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# Strategies for Sustainable Continuous Improvement Initiatives

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This is to certify that the doctoral study by

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Walden University
2021

Abstract

Strategies for Sustainable Continuous Improvement Initiatives

by

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MS, Western Governors University, 2016

BBL, Ozark Christian College, 2008



Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration



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Abstract

Organizations implementing a continuous improvement (CI) initiative may see 30% or

higher failure rates in sustaining a CI project. Supply chain leaders who lack specific

strategies to sustain CI initiatives longer than 1 year risk financial and resource losses.

Grounded in total quality management, the purpose of this qualitative single case study

was to explore strategies supply chain leaders use to sustain CI initiatives beyond the 1st

year. The participants consisted of six supply chain leaders from one supply chain

distribution organization located in the Midwest region of the United States who

successfully implemented CI initiatives. Data were collected from semistructured

interviews and documents consisting of project forms for control plans and failure mode

effect analysis. Thematic analysis was used to analyze the data. Four themes emerged:

leadership engagement, employee engagement, standardization, and training. A key

recommendation is that supply chain leaders invest in CI methodology training for all

employees, including refresher CI training for leadership, and require leadership

participation and engagement in all CI initiatives. The implications for positive social

change include the potential to provide supply chain leaders with strategies to improve

economic stability for the community, improve supply chain sustainability, and reduce

natural resource consumption.

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Dedication

I dedicate this study to my loving wife (Lucy) for all she did to support our children and me while on this journey. I also dedicate this study to my daughter (Claire) and my son (Elliott), so that they may always seek to change themselves for the better and know that nothing is impossible. Many thanks to my parents, Chris, and Christine Williams, for instilling a passion for learning. Without the support of my family, this would not be possible.

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Section 1: Foundation of the Study

**Background of the Problem**

Supply chain leaders face difficulty sustaining continuous improvement (CI) projects (Nakano & Oji, 2017). McLean and Antony (2014) suggested over 60% of CI projects fail to sustain results and are, therefore, canceled by the project team. Leaders invest considerable effort and funds into creating CI programs in a supply chain organization (Sreedharan et al., 2018). Ineffective leadership and unengaged employees may contribute to a lack of sustained CI projects (Sreedharan et al., 2018). Organizations may require sustained CI initiatives to maintain operating plans for successful outcomes. Priyono and Idris (2018) stated limited research exists on successful CI project sustainment. Therefore, supply chain leaders might require a means to sustain CI programs.

Business leaders use CI to establish an environment that focuses on process improvement to create a competitive advantage (Mohammed, 2017). Organizations that implement CI practices develop a method to decrease wasted resources and increase production capability (Raval et al., 2018). CI methods provide production-based industries with the means to improve and sustain projects with positive economic impacts (Sreedharan et al., 2018). A study on the use of CI in supply chain organizations is relevant because of the need to sustain projects to remain competitive and to control operating costs. Jafarnejad et al. (2017) suggested leaders may benefit from LSS in the long-term strategy required to sustain an advantage in the industry by controlling expenditure and increasing performance.

**Problem Statement**

Supply chain leaders have struggled to maintain CI initiatives to aid in the improvement of processes for increased production rates (Nakano & Oji, 2017). Up to 30% of CI initiatives fail at the organizational level (Antony et al., 2019). The general business problem is that leaders of supply chain organizations are experiencing a high rate of CI implementation failure that could result in wasted resources and additional costs. The specific business problem is that some supply chain leaders lack strategies to implement and sustain successful CI initiatives beyond the 1st year.

**Purpose Statement**

The purpose of this qualitative single case study was to explore strategies that supply chain leaders use to implement and sustain successful CI initiatives beyond the 1st year. The targeted population was supply chain leaders from a single organization located in the Midwest region of the United States who are knowledgeable and successful with strategies to sustain CI projects. The implications for positive social change included the increased delivery speed of goods to consumers and business improvement for the creation of sustainable jobs in areas that are economically depressed. Additionally, society may benefit environmentally from the decrease in the use of materials in the production process and provide sustainability of natural resources.

**Nature of the Study**

Researchers use the qualitative method to understand a phenomenon from the firsthand knowledge of participants (Busetto et al., 2020; Saunders et al., 2015). I selected the qualitative method because of the desire to interact with CI professionals to

understand successful strategies and practices for sustaining performance improvement initiatives. Abramson et al. (2018) noted that researchers use the quantitative method to analyze collected data to test variables' characteristics or relationships through statistical hypotheses. I did not select the quantitative method because I did not use variables' characteristics for analysis to test a hypothesis. Mixed-methods researchers use a combination of qualitative and quantitative methods to explore observational and empirical data (Almalki, 2016). I did not select the mixed-methods approach because of the requirement for quantitative analysis, as my proposed study's purpose only requires the qualitative methodology.

Researchers use a qualitative case study design to explore concepts in a real-world setting and identify non-quantified themes (Heale & Twycross, 2018; Yin, 2018). I selected the case study design because I desired to understand the specific strategies used by the participants for sustaining their CI initiatives. Case study researchers may choose either a single case study within one organization or multiple case studies from several organizations and collect various data types (Yin, 2018). I determined a single case study design as most relevant for interviewing leaders from one particular supply chain location's CI sustainment success. In contrast, ethnographic researchers immerse themselves with participants to understand participants' cultures (Ross et al., 2016). I did not select the ethnographic design since I did not need to immerse myself in a group's culture to address the study's purpose. Phenomenological researchers seek to understand the naturalistic perception of how lived experiences relate to individual participants (Rodriguez & Smith, 2018). The phenomenological design was not appropriate for my

study because I desired to explore the sustainment of CI initiatives and not the personal meanings of the participants' lived experiences.

## Research Question

The central research question for this study was: What strategies do supply chain leaders use to sustain CI initiatives beyond the 1st year?

## Interview Questions

1. What strategies did you use to sustain your organization's CI initiatives beyond the 1st year?

2. What role has the company's leadership played in the organization for the development of strategies for the sustainment of CI initiatives for longer than 1 year?

3. How did you implement employee engagement as a strategy for the sustainment of CI initiatives beyond the 1st year?

4. What training does the organization provide leaders in CI methods and strategies for the sustainability of CI initiatives beyond 1 year?

5. What training does the organization provide employees in CI methods and strategies for the sustainability of CI initiatives beyond 1 year?

6. How, if at all, did you implement policy deployment and control strategies for the sustainment of your organization's CI initiatives beyond the 1st year?

7. What more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year?

**Conceptual Framework**

I proposed total quality management (TQM) as the conceptual framework for this study because of the TQM's focus on CI and leadership commitment. In 1986, Deming introduced TQM to assist leaders with improving product quality and establish CI principles in an organization (Deming, 1986). The central themes of TQM are (a) CI, (b) customer satisfaction, (c) information distributed in the network, (d) leadership commitment, and (e) policy deployment (Deming, 1986; Kaur et al., 2019; Lahidji & Tucker, 2016; Sachdev & Agrawal, 2017, p. 2). Organizational leaders use TQM as a structured CI methodology to reduce and control costs and to increase efficiency in the operating environment through process improvements (Ćwiklicki, 2016; Dadi & Azene, 2017). Leaders may use TQM as a CI strategy to enhance employee engagement through empowerment and enablement (Lamine & Lakhal, 2018; Sreedharan et al., 2018).

