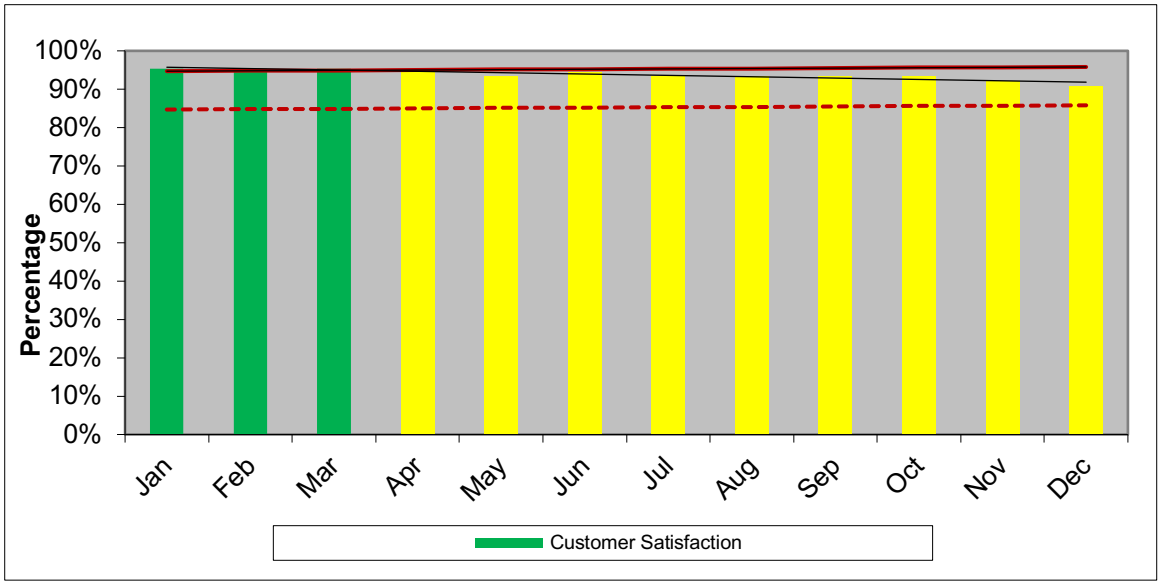
not design on time, post design activities will be delayed, and this could negatively impact the company's overall on-time delivery to its customers. Figure 3 shows the company's on-time delivery to customers for the 2022 calendar year. Figures 1 and 2 look alike. This indicates that engineering on-time delivery, among other things, affects the plant's on-time delivery.

P1P1 and P4P4 expressed that they measure vital indicators such as labor as a percentage of sales, production labor, scrap rate, and the like to identify what aspects of the manufacturing negatively affect the company's performance. It is clearly shown in various available charts that the actions of the managers and their employees at every level affect the overall performance of the company. For instance, an increase in headcount, especially overhead headcount, and overtime premium without a significant increase in sales negatively affected the company in 2022, as shown in Figures 5, 9, and 12. Any significant change in headcount and number of hours worked without a change in sales will affect the company's overall performance in the direction of the change. This means that managers must know that making changes can drastically affect the company's performance. Customer and stakeholder satisfaction are some of the areas that must be met to build a better future for the organization. P6P6 expressed that one of the main reasons for measuring and adjusting these performance indicators at all levels is to satisfy the customers. When customers are not satisfied, they may withdraw their businesses. Figure 13 is the customer satisfaction chart based on surveys sent to customers in February of 2023 for the year 2022. P1P1 lamented that the customer

satisfaction trend is slightly negative owing to the poor on-time delivery affected by labor and material shortages in 2022.

Figure 13

Company ZYX 2022 Customer Satisfaction



Based on the available company documents and participants' responses to the interview questions, Company ZYX's managers use performance measurements to monitor the performance of the company at various levels. Managers must be open to changing environments, technology, and market, then flexible and systematic, especially in handling the key areas that can easily affect the company's performance (Berezianko et al., 2022; Forth & Bryson, 2019). Managers must be quick to understand what to do with the results of their measurements. From the trend in the company's financial statement since the 2015 fiscal year, it is evident that the managers and top leaders have made key changes, including raising product selling prices to drive better financial

performance, according to P1P1. P1P1 said that the decision to change the selling prices of some of their products is due to the results of their various performance measurements, including labor, overtime, materials, and the like. The increase in selling prices positively affected the financial result. Pointing at the sales data while talking about performance measurement, P1P1 expressed,

> We measure your sales and then also our EBDTA. We have the same thing on the graph. Over that same period, this is our EBDTA. You can see that Company ZYX lost money continuously for a very long time. During the sale process, the CEO and president, and I were able to renegotiate pricing with a major customer, as well as a restructuring here to this management group. And now we're able to report it. So that is another way it was. Well, it's effective. It just requires a lot of work to maintain. And that's my job.

According to P1P1, performance measurement has gotten clearer owing to the management group's selling price increase and restructuring. Figure 12 is a chart showing the sales trend over the years. Referring to Figure 4 and Figure 12, P1P1 insisted that the face values of the trends might not look great, but they have value. This participant further said,

> With the projected fiscal year, 2023 earned hours, you can see we are definitely growing our capacity, but it is at a near-term cost for efficiency, productivity, and overtime while we hire and train. To have perspective, you need to know the sales dollar amount for the years and then understand training is not quick

> here. Effective training is longer than most volume manufacturers, I would estimate three months to five years, depending on the position. Because of the learning curve, we are forced to utilize heavy overtime while we ramp up capacity. With new hires and heavy overtime, we encounter inefficiencies and scrap. Through the years, we do increase our rate expectations for pieces per hour, so you can't assume the baseline for 2017 is the same for 2020, as an example. There is also a product mix involved. We are a heavier aerospace project mix than, say, four years ago and heavier aerospace versus industrial than four years ago, so learning curve efficiency opportunities are further apart.

Most managers understand that the primary aim of going into business is economic gain. Considering the company's financial statement, the Company ZYX has not performed significantly well between the 2015 and 2022 fiscal years regarding operating income and net income. Even though the operating and net income are not exceptional, the networking capital has been above $3.5 million from 2015 through 2022.

The outcome of all these aggregate performance measurements is shown in Figure 12. EBITDA is used as the overall performance measurement of the company, according to P1P1. In Figure 12, six high-level financial performance indicators are displayed, namely, sales to customers, operating income, net income/loss, EBIDTA, net working capital, and operating cash flow. Company ZYX lost $9 million, $10 million, and $3 million in operating income, net income, and EBITDA categories, respectively, in the 2015 fiscal year. In 2019, the loss in income decreased to $512,000; the net income

increased to $4.8 million, and the EBITDA increased to $256,000. Income from operations increased to $563,000, net income decreased to $537,000, and EBITDA increased to $1.3 million in the 2022 fiscal year. However, networking capital is steady and positive all through. This indicates that the company has enough capital to cover its obligations, hence why Company ZYX is still in business. The operating cash flow has been mostly negative except in 2019 and 2021. These low operating cash flow values across the years could mean the parent company or external sources have been sponsoring Company ZYX's short-term obligations.

From the six participants' responses, the managers have done great job tracking and measuring the manufacturing costs in most cases. According to P5P5, the costs of maintaining the EPICOR and FlexNet are high. Three out of the six participants expressed that people get hired but may spend over 6 months to a few years in training due to EPICOR and FlexNet setups. These employees might not contribute significantly to the profit margin during the training periods due to low efficiency and productivity. P1P1 explained further,

> Effective training is longer than most volume manufacturers, I would estimate 3 months to 5 years, depending on the position. Because of the learning curve, we are forced to utilize heavy overtime while we ramp up capacity.

Company ZYX's quality system is expensive due to its business model. Company ZYX must pass and maintain certain certifications, such as AS9100 and ISO9001, to stay in business. Maintaining this kind of quality system involves a lot of training for the

entire workforce. The effect of every function affects the overall business outcome. P4P4 explained that training the employees is very rigorous. According to P4P4, because many employees are not technologically savvy, the manager has to develop alternative ways of training such employees, including developing a customized training aid. Often, one training continues for months, if not years, for such employees. A participant expressed that the training is not straightforward, sometimes, because there is an exception in every one of the quality training documents.