Leaders use TQM as a process for CI problem solving and to create employee empowerment and enablement for the implementation of positive change (Ćwiklicki, 2016). Leaders may use TQM as a method to integrate process improvement in all phases of the organization (Kaur et al., 2019). Hedaoo and Sangode (2019) described the specific tools of TQM that leaders could implement to provide customer satisfaction as (a) benchmarking, (b) product design, (c) process design, (d) plan-do-check-act cycle, (e) failure mode and effect, and (f) statistical process controls. An additional TQM method that leaders may use is Hoshin Kanri or policy deployment to strategically plan and implement a plan-do-check-act cycle for a project (Paraschivescu, 2018; Tortorella et al., 2019). Organizations may require the use of TQM to meet the consumer demand for

faster delivery and higher product quality (Kaur et al., 2019). Therefore, a leader's understanding of TQM may provide organizations with strategies for sustaining CI projects.

## Operational Definitions

*Hoshin kanri:* Hoshin kanri is a method leadership may use to deploy process improvement policies across an organization in a strategic manner (Tortorella et al., 2019).

*Kaizen*: Kaizen is a process to provide leaders with a system to quickly implement process improvements from the subject matter expert level and create quick and cost-effective solutions (Chiarini et al., 2018).

## Assumptions, Limitations, and Delimitations

### Assumptions

Assumptions are untestable results that researchers may accept as accurate (Armstrong & Kepler, 2018). I proposed three assumptions for this study. The first assumption was all participants would provide accurate and honest responses during the interview process. Next was that some leaders lack strategies to sustain CI programs in their organizations. Finally, interview responses from the organization's leaders aided in identifying themes for a focus on the research problem.

### Limitations

Theofanidis and Fountouki (2018) described limitations as potential weaknesses for risk or bias that a researcher may encounter when conducting the study. The first limitation that I proposed was the effect of performing a single case study to limit the

amount of data available in a broader context of supply chain organizations. Another limitation that I anticipated was the lack of a large population for the sample size, as I interviewed managers and senior managers from a single organization. A third limitation of my study was the lack of potential access from corporate policies to data points for successful or failed CI projects. Finally, the limitations of the study may not include observational data from small and medium-sized logistics firms.

**Delimitations**

Delimitations are boundaries the researcher sets to safeguard the research and create achievable results with an established scope for the study (Theofanidis & Fountouki, 2018). The first delimitation was selecting a single case study using supply chain managers and senior managers at the distribution center level in the Midwest of the United States. I sought supply chain managers and senior managers with at least 3 years of experience in CI sustainment. Finally, I placed a delimitation for TQM as the conceptual framework for the analysis of the study's findings.

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**Significance of the Study**

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Leaders who develop successful CI initiatives may improve resource use and provide sustainable economic benefits to the organization. Supply chain leaders seek to sustain CI projects and maximize efficiency for higher productivity levels (Kwak et al., 2018). Organizational leaders struggle at supporting, maintaining, and sustaining CI programs, which often results in a high cost to the organization (Sunder & Prashar, 2020). Therefore, organizations could benefit from sustained CI initiatives through increased efficiency and higher-quality goods delivered to the customer (Santhosh &

Baral, 2015). Supply chain CI strategies can aid leaders in sustaining projects for reducing economic costs and increasing operational productivity (Kwak et al., 2018; Madhani, 2016).

Organizational leaders may leverage successful projects to apply cost savings to increase employment income to improve environmental processes for greater manufacturing sustainability (Ben Ruben et al., 2018). A sustainable manufacturing process could reduce the consumption of natural resources and mitigate the environmental impact of wasteful production practices (Kalaitzi et al., 2018). Improved manufacturing sustainability may increase the competitiveness and long-term survivability of the organization and provide financial stability for the employees, families, and surrounding communities (Zimon, 2017). Therefore, sustainable business operations could provide communities with social and economic security by contributing to a higher standard of living and quality of life.

## A Review of the Professional and Academic Literature

For the review of the professional and academic literature, I explored multiple sources related to the research problem for my study. I selected specific resources for the literature review from (a) Walden University Library, (b) Google Scholar, (c) EBSCOhost, (d) ProQuest Central, and (e) Emerald Management. The literature review includes supportive databases from the Walden University Library to search for peer-reviewed and non-peer-reviewed support of the research problem. I searched for specific topics related to continuous improvement, TQM, LSS, and continuous improvement success factors for supply chain organizations. The study findings may provide successful

outcomes for leaders that seek to sustain ongoing improvement initiatives. For this study, I selected seminal texts and peer-reviewed journals using the specific search phrases or keywords: *continuous improvement, supply chain innovation, Lean Six Sigma and logistics, total quality management, lean, kaizen, total quality management failure factors, total quality management success factors, Six Sigma, operations excellence, process improvement, business excellence, theory of constraints, supply chain, and lean management.* I collected 106 sources for the literature review, of which 90 (85%) published between 2017 and 2021 within five years of my projected study completion date. Additionally, of the 106 sources, 103 (98%) were peer-reviewed, and two sources (2%) were seminal books.

In the literature review, I selected literature relating to my research question. The topics and subtopics I addressed in this literature review are continuous improvements, TQM, success factors, failure factors, opposition to TQM, Lean Six Sigma (LSS), lean, Six Sigma, and LSS in the supply chain management. My review of the literature for CI and the use of the lens of TQM may provide leaders with means to identify methods for the sustainment of CI projects. The purpose of my literature review is to provide a solid background of sustainable models for CI implementations that supply chain leaders may use for positive outcomes.

**Total Quality Management**

TQM developed from the existing tenants of quality management and total production improvement used in an organizational environment (Sreedharan et al., 2018). The founders of TQM, Deming (1986) and Juran (1995) asserted the specific lack of

organizational leadership support for failed TQM initiatives and sought to define further

the TQM implementation process (Teoman & Ulengin, 2018). Juran (1995) established a

focus on management in the quality trilogy of (a) planning, (b) control, and (c)

improvement. Teoman and Ulengin (2018) suggested TQM is a crucial component for

the organizational leadership to establish a specific vision, and without a clear vision, the

TQM implementation would fail. Georgiev and Ohtaki (2020) described TQM as a

combination of hard and soft factors. Georgiev and Ohtaki noted that the challenging

elements of TQM derive from Juran's statistical controls and process improvements.