Two participants insisted they found the way some operation materials were set up in EPICOR counterproductive. For example, jobs are not set up so that it is easy to deal with the bill of materials, according to P4P4. The operators and production team have difficulties, at times, because of the job sequencing issues. P1P1 expressed that the system is not set up intuitively enough to make it easy to go to the next job if the current job is not possible due to various reasons, such as material issues, employee absenteeism, machine issues, and the like.

Company ZYX has a complicated but robust leadership structure due to its business model. The cost of maintaining this kind of Company ZYX's leadership structure is high. Judging from available financial documents and responses from a few participants, the overhead costs are seemingly high because of the leadership structure. The costs of this long training, job delays due to system setup, indirect operations such as creating new customized training documents, carrying heavy overhead, and turnover related activities might not be captured completely in the metrics. This is why the total

cost of production can be unexplainably high. It might be difficult to explain why the cost of production is high if it is not easy to include all these indirect and unexpected costs in the cost analysis. If the managers focus much on direct manufacturing costs and ignore the other costs, the company's performance will continue to be affected. A few participants agreed that the company loses money because the overall overhead cost of production is too high. For example, the design and configuration team carries a heavy overhead because of the business model and setup. The quality team carries a high overhead cost because of the challenging quality requirements involved due to certifications and industry standards. The maintenance of EPICOR and FlexNet is cost intensive. The manufacturing department is loaded with heavy overhead due to the complexities associated with producing the products and maintaining high-tech equipment. All these (and not just manufacturing costs) contribute to the high production cost, affecting the company's overall performance.

Transformational leaders and followers see challenges as opportunities to solve old problems using new strategies (Demirtas et al., 2020). Judging from their responses to the interview questions, some of the participants indicated that some of the leaders are transformational leaders. One participant expressed, "They love it here; we make high-tech products that people would normally see in magazines." Inspiring the employees to understand how these challenges affect the company's performance would create a positive effect in that the followers will become change agents who consciously get committed to mitigating these hidden and unclear costs. P3P3 expressed that the

production leaders engage their employees in the mitigation strategies, such as cutting down overtime by reducing the absenteeism rate. This participant expressed that the leaders try to make the employees understand that their actions affect the company's bottom line. The leader further explained that the leaders try to let the employees know that their leaders depend on them to solve the problems affecting the company's performance.

Leadership Behaviors and Effects

Pradhan et al. (2019) posited that leaders' behaviors affect the performance of their organizations. Leaders affect what happens in their organizations directly and indirectly through their behaviors and how employees perceive them (Fredberg & Pregmark, 2022). According to Demirtas et al. (2020), transformation involves everyone in the organization, and the transformational leader acts as the change agent who converts the leader's followers to change agents by inspiring and motivating them to place the company's interests above theirs. When employees are inspired or feel inspired, they develop and devote their skills, energy, and creativity toward achieving or even exceeding the organization's set goals with minimal supervision.

The manager's leadership approach affects how employees react to work or transformation. Four out of the six participants expressed that the employees are expected to do their job; if they do their jobs well, they get rewarded. Only one participant expressed that the participant understands that people have bad and good days and that the employees' individual characters are accommodated. The same participant also stated

that goals are set, and employees who meet certain skill requirements will be rewarded. In responding to a follow-up question on employee performance, one participant said, “They either take it or leave it.” This participant referred to the overwhelming tasks and training the employees must undergo to earn their wages. One participant expressed that the system is set up, so there is only one way to go. Basically, the employees must be compliant or face consequences.

Considering the participants' responses to questions on employee treatment, engagement, and motivation, most of the leaders of Company ZYX’s leadership behaviors are transactional, even though a few of the participants might be transformational leaders. Transactional leaders focus mostly on contingent reward and management by exception approach (Bass & Avolio, 1993; Burns, 1978). This kind of leader rewards employees based on their performance towards the goals the leader set for them (Berkovich & Eyal, 202). Continually, this leader monitors the performance and watches out for deviations from the set goals, and then reacts to any deviation as the case may be (Berkovich & Eyal, 202). On the other hand, a transformational leader focuses more on developing and converting the followers into moral agents who place their company’s goals above their individual goals through the leader’s idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass 1990, 1997; Bass & Avolio,1993; Seitz & Owens, 2021). Managers must be willing to lead the organization to success in a timely and cost-effective fashion without

jeopardizing other aspects, including employee welfare, employee voice and opinions, equity, safety, and the like (Demirtas et al., 2020; Nicholds et al., 2018).

Unlike a transactional leader, the transformational leader gives the leader's followers individual attention that makes the followers feel important, valued, and like a part of the organization, and this leader achieves this by using the leader's individualized consideration dimension (Khan et al., 2022; Seitz & Owens, 2021). In the leader's individualized dimension, the leader acts as a personal coach, mentor, or trainer to each follower. In other words, this leader engages with the followers by teaching, treating, coaching, and mentoring each follower individually. A participant expressed frustration in trying to help the followers who are not technologically inclined individually. The leader expressed, "It requires a lot of patience, and that is not one of the virtues I possess."

A few participants expressed frustration with the rigidity of the system. Three participants indicated that most of the jobs in the facility are meant for those skilled and independent. These leaders think there is no time to devote to the followers needing individualized attention. One participant expressed dealing with such individuals as a burden because the leader has to devote individualized time to such employees. Two participants emphasized that some employees are unprepared for these overwhelming training projects. P1P1, among other participants, recognized that the training curve for new employees is long. Another participant also said that some employees do not think they should go through all these pieces of training when they could get less challenging

jobs down the road for the same pay range. A transformational leader achieves employee commitment, loyalty, and citizenship by inspiring the followers to see these challenges as opportunities to develop themselves and solve the company's problems (Bass, 1990, 1997; Seitz & Owens, 2021). When followers are treated this way, the followers are exposed to new learning and skill capacity improvement. Employees who feel they are part of the solution, rather than just getting paid for a job well done, tend to individually innovate, improve their skills, and help transform the organization to an outstanding performance level.

Because of the quality and manufacturing strategies of Company ZYX, the employees may not be motivated to think independently. Several participants, especially P5P5, expressed that the system is set for the employees and poka-yoke is in place in case employees try to deviate from set procedures and goals. A participant recognized that some employees might, sometimes, feel, "Why should we work here and deal with all these rigorous systems when we could go down the road and get jobs for the same rate with less stress." Unlike transformational leaders, transactional leaders do not motivate employees to think independently (Seitz & Owens, 2021). Bass (1990) and Demirtas et al. (2020) expressed that, unlike transactional leaders, transformational leaders charge their followers to form their own opinions about issues and activities in their work environments. Based on the participants' responses, most employees might feel like they are just at work for eight hours, and in the end, they get paid their wages and nothing more. This kind of employee cannot think independently but completely rely on the

leader. In this case, this transactional leader focuses on the set rules and procedures, and there is no room for deviation from the set goals. Through intellectual stimulation, transformational leaders stimulate their followers to develop new approaches, skills, and capacities for solving old problems or challenges in the organization. On this note, a transformational leader motivates and inspires the leader's followers to see challenges as opportunities to solve old problems with new strategies they developed. Sometimes, the followers' ideas and approaches might be better than the leader's and the original setup of the company. This is why the leader must encourage the employees to think individually.

Through the idealized influence of the leader, followers build more trust and become more loyal and committed, then become organizational citizens. When followers become organizational citizens, their commitment and loyalty increase while their intention to quit diminishes (Afshari, 2022; Langat et al., 2021). Using idealized influence, transformational leaders may change organizational cultures to improve operational excellence, employee commitment, engagement, and organizational performance (Afshari, 2022; Bass & Avolio, 1993; Langat et al., 2021). Employees who are committed and loyal improve their individual innovativeness and job performance. This means the employees will develop new skills and ideas that may be better for organizational development rather than completely depending on the leader's ideas. When followers are committed, efficiency and productivity may also increase. The aim of such followers will now grow from just achieving the set goals of the leader to exceeding them. This will, in turn, improve customer and stakeholder satisfaction. The leader's job

includes using a good communication system and other ethical tools to derive loyalty and commitment from the followers. Employees treated with fairness and equity see the organization's challenges as personal challenges.