Afrin et al. (2019) noted that Deming created the plan-do-study-act (PDSA) system to

initiate CI programs in organizations. Georgiev and Ohtaki continued that the soft factors

of TQM, as developed by Deming (1986), are necessary to use leadership principles and

executive-level engagement from leadership. Deming (1986) proposed 14 points of

leadership as philosophy to apply quality to any level of the organization as (a) create

consistency and vision, (b) adopt new methods, (c) stop inspections, (d) minimize cost

and multiple suppliers, (e) incorporate on the job training, (f) develop leadership, (g)

eliminate fear, (h) remove inter-departmental barriers, (i) eliminate slogans and targeted

goals, (j) remove quotas and replace with leaders, (k) create pride in the quality, (l)

establish self-improvement, and (m) action from all levels for quality. Georgiev and

Ohtaki suggested that TQM and organizational size may not affect the problematic

aspects of TQM, and size may affect the soft side of TQM engagement to leadership.

*Leadership and Employee Commitment*

Georgiev and Ohtaki (2020) stated the benefit of using soft TQM skills for adherence to policy and developing employee engagement. Saeedi (2017) noted the importance of leadership to grasp change and lead quality components to establish the 14 points of leadership in the organization. Afrin et al. (2019) suggested the organization's culture as defining appropriate TQM tools to create CI projects. Sreedharan et al. (2018) asserted the industry trend to combine TQM and LSS into similar methodologies as TQM focuses on quality improvement, and LSS focuses on incremental change for the customer. The concept of TQM specializes in creating leadership participation and employee empowerment (Sreedharan et al., 2018). Supply chain leaders use TQM tools to improve performance with (a) kanri, (b) statistical quality control, (c) continuous improvement, and (d) quality function deployment (Ćwiklicki, 2016). Ćwiklicki (2016) stated the three main components of TQM as (a) statistical control methods, (b) analysis and planning methods, and (c) improvement and management methods. Hsu (2019) suggested that organizations may benefit from TQM as the method involves (a) process improvement, (b) focus on training, (c) leadership-driven action, and (d) teamwork. However, Hsu posited TQM and organizational training created positive effects on performance. Therefore, supply chain organizations may benefit from the use of TQM to sustain CI projects by developing engaged leaders and empowering the employees.

However, detractors of the success of TQM may exist in opposition to the idea that leaders and employees contribute to positive outcomes. Muruganantham et al. (2018) described a lack of examination of other TQM models of CI, such as six sigma for project developments. Muruganantham et al. further suggested that the lack of developed CI

culture and benchmarking standards created additional TQM barriers in the manufacturing industry. Additionally, Afrin et al. (2019) proposed that TQM leadership's successful application lacks quantitative testing. TQM's use to engage employees may lack successful completion because of cultural development in the organization.

### Quality and Customer Satisfaction

Thai and Jie (2018) and Van Heerden and Jooste (2018) noted that TQM methods might provide supply chain leaders with tools to improve shipping quality and control efficiency. Vouzas and Katsogianni (2018) suggested that TQM offers logistics firms quality solutions to increase efficiency, control cost, and deliver quality to consumers. Vouzas and Katsogianni described TQM use by third-party logistics (3PL) organizations to create customer loyalty by providing exceptional service with on-time delivery. The major components of TQM as (a) customer satisfaction, (b) employee involvement, and (c) continuous improvement (Bauer et al., 2005; Hedaoo & Sangode, 2019; Nguyen & Nagase, 2019). Hsu (2019) noted that executive level-leader support focusing on quality improvements might impact customer satisfaction. Hedaoo and Sangode suggested that the current manufacturing use of TQM transformed from a focus on general quality improvement to a broader focus on the quality of processes for the consumer's benefit. Hedaoo and Sangode noted that the leadership focus on the customer is the primary tenant of TQM over the entire process improvement practice. Hedaoo and Sangode described the specific tools of TQM that leaders could implement to provide customer satisfaction as (a) benchmarking, (b) product design, (c) process design, (d) plan-do-check-act cycle, (e) failure mode and effect, and (f) statistical process controls.

*Success Factors of Total Quality Management*

Diana et al. (2017) stated the positive nature of TQM that creates improved operational practices that increase the organization's efficiency. Galli (2019) suggested that organizational development contains CI processes low in risk or a one-time project implementation that could include high risk. Combining both process and project can significantly increase organizational performance with CI and project management (Galli, 2019). Sreedharan et al. (2018) asserted the foundation of continuous improvement (CI) as the model for which TQM and LSS methodology developed. Sreedharan et al. proposed four main concepts that emerge from the literature that supports critical success factors of (a) training, (b) communication, (c) customer focus, and (d) employee engagement. Bauer et al. (2005) suggested the effects of TQM on an organization relate to management theory. Furthermore, a broader context for CI success researchers may consider rather than relying on the single concept of TQM (Bauer et al., 2005). Yu et al. (2020) noted a positive correlation between TQM and alignment with strategic performance goals as the organizational culture shifts toward quality. The structure of an organization positively contributes to the success of the implemented TQM projects for long-term sustainment.

Lamine and Lakhal (2018) posited that similarities exist between LSS and TQM for organizational leaders' shared application. Supply chain leaders could benefit from the methodology of CI for a basic set of tools to standardize the implementation process for more significant outcomes. The leader may use TQM to focus on quality improvement and control, while LSS provides methods for increasing productivity for better customer

results (Samawi et al., 2018). Prado-Prado et al. (2020) and Kaur et al. (2020) noted that

high commitment levels between senior leaders and middle managers contribute to

successful overall performance growth. Kaur et al. (2019) and Paipa-Galeano et al.

(2020) identified major themes of successful TQM in the literature as (a) leadership

commitment, (b) customer importance, and (c) information distributed in the network.

Additionally, Jusoh et al. (2017) argued that employee commitment is a major theme for

success in TQM practices. Kaur et al. suggested that leadership use TQM as consumers

demand increased delivery speeds and product quality. TQM, Kaur et al. noted, provides

leaders with a method to integrate process improvement in all organization phases.

Moreover, Kaur et al. proposed combining TQM and supply chain management (SCM)

into an innovative concept of supply chain quality management (SCQM) that could

provide leaders with tools for performance outcomes. Supply chain leaders may benefit

from the combined principles of TQM and LSS to sustain CI programs.

Hummour et al. (2018) and Samawi et al. (2018) suggested that employee

involvement is a critical factor in the TQM strategy's success. Sreedharan et al. (2018)

asserted that the success factors of TQM and LSS are challenging to justify in past

research as qualitative studies formulate a substantial portion of the completed research.

Leaders of supply chains may benefit from integrating CI methods and supply chain

management principles as a combined effort to improve (Houshmand & Rakotobe-Joel,

2001). The structure and supply chain flow of goods create an integrated TQM or LSS

implementation approach in tandem (Houshmand & Rakotobe-Joel, 2001). Prado-Prado

et al. (2020) noted team development as a substantial contribution to overall commitment

levels for the observed employee engagement in the organization. Successful engagement empowers the organization's team members to participate in change, creating greater advantage actively (Prado-Prado et al., 2020). Supply chain teams may benefit from TQM and the established management practices set in an organizational environment.

Successful organization CI initiatives rely upon the framework of leader-led projects that empowered the employee to streamline performance and increase the quality of the product for the customer (McLean & Antony, 2014). The TQM and LSS methods require direct leader support and employee support for effective implementation (Mohammed, 2017). Diana et al. (2017) suggested the relationship of corporate use of TQM when implementing a strategy that positively affects performance. Diana et al. noted strategy development as generic in operational practice as organizations consider essential functions of profit increase. Thai and Jie (2018) posited the benefit of firm performance from leadership implementation of TQM principles of cultural development for a change. A positive relationship may arise from a firm that implements both TQM and integration for improvement. Diana et al. suggested that TQM advances organizational performance by advancing product quality and cost reduction as a strategic development tool. Diana et al. further argued that TQM might inhibit creativity and hinder strategic performance improvement. However, Samawi et al. (2018) noted that firm leadership might provide the most substantial impact of excellence success by making reliable strategic decisions and continual TQM analysis by the administration.

Supply chain leaders need to adopt just-in-time (JIT) and TQM practices to increase quality, decrease cost, and improve delivery speed (Mas'udin & Kamara, 2018;

Mwangola, 2018; Priyono & Idris, 2018; Sabri et al., 2018). Mas'udin and Kamara (2018)

suggested that JIT could provide organizations with methods to minimize wasteful

operations, control inventory, and increase production performance. The critical elements

of quality management as (a) top management, (b) quality information, (c) process

management, (d) product development, (e) workforce management, (f) supplier

development, and (g) customer involvement (Mwangola, 2018). Quality management

may provide a systemic structure for supply chain leaders to develop resiliency and

provide specific process improvement strategies such as Lean Six Sigma and total quality

management. Mas'udin and Kamara noted the tools to adapt organizational culture to

process improvement with members' support at all levels. Sawaean and Ali (2020)

posited that TQM aids leaders increase quality, team engagement, continuous

improvement, and leaders' commitment. Sawaean and Ali developed organizational

performance as (a) individual performance by area, (b) adherence to policy in the

organization, and (c) social and economic performance. Organizations that benefit from

JIT produce favorable returns when combined with TQM across the firm (Mas'udin &

Kamara; 2018; Mwangola, 2018). Mas'udin and Kamara posited the benefit that TQM

provides firms using statistical controls to increase quality and improve steady

performance. Hedaoo and Sangode (2019) suggested that organizational success in

implementing continuous improvement projects related to employee engagement of the

process. Leaders primarily valued communication of the TQM process by incorporating

statistical process controls during project completion (Hedaoo & Sangode, 2019). The

adoption of JIT and culture change toward TQM principals may provide supply change leaders with the means to sustain CI implementations in an organization.

Afrin et al. (2019) suggested that tradition could influence management practices as the cultural viewpoint reflects religious convictions. Afrin et al. indicated that seeking quality improvement and removing waste are critical in Islam's daily life to align with TQM practices. Afrin et al. noted the benefit of the individual Islamic practice of organization and efficiency to create a more reliable organization composed of individuals. Vouzas and Katsogianni (2018) noted that both 3PL and firms with logistic functions created quality with benchmarking practices and top management support of TQM. Vouzas and Katsogianni suggested that organizational culture created successful TQM programs in firms that operated logistic services. Afrin et al. argued that critical success factors for TQM adoption rely on leadership commitment and engaged employees' approach to examine the benefits and effects of TQM using a cultural lens for approval.

Introducing improvement programs in an organization could adversely affect the culture (Macht & Davis, 2018). A balanced culture provides an opportunity for successful sustainment as the organization is flexible (Macht & Davis, 2018). Donate et al. (2020) noted that teams benefit from developing employees with training, knowledge transfer, cross-functional teams, and mentoring. Donate et al. suggested that TQM helps social capital directly by leverage the human element to promote collaboration and employee ownership of business decisions. Additionally, organizations that develop healthy human resources practices might increase social capital when incorporated with TQM methods.

Brinia et al. (2020) noted that TQM might provide leaders with tools to establish human resource practices that promote motivation and communication. Furthermore, Hung et al. (2019) proposed the lean application of communication huddles, employee engagement, culture, and fatigue as a means for project success. Employee participation is critical to the sustainment of lean programs to establish employee-led decision-making (Hung et al., 2019).

Huang et al. (2019) suggested the benefit that 3PL firms could provide small and medium-sized logistics firms with inventory control, capital financing, and information technology. Vouzas and Katsogianni (2018) argued that both 3PL and logistics firms used similar concepts of TQM as (a) customer satisfaction, (b) customer deliveries on time, and (c) zero process errors. However, Raval et al. (2019) posited that measurement systems, such as a balanced scorecard (BSC), be adopted by manufacturing firms to increase successful programs' implementation. BSC benefits organizations as the BSC measures only data points that the leadership selects and aligns with the current strategy (Raval et al., 2019). The leadership use of BSC may provide organizations with a balanced method to examine factors relevant to the strategic goals and includes data points from all areas of the operation. Raval et al. described the measurements collected by the BSC as (a) financial, (b) customer, (c) training, and (d) organizational health. The application of TQM to 3PL and BSC may provide supply chain leaders with opportunities to sustain CI programs.

*Failure Factors of Total Quality Management*

Muruganantham et al. (2018) and Yu et al. (2020) suggested TQM as a CI method leaders may use to increase quality and provide higher customer satisfaction levels. According to Silver et al. (2016), leaders use tools to sustain process improvements as team huddles, standard work development, and performance review boards. Silver et al. noted the context of the environment as the instrument for the sustainment of quality improvement. Challenges for supply chain leaders exist in the stakeholder perception to operate efficiently and with strict financial protocols that could limit sustainable practices (Rodriguez & Da Cunha, 2018). The support by leadership and workforce motivation is critical in sustaining a quality improvement program beyond a year (Silver et al., 2016). Dubey et al. (2018) and Teoman and Ulengin (2018) posited that TQM might fail because of a lack of leadership support in the implemented environment and stressed the increased importance of leadership-driven initiatives. Dubey et al. (2018) noted that leadership commitment contributes to the widespread adoption of TQM by an organization, and failure often occurs when leaders resist implementing change. Dobson and Chakraborty (2020) argued the strategic benefit of providing incentives to managers for pursuing more innovative and efficient practices. Leaders who establish common incentives might improve innovation efficiency resulting in supply chain benefits, consumer benefits, and social welfare (Dobson & Chakraborty, 2020). The sustainment of CI programs in an organization may fail if leaders lack an engaged workforce of stakeholders.