Transactional leaders mostly lead their followers towards achieving set goals in a set way and do not allow deviations. One participant said, "The system is set, and the employees are required to adhere to the company standards and requirements." Bass (1990) and Burns (1978) posited that a good leader allows followers to be involved in decisions that affect their organization. When employees are not involved in making decisions related to their organization's processes, strategies, financial performance, and the like, they are not motivated to place their company's interests above the employees' interests. Considering some responses during the interview, most of the employees may not see the challenges as opportunities to solve problems. They may see their tasks as routines: a transaction between the leader and the employee. Innovation and upskilling will decline when employees do not see challenges as an opportunity to solve old problems.

Transformational leaders use inspirational motivation to motivate followers to see the organizational vision and strategies as appealing (Bass, 1990, 1997; Shafi et al., 2020). Transformational leaders help their employees see meaning in their current tasks and then induce optimism in future goals by motivating the followers to commit to goals through inspirational motivation rather than using contingent rewards to rouse hard work. Most participants confirmed that many employees, especially the manufacturing

employees with low skills, wages, and education, see Company ZYX's training, manufacturing, and quality systems as challenges rather than opportunities to innovate and upskill. One participant confirmed that the employees and manager, at times, are overwhelmed by the systems' requirements and workload involved.

P1P1, P2P2, and P3P3 specified and were excited about the new pay grade system they recently developed. The pay grade system includes skills and milestones that interested employees must attain to earn the applicable pay grade. This is further evidence that the predominant leadership style of Company ZYX is transactional leadership, even though two or more participants indicated transformational leadership in some aspects. This method of promotion is transactional in nature. The promotion system is based on contingent rewards and leadership by exception. Another difference between transformational and transactional leaders is that a transformational leader uses idealized influence, inspirational motivation, intellectual stimulation, and idealized consideration to help the employees see meaning in their current job and get optimistic about the company's future goals. In contrast, a transactional leader uses contingent rewards to get the employee interested in achieving a set goal of the organization.

The approach used by Company ZYX's managers is mostly transactional because they focus more on showing the employees how much more they can get paid if they do a fixed set of jobs or projects. On the contrary, a transformational leader will focus more on building the employees, inspiring them to see meaning in their jobs, and motivating the employees to see the organizational goals as above their individual goals rather than just

pushing personal rewards as the motivation to do more work. Bass (1990) expressed that such transactional leaders will succeed for a short period and may fail in the future since such leaders do not invest much in the transformation of the employees to activate learning, upskilling, and commitment. A true organizational transformation must involve every stakeholder of the organization. The leader must inspire the entire workforce, not only the leaders, to embrace the organizational transformation with all their hearts, or else transformational initiatives will fail. Transformational leaders focus more on inspiring and motivating followers to see meanings in their jobs and roles. A few participants indicated that they set time aside to engage their employees to understand the values of their work.

Irrespective of a company's leadership style, the most important thing is that the organizational short- and long-term goals are met. Transactional leaders are successful, especially when it involves meeting particular set goals since they are more interested in maintaining the already set goals of their organization. They lead their followers to maintain the existing goals and vision by exchanging rewards for work done by the followers and punishment for poor performance. Bass (1990) and Bass and Avolio (1993) posited that transactional leaders get the job done, especially in the short term, even though they do not promote much employee development, engagement, and commitment. Company ZYX's strategies, considering their product mix, are complicated, and as such, the managers need employees' commitment and loyalty to bolster their organizational performance. Burns (1978) posited that managers must involve the entire workforce in

their decision-making steps, strategies, process choices, and organizational business to be successful.

Communication

Leaders must be able to communicate clearly to avoid confusion and other consequences. Transformational leaders communicate better because they maintain one-on-one relationships with their followers. Unlike transactional leaders, through the transformational leader's approach, deviations from already set goals and systems are considered differently. Such leaders engage the followers to understand what motivates them to deviate. In this way, the leaders explore opportunities that may be available. Good leadership involves two-way communication (Bass, 1990, 1997; Khan et al., 2022). Transformational leaders treat their followers as valuable parts of the organization by clearly communicating goals, results, challenges, and solutions to the followers. Berkovich and Eyal (2021) specified that transformational leaders use ethical leadership in dealing with their followers by engaging in normatively appropriate behaviors in their personal and interpersonal relationships and inspiring their followers to behave the same way. These leaders achieve ethical and successful leadership through the use of two-way communication. Followers make decisions to be loyal, innovate, and contribute to the organization's growth based on how they perceive their leaders, especially using their leaders' communication method as a measure.

Communication is one of the factors that defines a leader or an organizational leadership. One of the most important aspects of good leadership is recognizing.

Transactional leaders recognize their followers by rewarding them for meeting goals and punishing them for not meeting them. A transformational leader recognizes followers at every level through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Langat et al., 2019). Leaders use idealized influence components, including charisma, ethical leadership, and trust to influence their followers. Recognizing is one of the most important benefits of two-way communication (Zunac et al., 2022). Employees are encouraged to become more innovative when they feel their leaders treat them respectfully, especially through oral, written, or implied communication. Some of the participants' statements constitute a good two-way communication system for transactional and transformational leaders. At the management level, the participants indicated that the top leader regularly holds face-to-face meetings with the managers at various levels of leadership. P3P3 indicated holding a face-to-face meeting with his followers. These are indications that some good communications are going on at various levels.

Several participants indicated that the employees are hired to do a job and must get the job done by strictly adhering to the rules and strategies set, even if the strategies and processes are not conducive. In responding to the question involving employee reaction to the organization's strategies, a participant said, "They do not like the fact that they have to do all this training, but that is what the job entails; that is what we got; that is our system."

P1P1 stated that clear and true communication is part of the company's strategy. The participant emphasized that since the participant's communication is honest and true, the followers do not have many responses. In P1P1's words,

> I think everybody is okay with the honest, open approach that I bring and the culture that I try to promulgate into the businesses. Be who you are. And then, we'll try to take the knowledge and experience, and skills of each one of us and complement each other to form the strongest group to move ahead. So, I mean, there's not a whole lot of reaction that can take place when you're talking about the truth other than, "Oh! That's great. Oh! we need to fix that. Oh! We are going to be reasonable about the timeframe. Okay, what's my part?" That is the kind of way it goes.

This participant, P1P1, indicated that there is open communication since the company practices an open-door policy. The participant expressed that the employees love this kind of clear and honest communication. P4P4 explained that they gather their employees together and explain the consequences of their actions toward their jobs. These are some of the pieces of evidence that some of the leaders and actions might be transformational. There is no right or wrong leadership approach. Both transformational and transactional leaders get the job done. However, it is interesting to notice that the company has multiple approaches to leadership under the same leadership. Some leaders are both transactional and transformational, while others are just transactional.

Leaders forget that written communication includes their written job manuals and written instructions or information that warrants that the followers take action or become aware of something (Zunac et al., 2022). Positive and negative messages affect employee emotions, commitment, and loyalty. The quality system in place in Company ZYX is the company's major communication system. Every action at every level is communicated through the company's quality system, FlexNet, or the company's EPICOR. Two participants expressed that the instruction for the floor production employees can be frustrating sometimes. When the system is set up so the followers don't have a voice or input in what is going on, followers tend to feel alienated, less important, frustrated, and unappreciated. Employees, in this kind of approach, may perceive that the leaders are exerting power over them rather than motivating or inspiring them to innovate and upskill. Beuren and Dal Vesco (2022) stated that managers and leaders must be aware of the impact of their communication and leadership on their followers and organization and must pay attention to the four dimensions of the theory of cooperation, namely, (a) learning to share valuable information with the entire stakeholders, (b) improving problem-solving skills, (c) learning to adapt to changes since change is inevitable, and (d) restraint from use of power.

Competitive Advantage

P1P1, P5P5, and P6P6 indicated that there is intense competition and rigorous quality demands in the aerospace industry. P6P6 said that only three companies have the capabilities of designing and producing high-tech aerospace products, like Company

ZYX. Company ZYX must be competitive in various areas, including product and process designs, product pricing, quality of products, and the like. Company ZYX is well equipped with world class equipment and innovation for efficient running of the manufacturing system. There are a lot of new technologies in place, including CNC-equipped machines, internet capable machines, quality measures, test labs, and the like. The ERP and MRP system is complicated and requires high skill to manage. P5P5 expressed that the requirement to maintain and update the quality system, FlexNet, is rigorous and requires high IT skills. This participant also stated that majorly, the maintenance of this system could only be met by IT experts. The quality manager helps manage this system, but his help is limited since the system's design is difficult for a non-IT expert. This is just an example that most people that work in management are highly educated and experienced. Because of the kind of business Company ZYX does, the workforce and equipment are sophisticated to cope with the challenges posed by the industry's competition and its low-volume, high-mix product line model of business.

According to all the participants, Company ZYX stands out in the industry because most of their customers are satisfied. Figure 13 is the summary of Company ZYX's customer satisfaction survey for 2022. Considering the survey result displayed in the chart, most customers are satisfied. Among other participants, P5P5 indicated that auditors are satisfied with Company ZYX because of how the quality system is designed. The participants expressed that they have a competitive advantage over others in the industry due to the quality and manufacturing systems in place. Even though the design

of the systems is difficult: to generate good profit, based on the available data, the systems are robust. Customers trust Company ZYX because the system is set up according to P2P2, P5P5, and P6P6.

The product design and configuration department of Company ZYX is very competitive, according to P6P6, who expressed that Company ZYX is the only company in the industry that has Company ZYX's engineering capabilities. The director of engineering has worked in the same field for over thirty years. The engineering and configuration team is well equipped to work successfully on challenging projects and timelines. Their design processes are organized so that every aspect of design and configuration is addressed promptly. Figure 2 resulted from the engineering team's impressive on-time delivery of assigned milestones in 2022.

The product lifecycle of the product build is organized and clear. The quality procedure (QP) of the product lifecycle is incorporated in a quality procedure referred to as the QP111 document. The responsibilities of each department and function and the procedural steps are clearly described in this document. Describing the document, P6P6 expressed,

> This document will basically give you the product lifecycle of your product build. It identifies the responsibility of program management, quality, design engineering, and configuration control; that's my department. And then process engineering. So, it really defines all of those work groups. And from that standpoint, it identifies what each group contributes to. So, we actually will take

> orders based on a certain type of order, whether it be a prototype order, maybe it's a serial build, or a repeat order. And then we have critical program types, which are typically aerospace programs that identify a more formal design review or configuration review, manufacturing readiness review, and sometimes, we have test readiness reviews that govern how we run a program.

The procedures for the actual design and configuration are incorporated in the QP700 document, according to P6P6. QP700 contains information on design input and output and every detail about the design and development operations. This team uses this document to ensure that the customers' specifications are met. The design and configuration team is made up of design engineers who do the CAD modeling and designs of the product; structural engineers who take care of the finite element analysis; validation engineers who design and carry out the acceptance test plans to validate that the design meets the customer's specifications; and a configuration control specialist who incorporates the drawings and all the data into the main system, EPICOR.

P1P1 indicated that Company ZYX encourages skill development. This participant expressed that the company released a payment-by-skill program to encourage employees to advance their careers. P4P4 and P5P5 explained that there are over a hundred training employees must undergo depending on the employee's job requirements. Due to the quality requirement of the aerospace industry, the employees and their managers must undergo various training, including one-time, reoccurring, and specialized training.

Gathering from the interview data and available company documents, Company ZYX's customers are mostly satisfied with their product quality and timely delivery. P1P1 expressed that the customers are very satisfied with the Company ZYX's management system because the managers communicate with customers no matter what happens. The customers never lack information regarding delays, quality, and other issues.

Gathering from the interview data and company documents, Company ZYX's managers demonstrated innovativeness in various areas, including product and process designs, strategies, systems, training, customer service, and other areas. All these elements of the company are used to determine how competitive it is in the industry. This company has thrived in business for over 30 years. This means that the company is competitive in the industry.

According to P1P1 and available company data, Company ZYX has lost money for a long period because of its product line mix. However, P1P1 expressed that there is an indication that Company ZYX will have a reasonable profit in the 2023 fiscal year. This participant indicated that the company's sales will increase significantly in the 2023 fiscal year. Considering Figures 10 and 12, the company's highest sales were in the 2022 fiscal year at $12.88 million. The company sold over $10 million worth of products by March of the 2023 fiscal year, and at least three more months are left to finish the fiscal year. If the cost of production does not increase significantly and the sales go up significantly, as indicated, the company may end up with an outstanding profit margin in

the 2023 fiscal year. According to P1P1 and P6P6, the managers aim to improve their product mix and attract more business from industries other than aerospace.

Managers and leaders must adopt sustainable measures to stay competitive and profitable. Data trends in Figures 2 through 13 are indications that Company ZYX's leaders have been adjusting their strategies in other to remain profitable and improve their performance. There is a significant decrease in production costs when the 2015 fiscal year is compared with the other years in Figures 10 and 11. In Figure 8, the contribution margin significantly improved in the 2022 fiscal year due to an increase in production efficiency and other cost controls in place. The trends in the Figures and the leadership approach of Company ZYX indicate that a company's leadership has direct and indirect effects on the company's performance outcomes. Company ZYX's leadership, communication, quality, sales, manufacturing, training, and process strategies affect the company's internal and external competitiveness and performance outcomes.

Many published authors expressed that a manufacturing company's competitive advantage and performance reflect its manufacturing strategies (Hubel, 2022; Szabo, 2018). Organizations must adopt innovative ideas to timely transform to be sustainable and competitive in this challenging market characterized by dynamism, extreme competition, and increasing technological changes. According to Szabo (2018), internal competitive advantages are developed through the company's operations. The leaders of a business play an important role in bolstering the organization's competitive advantage (Jnaneswar and Ranjit, 2020). Learning and innovation are the base rocks of competitive

advantage. Technical (process and product) and nontechnical (marketing and managerial) innovations are necessary for growth and improved competitive advantage, according to Amarakoon et al. (2018). Researchers show that transformational leaders build strong internal and external competitive advantages because these leaders inspire and motivate innovation and learning at all levels.

Applications to Professional Practice

In this study, I explored the strategies to implement efficient manufacturing systems to improve companies' performance. Throughout the study, I studied and investigated the strategies manufacturing managers use to implement efficient manufacturing systems to improve their company's performance. The study's findings apply to professional practices as the managers who might read the findings might learn the effects of their leadership behaviors on the performance of their companies.

The applications of the result of this study to manufacturing managers include areas such as selecting of best manufacturing strategies to improve their organization's performance, understanding the implication of each manufacturing strategy choice they make, effects of leadership approach on the organization's performance outcomes, bolstering competitive advantages to improve organizational business outcomes, the effect of employee involvement and commitment on the organization's success, the importance of performance measurements at every level for prompt adjustment of processes and strategies to achieve better performance and the like. There is profound information on the above areas of application in this study's findings. In a nutshell,

successful manufacturing strategies and competitive advantage, manufacturing systems, and leadership behaviors and effects are the three major themes under which the implications are discussed.

Successful Manufacturing Strategies and Competitive Advantage

Manufacturing managers play vital roles in manufacturing organizations, especially in this dynamic global market. The manufacturing strategies utilized by the managers greatly affect the performance of their companies. Argawal et al. (2020) emphasized that company managers must adopt sustainable strategies and practices to meet their stakeholders' sustainable expectations to be competitive, profitable, and sustainable. Company ZYX's manufacturing strategies are reflected in its financial performance. The company's management should adopt systematic and flexible strategies and must be equipped to exceed the company's financial, managerial, and sustainability goals (Berezianko et al., 2022; Forth & Bryson, 2019).

Manufacturing strategy is the ability of the manufacturing leadership to develop capabilities that give it competitive advantages over others in the industry (Hoang et al., 2020; Maldaner & Kreling, 2019). These capabilities must be translated into different forms in every section of the manufacturing organization to meet production demands. Reflecting on Table 2, the participants expressed great confidence in their strategies in various key areas, including quality systems, manufacturing systems, production methods, performance measurement, leadership structure, product design capabilities, training, leadership, and the like. One of the key findings is that the Company ZYX's

quality and ERP systems are their main tools to gain customers' buy-ins and loyalty. Company ZYX centralized all the company's training and key procedures in FlexNet and EPICOR. According to the participants, the customers are happy to be in business with them because all the procedures and activities that will take place throughout the product lifecycle can be located in one place. This strategy is very important owing to the rigor of securing accreditation in the aerospace industry. Company ZYX is ISO9001 and AS9100 certified. Understanding what strategies work best is the key to success. Company ZYX's managers understand that auditors and customers want to see proof that products are produced in such ways that meet the industry and customer standards. With FlexNet, the auditors and customers see all the standards and procedures in one place.