Muruganantham et al. (2018) suggested that TQM may provide leaders with disciplined CI programs to enhance service and quality for positive performance

outcomes. According to McLean and Antony (2014), the reason initiatives fail is the lack of clear expectations for the project and the decrease of the traditional culture of change. CI project failure's central premise is the lack of sustained management support over the initiative's timeline (McLean & Antony, 2014; Paipa-Galeano et al., 2020). Muruganantham et al. determined the top barriers for successful TQM projects are (a) lack of leadership support, (b) lack of training, (c) lack of strategy, (d) lack of dedicated resources, and (e) project funding. Muruganantham et al. further suggested that a lack of developed CI culture and benchmarking standards created additional TQM barriers in the manufacturing industry. Mahmud et al. (2019) indicated that small and medium enterprises (SME) lack a strategic focus on the product's quality, resulting in lower performance standards than competitors. Paipa-Galeano et al. (2020) noted that the organization's maturity level might impact the sustainment level of CI programs as each level of maturity increases in CI commitment. SME innovation, Mahmud et al. noted, could directly result from the adoption of TQM methods to develop human management and capability for increased change in the firm. Scarbrough et al. (2015) added that management innovation creates ambiguity as it is hard to define success when building new management techniques. Scarbrough et al. noted that TQM peaked in innovation popularity among organizations and promoted superficial success over sustained innovation. Antony et al. (2019) suggested that the critical points of process failure occur as (a) lack of commitment to change, (b) lack of leadership support, and (c) new teams.

Van Kemenade and Hardjono (2019) suggested that TQM methods shift over time as the organization's leadership and structure develop, focusing on quality, customer

satisfaction, and long-term strategy. Samsudin et al. (2017) noted that internal communications might affect TQM adoption and implementation for quality improvement. Internal communication is dependent on the organizational culture, leadership, and success of TQM practices (Samsudin et al., 2017). Organizational leadership's lack of understanding of TQM communication requirements contributes to a lack of TQM success (Samsudin et al., 2017). Samsudin et al. asserted that employee communication lacks flow to higher levels, and leaders may require future development in this area. Van Kemenade and Hardjono argued that an emergence paradigm allows TQM users to develop a communication strategy to aid in program success that allows for continual change.

However, many researchers (Deming, 1986; Tickle et al., 2016; Ullah et al., 2016; Van Heerden & Jooste, 2018) argued that TQM is a successful tool for leaders to implement in creating effective organizational change. Hung et al. (2019) noted the introduction of lean systems to an organization as a method for leaders to conduct continuous improvement for increased efficiency. Hummour et al. (2018) suggested that TQM success depends on employee engagement and leadership involvement in the strategic improvement process. Jusoh et al. (2018) argued for the use of TQM in manufacturing environments to increase efficiency, improve quality, and employee commitment. While many failure factors for TQM may exist, successful use of TQM to improve performance and increase efficiency occurs in research studies.

**Continuous Improvement**

Business leaders may use CI to establish means for reducing cost and increasing performance for greater quality delivered to the customer (Sreedharan et al., 2018). CI relates to the company-level strategy to implement waste controls and realign resources for the potential of higher returns (Sreedharan et al., 2018). CI methodology incorporates many terms as an umbrella method of similarity of results for (a) TQM, (b) LSS, (c) Lean, and (d) Six Sigma (Lamine & Lakhal, 2018; Mohammed, 2017; Sreedharan et al., 2018). Various researchers initially posited that CI programs benefit the manufacturing sector and may benefit any industry in which CI application occurs (Mohammed, 2017; Sreedharan et al., 2018). The three major components of CI are (a) statistical quality control, (b) improvement of employment and organization longevity, and (c) improved supplier relationships to control costs (Unzueta et al., 2020). The CI methods of LSS and TQM share similarities in both methods seeking to increase quality and increase employee engagement.

*Methods of Continuous Improvement*

Various methods of CI exist for leaders to use for increased quality by improving efficiency. One such method, LSS methods, allows leaders to establish a process to increase production while decreasing wasted outputs. Raval et al. (2018a) argued that LSS combines principles from lean and Six Sigma principles. Raval et al. posited that lean processes allow leaders to control processes and eliminate waste from production. However, Six Sigma allows leaders to decrease quality defects with the aid of statistical process controls (Raval et al., 2018a; Teoman & Ulengin, 2018). The initial formulation

of Six Sigma occurred in the 1970s from the Motorola Corporation, building on the principles established from the lean methods used by Toyota in Toyota Production (Sreedharan et al., 2018). Six Sigma practitioners use the DMAIC process to implement solutions in a practical order as (a) define, (b) measure, (c) analyze, (d) improve, and (e) control (Sreedharan et al., 2018). Galli (2018) described the project lifecycle as (a) starting the project, (b) preparation, (c) carrying out the work, and (d) closing the project. Galli continued that the project management lifecycle would benefit define and improve stages of the DMAIC process. Leaders may depend on both lean and Six Sigma's combined effort to increase employee engagement, control costs, and decrease overall wasted outputs of production.

### *Continuous Improvement in Supply Chain*

Consumers desire to obtain goods and services at a much faster rate than previously in supply chain history (Cappellesso & Thomé, 2019; Madhani, 2019). Researchers posited that organizations incorporating CI processes into the supply chain might see positive outcomes (Houshmand & Rakotobe-Joel, 2001; Martinez-Jurado & Moyano-Fuentes, 2014). Supply chain leadership may benefit from CI methods by analyzing current business practices to understand where to incorporate CI tools (Houshmand & Rakotobe-Joel, 2001). Houshmand and Rakotobe-Joel (2001) argued that CI programs might generate the most efficiency by examining the number of connection points for the distribution centers that operate within a supply chain. Furthermore, supply chain leaders may use the four central tenets of quality initiatives as (a) inspection, (b)

statistical quality control, (c) quality assurance, and (d) strategic quality management (Teoman & Ulengin, 2018).

Teoman and Ulengin (2018) posited that supply chain leaders might use transformational leadership to increase CI method effectiveness in the organization. Leaders that implement transformational leadership into a CI initiative benefit from a long-term strategic focus that creates employee engagement in the process (Teoman & Ulengin, 2018). The failure of CI programs may occur when leaders do not establish clear expectations and strategic outcomes (McLean et al., 2017). Additionally, CI projects may fail due to an absence of support by leaders and the quality of leadership in the organization to push change (McLean et al., 2017). CI success is a leadership-driven outcome due to the failure rate within Six Sigma initiatives (McLean et al., 2017). Transformational leaders who focus on long-term strategy tend to have higher success rates during a change project. Leaders of supply chain organizations face complications in sustaining a CI program for more than a year with high failure rates (Silver et al., 2016). Leaders who incorporate CI initiatives into the organization may develop tools and methods that impact cost and efficiency (Sreedharan et al., 2018). Strategic leaders establish successful CI outcomes by using transformational style to engage employees and develop future-focused outcomes aligned with a CI initiative's desired outcomes.

Zimon (2017) and Shamout (2019) argued the need for supply chain leaders to improve quality and control costs in the modern logistics industry. Ju et al. (2016) suggested that technology provided cost reduction, improved lead times, and higher quality management. Technology innovation may provide methods for an adaptable

supply chain to maintain a competitive advantage. An organizational knowledge gap

exists in the specific improvements for TQM use when used by organizations (Zimon,

2017). Zimon noted that TQM offers (a) the entire organization is committed to quality,

(b) quality to the customer, and (c) management support at each level in the organization.