The strategic planning of the production processes is another key area worthy of attention. Manufacturing companies must select and adopt manufacturing processes that are not cost, time, and labor intensive. Managers must plan well in this aspect. Strategies that affect the company's ability to profit are not sustainable. Due to the nature of Company ZYX's business, it is necessary to carry a heavy upfront cost because of the high overhead activities and costs involved, including design, validation, testing, configuration, training, and quality processes. However, the managers must strategize to adjust other areas to increase profit without jeopardizing customer satisfaction and employee welfare. The company's managers use overtime premiums metrics to understand when to increase or reduce manufacturing headcounts. High overtime

premiums can negatively affect the direct cost of manufacturing, as shown in several charts in the findings section.

Training the employees, especially new ones, is one of the most outstanding challenges of Company ZYX. This strategy of orienting new employees is cost and time intensive. Training should be simplified and designed to target outstanding efficiencies. The management allowed such costs to avoid losing or risking their ISO9001 and AS9100 certifications. Managers must make sustainable decisions that can improve organizational competitive advantages and performance. The participants expressed that training an employee takes between 3 months to 5 years. During the training period, the efficiency and productivity of such employee is low. Considering the high turnover rate in the manufacturing industry, especially since COVID-19, this approach is expensive. Roy et al. (2018) indicated that management must use the most efficient manufacturing systems and strategies configured to produce the best product qualities with the least resources and time. Efficient management of time and other resources is the key to successful manufacturing. The managers must continue to improve their strategies to gain better advantages.

One of the greatest strengths of Company ZYX is using metrics to measure their performances at various levels. Figures 2 through 13 are examples of the metrics used by Company ZYX. Golcher-Barguil et al. (2019) emphasized that managers must be capable of measuring their operating performance by using performance metrics that enable efficient management of their processes and operations. Adopting this measurement

strategy is important because, through the metrics results, the managers can adjust their inputs to mitigate their challenges. The manager's aim in measuring these performances is to reduce inputs without focusing much on increasing outputs. For instance, in Figures 5 through 8, the trends are designed to reflect the effects of reducing overtime premiums, direct labor headcount, and past due on the contribution margin. When these three aspects are low, the contribution margin increases without any direct adjustment to it.

One of the findings is that the managers constantly measure their key indicators and adjust accordingly instead of waiting for the overall performance result to come out at the end of the fiscal year. The CEO, directors, and managers decided to increase the product selling price for one of their major customers. This decision was based on the result of some of the metrics. Some performance measurements are used to measure the manufacturing inputs such as labor, materials, manufacturing expenses, and the like. Manufacturing managers must measure and control their manufacturing costs to be successful. Another important implication in this aspect is that manufacturing managers must learn to focus on reducing manufacturing costs without ignoring reducing their other production costs, which can also negatively affect their financial performance. For instance, most of the available Company ZYX’s metrics are focused on controlling direct costs, as shown in Figures 5 through 8. However, from the findings, other functional areas have drastically affected the company's financial performance, which did not get much attention. Figures 10 and 12 reflect the effects of costs on the company’s financial performance. Reflecting on the available company documents, many overhead aspects

are lumped into the manufacturing expenses that caused it to be high; not much attention is paid in this direction, judging from the available company documents and participants' responses.

The operations managers must optimize every process at every level to improve competitive advantage and performance (Kuhnle et al., 2022; Szabo, 2018). Bahria et al. (2019) stated that some strategies for significantly increasing operational cost savings and bolstering competitive advantage are integrating the three main functions of industrial management, namely, production, maintenance, and quality, and setting up and monitoring optimum buffer stocks for the production system. By constantly measuring, comparing, and controlling the activities of these three functions, managers will make timely decisions that may improve their performance. Interestingly, the production and maintenance functions of Company ZYX are integrated, and the quality system is central to all the company's functional areas. One of the challenges expressed by multiple participants in this research is that production scheduling is affected by how the system (quality) is designed. This affects production because the production team does not have control over their schedules and cannot make immediate decisions when the schedules are ineffective. They must wait for the quality system managers and scheduling managers to fix their floor routers before continuing.

Manufacturing strategies are coherent decisions that fall within structural and infrastructural decisions that affect the organization's overall performance. Structural categories such as process technology types, capacity, facilities, sourcing, and vertical

integration must be balanced with the infrastructural categories such as production planning and control, quality systems, human resources, organizational structure, and workforce (Dohale et al., 2022; Olhager & Feldmann, 2018). These two decision categories must be balanced and sound for the company to become successful. Structured manufacturing is essential, especially in achieving the competitive and business goals of the organization.

Olhager and Feldmann (2018) specified that researchers have proven that managers who lead a structured manufacturing organization that develops and links manufacturing strategies to other strategies achieve exceptional performance over others that do not have such structures. In most areas, Company ZYX's managers balanced their structural and intracultural decisions, as indicated by the participants. Using CNCs to offset the low-volume and high-mix product lines' effects on production planning is a typical example of how structural and infrastructural decisions are balanced.

Manufacturing Systems

Based on the findings, Company ZYX's manufacturing systems are complex and expensive. As expressed earlier, FlexNet and EPICOR are the major systems utilized by the organization's leaders. EPICOR is the central system used to control all the aspects of manufacturing and other functions. The company's managers have done a great job developing strategies to manage and mitigate the challenges associated with the complexities of these systems. In managing the manufacturing systems, Shula and Adil (2022) posited that the capability of the manufacturing managers to achieve competing

priorities through their manufacturing system is defined by the manufacturing strategy's configuration choices. Manufacturing choices must be made at the manufacturing strategy formulation level to alleviate manufacturing complications. As recognized by the participants, some of the manufacturing systems' key choices were not considered at the formulation level. As these choices get added or developed, issues and complications may arise. For instance, P5P5 stated that the original designers of FlexNet did not consider the systems upgrade requirements at the initial level. A few years ago, the company spent a huge amount of their company's capital trying to upgrade the system. The system was not operational for a reasonable time because of compatibility issues. This shutdown created a ripple effect in production planning, quality procedures, training, and the like. A manufacturing organization's manufacturing system is crucial in making decisions, especially in the manufacture of goods, cost-saving strategies, and integration of all the organization's functional areas.

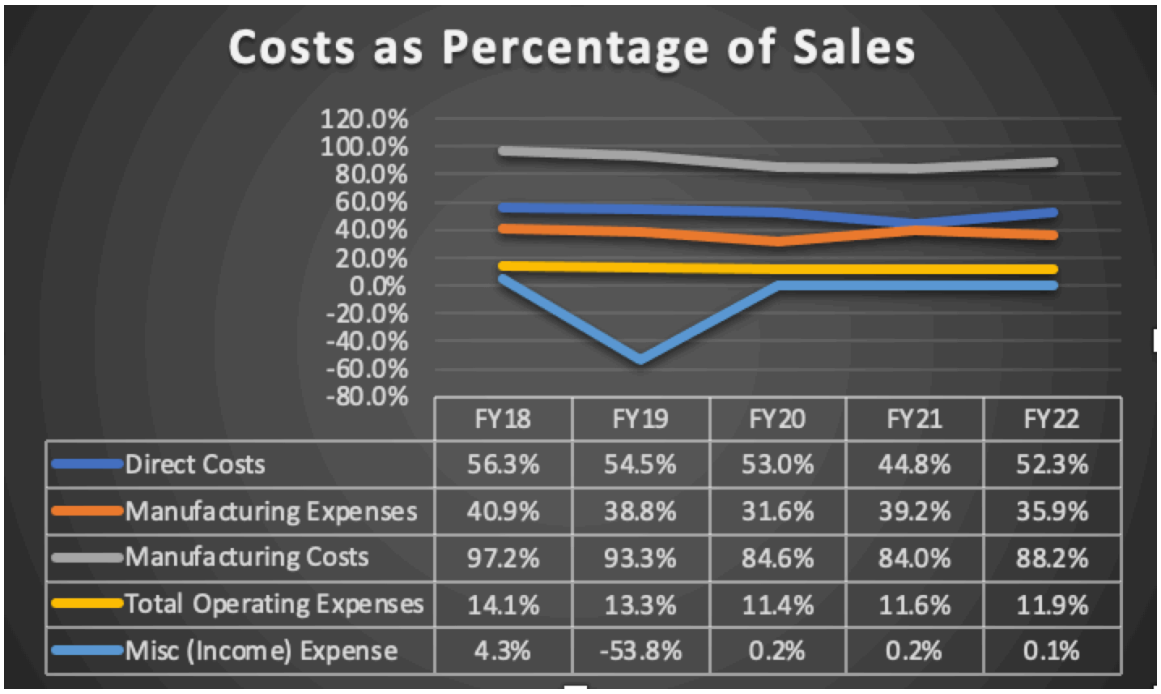
Company ZYX's managers use EPICOR as the ERP and MRP system. They incorporate every aspect of the company's manufacturing business in this system. The company's managers use this system to coordinate all the aspects of their manufacturing operations. EPICOR is used for materials and production planning, cost control initiatives, performance measurements, coordinating program and sales activities, and the like. It is used for inventory control purposes, such as determining what materials are needed, when, and where they are needed. The planning managers use this system to pace materials to production. Job routers from EPICOR are used for job sequencing, including

controlling production processes and activities, and material movements. The managers use this system to define and execute production methods and processes, performance measurements, and cost control systems.