Zimon argued that TQM specifically improves supply chains by (a) increased quality, (b)

mitigation of loss, (c) competitive advantage, and (d) promote employee engagement.

The organization's use of TQM could provide logistic partners with benefits from

increased quality (Zimon, 2017). Nakandala and Lau (2019) asserted a combination of

lean and agile concepts into a new terminology of leagility to address the need for

increased supply chain timeframes with the fast perishable nature of fresh food. The

organization's creation of hybrid solutions, such as leagility, allow for flexible upstream

and downstream suppliers for increased production. Nakandala and Lau noted the agile

concepts to address the consumer needs that continue to change and the lean concept to

increase productivity at the supplier level.

　　Zwetsloot et al. (2018) noted that challenges to CI use in the supply chain

environment exist as a specific lack of quantifiable studies that reflect positive CI

outcomes. Another challenge suggested by Zwetsloot et al. is the use of specialized

personnel required for training in Six Sigma's statistical nature that may cause some

supply chain organizations to invest overly in human capital. Additionally, Jafarnejad et

al. (2019) described a lack of specific examples using LSS for vertical integration to help

leaders develop a competitive advantage. Nakandala and Lau (2019) suggested that

research into the use of CI on supply chain networks fails to examine the global impacts and instead typically focuses on one singular aspect of a supply chain.

### *Theory of Constraints*

The five major components of the Theory of Constraints (TOC) are (a) identify constraints, (b) exploit constraints, (c) mitigate to the exploitation, (d) raise constraints, and (e) repeat cycle if bottleneck appears (Wu et al., 2020). Modi et al. (2019) noted five additional critical benefits that TOC may offer to supply chain networks as (a) simple operation regardless of size, (b) perceived problems result from symptoms of simple root causes, (c) problems are simple at the core level, (d) current policies and procedure generate a majority of problems, and (e) use of TOC methods to eliminate bottlenecks. Wu et al. (2020) noted that bottlenecks occur in manufacturing when portions of the production process fail to keep pace with the overall process's speeds. Modi et al. asserted that the TOC concept of identifying and removing the core constraints could simplify operations and increase performance capacity. The elimination of physical constraints offers leaders ease of simplification over attempts to remove policy constraints in nature. Wu et al. proposed that controlling production from the front of the process achieves higher efficiency than focusing solely on the bottleneck area. Wu et al. suggested that the implemented TOC plan to control the bottleneck uses the most expensive equipment as the basis for forecasting costs. Modi et al. used a decision tree to explain the root causes found in the organization for slow delivery speeds and higher than average inventory holds. The use of TOC provided the leaders with an extensive network to increase productivity and place tighter controls on profit expenditures. Modi et al.

continued that the benefits of TOC in the supply chain may provide a guideline for large organizations to reduce policies as a constraint to increase network cooperation.

Gupta and Andersen (2018) suggested using a critical TOC concept of throughput/inventory dollar-days (T/IDD) to balance delivery efficiency times and control inventory levels in the network. Garza-Reyes et al. (2019) presented lean methods to eliminate waste in transportation and increased customer value. TOC could provide SC leaders with a methodology to remove restraint areas in the supply chain for increased product flow. Value stream mapping, Garza-Reyes et al. noted a tool to chart the flow of product, motions, and information to visualize bottlenecks that may occur in overall operations. Gupta and Andersen remarked that leaders should implement T/IDD controls to avoid adverse penalties for slow throughput and economic sanctions for purchasing inventory that the organization does not require. Supply chain organizations need to communicate between networks to improve forecasting order requirements by the consumer. A Lean-TOC approach may further aid leaders by identifying bottlenecks that cause waste and remove them (Gupta & Andersen, 2018).

Modi et al. (2019) noted challenges in research as the application of TOC to a particular area of SC, where the removal of constraints may provide benefits in various industries. Additionally, Modi et al. suggested challenges exist in the national focus of TOC in India when an examination of the benefits of the methodology on the global level requires further exploration. Garza-Reyes et al. (2019) argued that a broader application for TOC requires further examination of transportation areas as little research exists on the effects of lean-TOC to improve performance. Further exploration of CI methods, such

as TOC, exists as many research studies focus on local supply chain segments where global effects lack research (Lamine & Lakhal, 2018).

**Lean**

The lean concept developed from the Toyota Production System (TPS) as a method to improve a process by reducing waste and identifying value-added in the system (Bortolotti et al., 2016; Muraliraj et al., 2018). Vaněček et al. (2018) noted using lean techniques used by manufacturers as kaizen, muda, lean, and waste reduction methods. The primary concern of organizational leaders is the reduction of waste as it reflects the significant tenants of lean, (a) to reduce motion, (b) increase the quality of the product, and (c) decrease the time of production. Hines et al. (2020) added specific groups of Lean applications as (a) stabilization, (b) strategy deployment, and (c) sustainability. Hines et al. noted the specific lean tools used by the organization in the stabilization phase as (a) creating standard work, (b) 5S organization, and (c) failure mode and effect analysis. Bortolotti et al. (2016) explored Lean practices and the positive relationship with manufacturing industries to determine means to expand lean implementation processes to other organizations.

Bortolotti et al. (2016) and Osore et al. (2020) suggested the benefit from Lean introduction and implementation is increasing the delivery speed for goods and services. Carter et al. (2017) described lean programs as a benefit to organizations to provide tools to increase efficiency, teamwork and create value. Carter et al. argued against the previous research that lean is a highly useful improvement tool and suggested that lack of consideration for budget constraints occurred in organizational settings. Hines et al.

(2020) suggested that traditional use of lean may result in process failure as organizations place preference on tool implementation of lean. Carter et al. indicated that previous studies used consultant work as the basis for positive lean performance and described a bias that arises from external entities' use. Carter et al. suggested that lean methods created internal pressure for teams to complete new processes resulting in less office productivity. Hines et al. identified opposition to lean implementation as a lack of standard procedure and focused on the short-term gain over strategic results. In the final step of sustainability, Hines et al. described the focus on culture development and shifted toward lean behaviors.

Taherimashhadi and Ribas (2018) suggested the need for lean adoption by the workers at all levels to generate success, and cultural influences may dictate varying degrees of lean success. Bortolotti et al. (2016) argued the need for the network to incorporate lean programs at all levels, both upstream and downstream, to provide the greatest benefit for waste reduction. Bortolotti et al. further noted the established manufacturing relationship to establish lean waste reduction during the production process. Moreover, Taherimashhadi and Ribas asserted that lean programs' Japanese influences might not apply to all cultural environments. However, Hines et al. (2020) suggested that the organization gained the highest lean sustainability with a culture-based approach over a tools-based approach. Carter et al. (2017) indicated the organization's requirement to adopt lean as a value system for successful project sustainment. Taherimashhadi and Ribas continued the dilemma of authority as the national culture may determine that decision authority results at the highest level. Taherimashhadi and

Ribas concluded that national culture directly affects the level of adoption of lean culture as lean processes may differ from the organization's national perspective.

Priyono and Idris (2018) suggested that organizations struggle to implement lean programs system-wide and select specific parts of the lean systems for improved production rates. Priyono and Idris noted that difficulties for lean concepts in remanufacturing occur with the difference in timeframes to produce various products and the variability of what type and quantity of product received. Osore et al. (2020) argued that lean automation offers leaders a blend of an automated process and manual configuration to achieve scalability as an entire automation facility requires extensive investment. Moreover, Priyono and Idris added that full lean adoption might not occur at all levels of the organization, and each piece may adopt various aspects to suit the production needs. Priyono and Idris indicated the issue of leaders expecting immediate returns on lean programs instead of emphasizing a long-term view of lean culture establishment.

**Six Sigma**

Lean concepts, Raval et al. (2018b) noted, focus on reducing wasted motion and resources. Muraliraj et al. (2018) asserted that the Six Sigma methodology relies on statistical concepts to reduce variation by one standard deviation or sigma level. The goal of Six Sigma, Muraliraj et al., continued to achieve a total of Six Sigma levels to reduce variation to a precise variable of defect reduction in the production stream. Muraliraj et al. noted the need for the combined factors of LSS as (a) lean lacks statistical controls, (b) Six Sigma methods cannot increase production alone, and (c) both ways individually

generate economic commitment to achieve success. Ismyrlis and Moschidis (2018)

asserted the components of Six Sigma as (a) statistical process, (b) structured framework,

(c) critical customer quality, (d) design for Six Sigma process at all production levels, (e)

control systems with measurable indicators, and (f) structure of certified Six Sigma

subject matter experts. Raval et al. (2018b) continued Six Sigma's focus on statistical

measures for variation reduction merged with lean methods to become LSS that

positively affected process improvement systems. Ruben et al. (2018) noted Six Sigma to

improve quality using statistical process controls for calculated improvements during

production. Sreedharan et al. (2018) and Phruksaphanrat (2019) argued that the central

premise of Six Sigma relies on the DMAIC process: (a) define the problem, (b) measure

the problem and gather data, (c) analyze root causes and procedures, (d) improve the

process design, and (e) control the updated process for sustainability. Abhilash and

Thakkar (2019) suggested the use of DMAIC to remove defects from the production

process. However, Yadav et al. (2017) noted several inconsistencies and a lack of

positive results from the specific use of the DMAIC framework in Six Sigma initiatives.

Abhilash and Thakkar (2019) suggested that Six Sigma measures defects per

million opportunities (DPMO) as a critical measurement for sigma levels. Abhilash and

Thakkar noted the case study organization used a Pareto chart to identify the top 20% of

production defects and measured against the DPMO to determine process improvement.

The organization implemented the DMAIC process to the manufacturing line and

identified process improvement areas based on root cause analysis. Phruksaphanrat

(2019) asserted the positive gain achieved resulted from a focus on removing errors,

retraining employees, and process changes for greater efficiency. Phruksaphanrat

continued that DMAIC might provide organizations with a positive result in Six Sigma

methods for process efficiency. Soundararajan and Janardhan Reddy (2019) argued that

Six Sigma could be costly to a smaller organization because of the belt-level qualification

requirement. Small and medium enterprises (SMEs) may adopt DMAIC processes at a

lower cost of implementation. Soundararajan and Janardhan Reddy suggested that SMEs'

financial struggles traditionally faced implementing extreme process changes when

DMAIC may provide success as a smaller process.

LSS practitioners may focus solely on lean concepts and mostly avoid the Six

Sigma tools' statistical nature as a lack of training (Rodgers et al., 2019). Rodgers et al.

(2019) suggested lean methods as tools that an organization can use to address efficiency

and quality in a quick timeframe from an operational level. Rodgers et al. noted the Six

Sigma method is the statistical process controls to increase productivity and quality over

a long-sustained timeframe. Ullah et al. (2017) argued that Six Sigma principles could

provide leaders with methods to control and implement projects successfully and reduce

defects. Ullah et al. criticized the use of Six Sigma by some firms for lack of leadership

commitment and lack of statistical training. LSS leaders struggle with implementing Six

Sigma analytical tools for long-term sustainment, and lean methods occur at a higher rate

in comparison (Rodgers et al., 2019). Rodgers et al. continued that a trend emerged for

organizations to rely heavily on lean processes. The trend indicates a decline in the use of

Six Sigma for statistical results. Lai et al. (2018) suggested understanding the importance

of analyzing the vast amounts of data at all levels of operation and seeking ways to

increase a technology advantage in the industry. The benefit of consumer insight

provided by existing data may help leaders analyze and implement improvements for the

customer's value. Additionally, the need exists for supply chain leaders to manage data

and grasp future technologies to create innovation in the organization (Sati, 2017).

Madhani (2016) presented Six Sigma as a continuous improvement tool SCM

uses to improve operating processes and provide higher value to the end customer.

Madhani noted the SCM as a critical component of an organization's success in

generating higher productivity and decreasing operating costs as a part of a value stream

that produces zero income for the business. Madhani suggested that Six Sigma is critical

to SCM to reduce variation and control productivity and inventory levels at all supply

chain systems. The benefit of Six Sigma is lowering the cost of poor quality as a system

that reduces the number of defects produced and provides a better product for the end

customer. Madhani examined the use of Six Sigma in SCM and determined that the

system's critical components of value were the financial benefit to the organization and

the service level benefit provided to the customer. Ismyrlis and Moschidis (2018)

described that Six Sigma is used significantly in North American manufacturing and

spread to the European industry over the last five years. Ismyrlis and Moschidis

suggested that European systems primarily use the International Organization for

Standardization (ISO) 9001 programs for quality measurement in the manufacturing

sector. Madhani concluded that the value of Six Sigma is the improvement in the quality

of the product and the stability of productivity performance across the supply chain

network and suggested the use of Six Sigma as a tool to improve current processes

**Lean Six Sigma**

The LSS methodology began as Six Sigma, developed by Motorola in the 1970s, focusing on statistical process controls to improve a process implementation (Sreedharan et al., 2018). The Toyota Company founded the lean methodology during the renowned Toyota Production System implementation, specializing in reducing waste and improving efficiency to deliver a better product to the customer (Sreedharan et al., 2018). The Lean and Six Sigma methodology's new combination into the LSS method provides leaders with a balanced approach to quality, efficiency, and customer deliverables (Lamine & Lakhal, 2018; Mohammed, 2017). Munteanu (2017) argued the issue leaders face when choosing which method to apply to a given situation as lean and Six Sigma require a specific set of tools to improve the process as the tool may not apply. Munteanu further described lean as a quick analysis solution that leaders use to implement change with low-cost investment. Munteanu continued Six Sigma as a long-term analysis of the organizational process using statistical evaluation and typically required financial investment. Both lean and Six Sigma, Munteanu noted, share similarities in tools as (a) brainstorming, (b) process mapping, (c) standardization, and (d) mistake-proofing.