Irrespective of the manufacturing systems used, the leaders' focal point is to use the system to produce and deliver the best quality products with the least manufacturing costs (Roy et al., 2018). The manufacturing costs of Company ZYX across the fiscal years are high, as confirmed by several participants and shown in Figure 14. Focusing on Figure 14, the manufacturing costs are the sum of direct costs and manufacturing expenses. Clearly, the manufacturing costs are above 80 % each year. For instance, in the 2021 fiscal year, the year with the least manufacturing costs, the total cost of manufacturing was 84 % ($10.8 million) of the sales. The total sales were $12.9 million in the 2022 fiscal year.

Figure 14

Company ZYX Costs Analysis (as Percentages of Sales)



	FY18	FY19	FY20	FY21	FY22
Direct Costs	56.3%	54.5%	53.0%	44.8%	52.3%
Manufacturing Expenses	40.9%	38.8%	31.6%	39.2%	35.9%
Manufacturing Costs	97.2%	93.3%	84.6%	84.0%	88.2%
Total Operating Expenses	14.1%	13.3%	11.4%	11.6%	11.9%
Misc (Income) Expense	4.3%	-53.8%	0.2%	0.2%	0.1%

One of the participants insisted that the root cause of Company ZYX's loss of money over the years stemmed from its product line model (low-volume and high-mix product) and the leadership structure that is associated with high overload costs. This participant expressed that if the product line were a high-volume, high-mix model, the upfront costs would have been justifiable since most of the sales would be from serial builds from already established products and customers, and there will be fewer design and prototyping requirements and costs. This result might be reflective of the manufacturing systems used also, especially considering one of the responses of the participants who expressed that the cost of maintaining the manufacturing and quality systems is too high. Several participants expressed frustration with the amount of time

and costs involved in training new employees owing to the quality system and the FlexNet. All these are costs associated with the manufacturing systems in place that might not be obvious initially but show up in the form of high direct and indirect labor and other related costs.

As already established from the findings, Company ZYX used multiple manufacturing and production systems depending on the department, process, or product in place. Apart from the ERP and MRP system, EPICOR, Company ZYX's major quality system is FlexNet, a web-based intranet system that the managers use to house and control all its quality processes and documents. The quality team uses this system to control all aspects of quality in manufacturing operations and beyond. Company ZYX's managers use a total quality management system involving the collaboration of the entire workforce to produce the best quality products to satisfy their customers. This quality system is used to coordinate the management team, the processes, and the procedures of every company function, especially due to the company's ISO9001 and AS9100 standards. In a total quality management system, there is a collaboration of all the organization's employees to efficiently produce the best quality products to satisfy or exceed the customers' requirements (Qureshi et al., 2022). This means that there must be certain standards and procedures that must be upheld to achieve better performance.

The participants recognized that, in some areas, they utilize lean manufacturing tools such as poka-yoke, value stream mapping, lean ergonomics, and kaizen to maximize opportunities. They use value stream mapping to manage materials, especially

during new program launches, efficiently. Poka-yoke is in place in most places. One of the participants expressed that poka-yoke exists in almost every area of the company because quality management uses poka-yoke to prevent employees from deviating from procedures and processes. A participant confirmed that poka-yoke is in place in the production areas to mitigate mistakes and risks and elicit efficiency and productivity.

The flexible manufacturing system is predominantly the production system utilized by Company ZYX's manufacturing managers due to the complexities associated with its product line. The manufacturing floor is equipped with CNCs for easy and quick changeovers and an automatic material handling system since the floor team does not run the same product line all the time for a long period of time. According to Cooper and Taylor (2022), the FMS is equipped with CNCs for the automatic handling of materials and efficient changeovers. FMS and RMS are suitable in production where quick changeovers are important, especially if multiple processes and operations are required to be done using one machine. According to P3P3 and P4P4, they use the same machine for multiple purposes during the manufacture of goods. In this case, there is a need for quick changeovers to justify their capital investments in CNCs and other flexible or reconfigurable features. Company ZYX uses cellular manufacturing systems in the company's welding and functional lab units, according to two of the participants. Depending on the product and quality requirements, Company ZYX's managers use a serial production system. In a serial production system, a multistage system, the

production of products is divided into stages, with the finished product achieved in the last stage (Tayyab et al., 2022).

In a more general sense and considering its workforce planning and efficiency, Company ZYX runs a job shop structure. Cooper and Taylor (2022) posited that job shops are complex shop floor structures because of the multiple different processing routes present in the workstations. With respect to materials management on the shop floor, a push system is utilized due to the complexities involved in manufacturing the products. Due to the product line complexities, the setup times are long; hence the push system for efficient management of the materials flow. The materials manager of Company ZYX schedules production ahead based on ship dates and other considerations. Push systems are characterized by scheduling production ahead, increasing inventory, and working in progress (Chiarini, 2017).

Leadership Approach and Influence

The conceptual framework of this study is transformational leadership. However, other leadership approaches are discussed for comparison and reference. The behavior of the leaders in any given company affects many areas, including employee commitment, organizational performance, competitive advantage, and the like. Burns (1978) emphasized that leaders rarely fulfill the set needs because many leaders do not understand the purpose of leadership and why they are in leadership. Consequently, many leaders cause their companies to perform poorly because they do not understand their roles' importance and effects.

Company ZYX's leaders are predominantly transactional based on the findings of this research. According to Burns (1978) and Bass (1990), transactional leaders use a contingent reward system to accomplish work. Even though many authors, including Alatawi (2017), Bass (1990), Burns (1978), and Demirtas et al. (2020), suggested that transformational leadership is more potent than transactional leadership, Bass and Avolio (1993) established that transactional leaders are also successful in achieving their leadership goals using contingent reward and management by exception approach. Based on the findings, some of the leaders in Company ZYX are transformational leaders who believe in developing their employees by encouraging individual learning, trust, and commitment.

Achieving the overwhelming requirements of Company ZYX is not easy. The complexities associated with the product line, manufacturing systems, and other environmental challenges must be managed properly for better performance. Transformational leaders act as change agents to their followers. Instead of contingent reward and management by exception, transformational leaders use motivation, inspiration, and encouragement to help the followers develop and transform so that they can meet or exceed the organization's set goals. Company ZYX's management team is made up of transformational and transactional leaders. This combination might be beneficial in this kind of company because, using transactional behaviors, transactional leaders can easily achieve their short and long-term goals. In contrast, transformational leaders might exceed the company's goals by developing the employees to innovate,

learn, and expand their skills to improve their company's internal and external competitive advantages.

Considering the findings of this research, the leaders at all levels have affected the company's success. Due to the challenging processes involved in making products at Company ZYX, the leaders play a major role in training the employees to understand the organization's goals, challenges, and processes. A good management system involves good two-way communication. Efficient communication is instrumental to ensuring the employees that they are part of the organization and their contributions are of immense value. A good leader understands that the employees are instrumental to the company's success (Bak et al., 2022). When employees perceive that they are respected, and their opinions matter, they become loyal and committed to the company. Employee engagement improves when employees perceive that they are treated fairly and equitably.

A transactional leader sees employees' jobs as transactions and then offers good rewards for good jobs and punishment for deviating from the set goal. Transactional leaders lead their followers to achieve set goals with minimal or no interest in changing the culture or exceeding organizational goals (Bak et al., 2022, Chin et al., 2019; McKnight, 2013). Transformational leaders may adjust their company's set culture, structure, and vision to achieve success and to reflect the opinions and interests of the followers.

Bass and Avolio (1993) stated that transactional leaders work within the context of the organization's existing culture and base their actions or leadership on the norms

and procedures of the organization. according to Bass (1990), transactional leaders explain the job requirements and compensations that are applicable if the requirements are achieved. In the findings, the leaders set up a payment system by listing job requirements and compensations associated with the requirements. This is clear evidence that transactional leaders, unlike transformational leaders, maintain the status quo instead of fostering a culture of creative change. The pay grade system is in place to excite the employees to advance their skills to get the associated compensation.

Implications for Social Change

The result of this research is a valuable resource for U.S. manufacturing managers because I discussed, in-depth, the strategies that may help U.S. manufacturing managers implement efficient manufacturing systems to improve their company's performance. In this study, the researcher explored successful practices that successful companies used to improve their performances. This study contains valuable information on the strategies successful managers use to implement efficient manufacturing systems through published articles, interview data, and available company documents. This study contains valuable information on leadership approaches and their effects on the success of their companies.

The U.S. managers who might read the results of this study may benefit from it by using the findings as a guide to adjusting their current strategies and adopting new strategies to improve their company's performance. The study's finding has detailed information on efficient manufacturing strategy and process choices, and as such, managers may use it as a reference article. Strategy and process choices are very vital to

the success of the manufacturing organization. Managers' process choices can drastically affect their company's performance, thereby affecting their employees positively or negatively, as the case may be. The U.S. managers could adopt some of the strategies in this study to bolster their performance, thereby improving opportunities for their employees and the societies around them. Employees working in successful manufacturing companies might improve their skills and careers and consequently gain pay increases in return. These employees could also become more competitive in the labor market due to their improved skills. Employees benefit positively when their activities are instrumental to the exceptional performance of their company. Leaders who make the right process and strategy choices may improve their companies' and employees' skills.

Leadership behavior is a big factor in the development of organizations and employees. The leader's role in motivating followers to innovate and improve their skills is crucial. Individual and organizational learnings are essential for improving internal and external competitiveness. Employees improve their living qualities and their company's performance when they learn, innovate, and improve their skills. This study's findings contain valuable information on how leaders can help their followers and companies improve. When employees are transformed, they transform their organizations. Leaders achieve outstanding employee commitment and loyalty by treating their employees with respect. Leaders who see their followers as valuable parts of their organization seem to gain unwavering support and performance from their followers.

Manufacturing companies contribute significantly to the United States and the world's GDP. For instance, in the second quarter of 2022, the manufacturing sector contributed $2,768 billion to the U.S. GDP (BEA, 2022). Managers could apply the findings of this study to their businesses to improve performance, and in doing so, they contribute to the United States and world economies. Another social implication of this study is that successful managers who achieve exceptional company performance, directly and indirectly, provide employment to U.S. residents. According to BEA (2020), U.S. manufacturing companies employ over 15.6 million workers representing about 11% of the GDP. Successful businesses could also contribute to the communities where they conduct their businesses by paying local taxes and investing in socially responsible activities.

These managers may invest more in other U.S. companies by buying raw materials and other services for their production needs. When managers efficiently manage their materials and other natural resources, they reduce the emission of hazards into the environment. These managers can invest in more efficient and environmentally sustainable equipment when they achieve exceptional performances. U.S. successful manufacturing companies' managers could attract foreign investors interested in importing American products into their countries; investing in U.S. stocks; partnering with U.S. companies to extend or establish their foreign products in the United States; and investing in new business startups in the United States.

Recommendations for Action

The findings of this study are useful for various stakeholders, including manufacturing leaders, aspiring manufacturing managers, researchers, academic professionals, and other practitioners. Manufacturing managers and their directors might benefit from various themes discussed in the findings section of this study, including successful strategies, efficient manufacturing systems, leadership behaviors and effects, and competitive advantage. I explored successful strategies that might help these managers excel in their manufacturing leadership. This study's findings contain valuable information on the challenges the research participants encountered and the effect of these challenges on their performances. In the study's findings, I discussed the measures the participants took to mitigate these challenges. The managers and their directors might benefit from the analysis of the challenges in the findings because by understanding the root causes of these challenges and how to mitigate them, they can reinforce themselves and improve their performance.

The leaders provided insights into their leadership approaches, manufacturing systems used, and strategies to execute their jobs. The leaders provided valuable information on their processes and procedures through available company documents. These stakeholders might benefit from the data analysis, especially the effects of the manufacturing costs on the company's financial outcome. They might benefit from the theme of efficient manufacturing systems by understanding what constitutes manufacturing costs and how they affect the company's overall performance. The result

of this study can be used to improve existing businesses and establish new ones. I will endeavor to disseminate the findings of this study.

This study will be disseminated through various avenues. After the chief academic officer approves this study, it will be published in the ProQuest database. The publication will be available to other researchers and scholars. This study will be extended to the participants and their directors for review. With permission from my organization, the study's findings can be used to help our team understand how we might improve our company's performance by presenting a PowerPoint of some key elements of the findings. Finally, the findings of this study will be presented at manufacturing business conferences if there is an opportunity to do so. As a part of an advisory board that focuses on mentoring and training young children in business leadership, I will seek the opportunity to present the study's results in such meetings by providing reading materials.

Recommendations for Further Research

I, in this study, aim to explore the strategies U.S. manufacturing companies use to implement efficient manufacturing systems to improve their company's performance. Considering the study's findings, the leadership behaviors of the leaders reflected in various aspects of their company. Yin (2018) emphasized that limiting the geographical area can affect the generalization of a research outcome. My research involved six leaders of one aerospace manufacturing company in Tennessee, in the southeastern part of the United States, with great experience and background in manufacturing. I suggest that

further research should include other geographical areas and types of manufacturing to improve generalization.

Even though valuable information was gathered on the leadership approach used in Company ZYX, further research should include the followers of the leaders to balance the experience because the employees might perceive the leader's intentions differently. Employees' perspectives and perceptions of their leaders and leadership approaches should be considered. The challenges and experiences the leaders shared might also differ from the challenges and experiences the employees encountered. Understanding how the employees view their leaders, the processes, strategies, and systems need to be researched further.

One of the most interesting aspects of this research is that the leaders of Company ZYX use multiple leadership approaches. In the findings, most of the leaders interviewed are transactional, and the rest are transformational leaders based on the research data. Interestingly, in the findings, the upper management expressed that they are transformational, but it was shown that more than half of the participants are transactional based on the analysis of all the data collected. In other words, the company uses multiple leadership approaches. I recommend further research to include the benefits and effects of a mix of leadership involving transformational and transactional leaders in one company under one leadership.

Further research should also include the effect of each leadership approach on specific kinds of manufacturing businesses. For example, Company ZYX's business mix

involves a lot of long training and documentation that, in general, the employees view as tedious and a burden. The predominant leadership attitude in this company is transactional. Judging from the financial records and participants' responses, the company has not been financially profitable for years. Using transformational leadership, leaders may better motivate and inspire employees to see these challenges as opportunities to solve old problems with new strategies. Transformational leaders might unlock individual and organizational learning and innovation, benefitting the organization in performance improvement and outstanding competitive advantage. Maybe if the leaders were transformational, the employees would be encouraged to be part of the cultural change and organizational transformation because transformational leaders do not just focus on achieving set goals; they are also interested in transforming the cultures and strategies to exceed the organizational goals. Transformational leaders involve their leaders in their decision-making and strategy formulation stages.

The researcher would recommend further research to understand the effects of using multiple manufacturing systems at different levels of the same company. For example, Company ZYX's leaders use multiple production and manufacturing systems depending on the product and processes involved. The leaders identified that they use cellular systems in their welding and functional lab departments, but they use serial manufacturing systems in other areas.

Using an alternative research method for this research to extend the findings regarding transformational leaders and strategies manufacturing managers use to

implement efficient manufacturing systems to improve their company's performance is recommended. Using mixed-research methods may be more beneficial to identify correlations between each leadership style, and the company's performance data can be fully harnessed, analyzed, and compared with industry standards. Researchers combine qualitative and quantitative methods in mixed-research methods. This method will be helpful in collecting and analyzing qualitative and quantitative data, such as financial and other operational data, that may be necessary for determining the influence of the leaders on the company's performance. The qualitative design should be a multiple case study to include other manufacturing types and locations to improve generalization.

Reflections

This doctoral program has been quite a challenging but rewarding journey. In this journey, I developed life-changing virtues and strengths instrumental in finishing the program. Virtues such as resilience, endurance, multitasking, and maturity were among the helpful virtues to achieve this success. As a deeply involved father of two wonderful children that always crave my attention; husband; main breadwinner in my household; active manager in manufacturing operations; a support system for thousands of followers all over the world; a leadership consultant to many managers and leaders; and full time senior pastor of a multicultural church, the journey was not as easy as it might be for a lot of others. My mother and son's health conditions were challenging during the program. I lost my father during this program and had to deal with complicating burial rights due to our cultural background and my father's public status. Balancing all these competing

priorities was quite a challenge. Quitting was not an option for me, even though quitting was tempting. Many people in Africa and the United States depend on me for school fees, house rent, daily living, counseling, direction, and hospital bills, aside from my immediate family's needs. In all, my biggest motivation was to finish the program to inspire my children and all the youth that look up to me to see challenges as opportunities to be greater in life; and that one can become anything one determines to be by prioritizing one's competing responsibilities in the direction of the determination.

I contributed immensely to developing my workplace and communities using knowledge gathered from this study. Better practices were introduced in our company to improve opportunities. We did not shut down our production during and after the COVID-19 pandemic because of the application of the skills from this doctoral study to the management of our production team. Treating the employees as valuable stakeholders in the company and involving them in our strategy choice decisions were some of the tools I used during the COVID pandemic era.

Six experienced leaders who used proven strategies to implement efficient manufacturing systems to improve their company's performance participated in this interview. The experience from the interview process was a great deal to me. The participants were cooperative and could give me some redacted company documents for analysis. Hopefully, they will appreciate and use the findings of this study to improve their strategies, workforce, and performance.

I learned many benefits and lessons during this doctoral study that will remain valuable forever. One of the highlights that emerged during interview data analysis was that leadership is one of the biggest factors in a manufacturing business. Many managers are not aware of the impact of their communication and actions on their company's performance. As Burns (1978) stated, many leaders do not understand the purpose for which they are in business, and many leaders do not realize they are transactional even though their words and a few actions might sound transformational. I look forward to utilizing the knowledge and skill learned from this program to improve my workplace, communities, and household.

Conclusion

I explored the strategies some U.S. manufacturing managers use to implement efficient manufacturing systems to improve their company's performance. The conceptual framework for this study was transformational leadership. The study reflected the effects of transformational leadership on manufacturing companies. The researcher conducted a face-to-face interview involving six leaders of a manufacturing company in Tennessee who used strategies to implement efficient manufacturing systems to improve their company's performance. After the data analysis, I identified five main themes: effective manufacturing systems, successful strategies, operations management, leadership behaviors and effects, and competitive advantages. The themes relate to manufacturing managers' strategies to improve their performance and transformational leadership.

Bass (1990) and Burns (1978) indicated that many leaders are unaware they are transactional in their relationship with their followers. Some of the leaders interviewed referenced that they are transformational leaders, but after data analysis, it turned out they are more transactional based on the analysis of their overall responses. The effects of their transactional leadership on the company's performance were reviewed. One of the key findings is that if employees are not involved in formulating strategies and other vital decisions, they are not devoted and committed enough to place the company's interest above their own interests. With the kind of training and quality systems in place, the commitment and loyalty of the employees are highly required.

The findings included that leaders must measure their activities at each level to discover, on time, what activities and areas need adjustment to improve performance. Manufacturing costs, among other costs, affect the company's financial outcome. Performance measurement is essential for understanding what areas the company gains efficiency and what areas are reasons the company loses money. Operational excellence is the measure of the effectiveness of the management team and their systems. understanding the strengths and weaknesses areas of the company is essential. The other reason for performance measurement is to make decisions about the efficiency of operations and processes.

Bolstering the internal and external competitive advantages of the organization is a key finding in this study. The product and process design capabilities of the company and the management of such translate into competitive advantages. The manufacturing

systems and strategies chosen by the management and directors of the manufacturing company can reflect how the organization competes in the industry. Individual and organizational learnings are important, especially in building stronger competitiveness over others in the industry. The leadership behaviors of the leaders are among the factors that affect individual and organizational learning and innovativeness. If the leaders excite their followers to see contingent rewards as the main reason to get the job done, the followers might not develop into organizational citizens, but if they are motivated and inspired to innovate and learn because their contributions are valuable towards building a stronger tomorrow for the organization, followers will develop and perform better to exceed the company's set goals.

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Appendix A: Interview Protocol

Time of Interview: CDT

Date: April 04, 2023

Background Information

Years of Experience:

Interview Introduction

First, I want to thank you for your time and willingness to participate in this research. My name is Ihebuche Miracle Okorie. I am currently enrolled in the Doctor of Business Administration program at Walden University. The purpose of this meeting is to conduct an interview to explore the strategies you use or have used to implement efficient manufacturing systems to improve your company's performance. Your participation is highly essential for this study, considering your service years and experience in this field. I want to clarify that (a) the interview will be audio recorded and interview notes will also be taken during the interview for coding and analysis and to enable a verbatim interpretation of the interview, (b) all information provided will be treated as strictly confidential and will not be disclosed to anyone, including the employer, (c) names or comments that are mentioned in the interview will be removed from the transcripts and will not appear in the final report, (c) any information provided in any form in the interview session will strictly be used only for this study, and will be presented in a composite form with other participants' data in a doctoral study that may be published, (d) all research records will be protected in a password protected format and locked in a

safe that only I have access for five years after which the documents will be destroyed, (e) you are free to decline to answer any question or withdraw from participating at any point in this interview because this is completely a voluntary session, and (f) there is no award or financial benefit offered in this research at any point.

Thank you for helping me conduct this study. I want to assure you that there are no right or wrong answers, and if you cannot answer any or all the questions, please feel free to let me know. I will ask you a few questions about your experience and background and then proceed to ask you a set of semistructured open-ended questions. Please feel free to elaborate and illustrate as you deem fit while answering the questions. I may ask follow-up questions as needed to clarify the questions because some have different meanings. If there is any need, ask me to restate or repeat any question for clarity.

Finally, I want to reemphasize that this interview is voluntary, and you have the right to decline to answer any or all the questions and to withdraw from participating if you feel the need to do so. I want to remind you that I will be taking interview notes during the interview and audio recording the interview to help with the interpretation stage of this research.

Do you have any questions before we start the interview? Do you need more time to think about your participation? (I will address more issues as and if the need arises).

Research Question

What strategies do U.S. manufacturing managers use to implement efficient manufacturing systems that improve their companies' performance?

Interview Questions

1. What manufacturing systems do you use to improve your company's performance?
2. What strategies do you use to implement your manufacturing systems?
3. What strategies do you think are best for implementing efficient manufacturing systems to improve your company's performance?
4. How do you measure the effectiveness of your manufacturing systems?
5. How did your employees react to your manufacturing systems?
6. What challenges did you encounter while using these manufacturing systems?
7. How did you deal with the challenges you encountered using these manufacturing systems?
8. What additional information would you like to share about the successful strategies you used to implement manufacturing systems that affected the performance of this company?

Interview Follow-up

My name is Ihebuche Miracle Okorie. I appreciate you for participating in this study. I am grateful that you chose to help me. Please remember that the information you provided today may lead to a positive social change, helping other businesses and managers learn better strategies that may promote values and improve businesses. I want

to reassure you that your identity and responses will remain confidential. You may contact Walden University IRB through the email listed on the consent form for any questions or concerns.

Thank you again for participating. I will provide you with a summary of your answers to the interview questions to enable you to verify the meaning, context, and interpretation to ensure that I understand the meanings you conveyed during the interview. Feel free to add any new information you deem necessary. When you get these documents, feel free to review them, and please don't hesitate to call my attention to any part that does not match your meaning. I will also provide you with the analysis of the data from this research in the end. This document will be sent to you by email.

Appendix B: Document Collection Protocol

Name of document	
Date received	
Source	
Document type/format	
Description	
Key Information	