The LSS methodology is essential to supply chain leaders as a tool to establish lean production process controls and eliminate wasteful actions by defining statistical concepts (Raval et al., 2018a). Leaders in the supply chain, Jafarnejad et al. (2017) suggested, could benefit from LSS in the long-term strategy required to sustain an advantage in the industry by controlling expenditure and increasing performance. Jafarnejad et al. described three critical aspects of successful supply chain management

as (a) percent invested in inventory, (b) inventory turnover, and (c) weeks of supply on hand.

Rodgers et al. (2019) noted lean as a people-oriented, process-driven, and quick problem-solving method to improve operational performance. Rodgers et al. continued that Six Sigma contained a statistical analysis method that allowed users to enhance the quality over long periods with greater control of the process. Zwetsloot et al. (2018) argued the positive benefits of combining LSS and data analytics to increase project success and improve performance. Zwetsloot et al. suggested that data science positively contributes to the LSS methodology as specific statistical concepts for scientific analysis. Zwetsloot et al. noted that data science experts managed successful projects knows from LSS terminology as black belts. Zwetsloot et al. asserted that the black belt typically possessed the statistical skills required to analyze the vast amounts of data examined for each project. However, Nuțoaica (2018) argued against the various certifications for quality programs and the management problem to build a sustainable quality team with experience. Project managers, Nuțoaica noted, struggle to feasibly conclude within financial constraints within the guidelines established in the analysis and planning phases. Zwetsloot et al. suggested that LSS operations require a specialist that understands statistical concepts to interpret data for positive results accurately.

LSS and data science, Zwetsloot et al. (2018) continued to benefit the most from a combination of process methodology and data science methodology. Therefore, Zwetsloot et al. recommended that data scientists and LSS experts train in each method for higher process improvement results. Lean practitioners tend to stay with lean

methodology, and Six Sigma users may consider adapting lean more readily. Rodgers et al. noted that most of the LSS community found a combination of lean and Six Sigma as a vital component of successful continuous improvement. Six Sigma practitioners may consider combining lean into the Six Sigma method as the Six Sigma operator already possessed a basic understanding of statistical process controls. Rodgers et al. suggested that lean users were least likely to add Six Sigma because of the method's statistical nature. Rodgers et al. continued that lean practitioners use statistical training programs to improve a greater combined strength of LSS. Lean and Six Sigma are most effective when used together as LSS, and the future implies that the method will stay relevant to the nature of continuous improvement.

Antony et al. (2019) suggested using lean, Six Sigma, Lean Six Sigma, the primary tools leaders used to implement process improvement projects, and identified failure themes in an implementation. Antony et al. noted commonality between process improvement programs as leaders use similar implementation tools, but high failure rates appear. According to Sreedharan et al. (2018), organizations can benefit from the LSS methodology by increasing productivity and quality. Sreedharan et al. provided the currently understood failure factors as (a) failure to follow the LSS method, (b) failure of organizational strategy, and (c) failure to address the lack of employee engagement. Antony et al. noted that process failure typically occurred during Six Sigma applications because of the lack of understanding of the statistical concepts and indicated an organizational need for training. Leadership engagement is a key critical success factor at all levels of an LSS program.

Gutierrez-Gutierrez et al. (2016) suggested supply chain leaders could benefit from the specific use of LSS practices, such as kaizen, value stream mapping, process mapping, and functional team formations. Antony et al. (2017) noted that the LSS methodology would continue to increase its usefulness as a CI method and increase global capacity as a beneficial tool for developing improvement programs. Industries affected by LSS continue to grow beyond the manufacturing and supply chain as healthcare and finance institutional use of LSS is ever increasing. Antony et al. asserted LSS as an effective method to address change by providing efficiency, employee engagement, and quality improvements to an organization. Antony et al. argued TQM as limiting in the lack of developed methodology, measurement systems, and specific lack of structure for controlling sustained projects. Additionally, a two-process approach may aid logistical leaders using JIT shipping and streamlined payment methods (Gutierrez-Gutierrez et al., 2016). However, Lizarelli and Alliprandini (2020) asserted the effects of lean and Six Sigma as a specific relationship between the level of training and use of advanced tools in the organization and no relation to time investment. Lizarelli and Alliprandini argued that no indication exists for the organizations' performance level achieved by either lean or Six Sigma use. Antony et al. described the future of LSS as (a) globalization of organization, (b) customer demand for higher quality, (c) growth of information technology, (d) increase in data science trends, (e) project requirement of projects, too large for LSS, and (f) education market.

***Kaizen***

Cardoso et al. (2018) and Cannas et al. (2018) suggested kaizen is a Japanese word combination that signifies the practice of continuous change in a rapid process. CI teams use kaizen to reduce wasteful practices, increase value-added events, implement training in lean methods, and continuously improve the process (Cannas et al., 2018; Erez, 2016). Chiarini et al. (2018) presented kaizen's methodology as a part of TPS developed later under TQM systems. Organizations may develop a kaizen program internally to increase productivity with low investment costs (Cannas et al., 2018). The kaizen method may provide leaders with a system to quickly implement process improvements from the subject matter expert level and create quick and cost-effective solutions (Chiarini et al., 2018). Erez (2016) suggested that management investment in kaizen programs is critical for successful programs designed by the kaizen teams. Additionally, Cardoso et al. suggested a four-step process the organization used to implement the change project as a plan, do, check, and act (PDCA) for applied practice to ensure the process's sustainability. Erez argued the impact kaizen might have on supply chains as decreased delivery times and greater inventory control at the distribution level. Dimitrescu et al. (2018) and Erez (2016) suggested the kaizen process as a minimal approach to eliminating production waste, and teamwork guided small projects for low economic cost.

Dimitrescu et al. (2018) described the initial stages for kaizen as formulating by Ono shortly after world war two to standardize manufacturing techniques for the Toyota corporation. Additionally, lean methodology contains five components as (a) implementation of 5S, (b) visual management, (c) standard work, (d) continuous

improvement, and (e) teamwork (Dimitrescu et al., 2018). Cardoso et al. (2018) described

the 5S process as a combined effort of five elements of practice that are: (a) use, (b)

storage, (c) cleaning, (d) health and hygiene, and (e) self-discipline. Management

attributed greatly to a continuous improvement culture with increased employee

engagement using kaizen (Cardoso et al., 2018).

Pakdil and Leonard (2015) described potential challenges leaders might face

when implementing kaizen as a lack of culture established by leadership to foster a CI

improvement environment. Santos et al. (2018) noted that CI users might face difficulty

in the kaizen process due to failure to cost the organization in used production or labor

costs. Additionally, Santos et al. suggested that organizations hesitate to continue future

kaizen events when evaluating past failed events' costs and investments. Leaders also

face challenges in establishing trained kaizen facilitators that may cost additional fees to

hire on a consultancy basis outside the firm (Chiarini et al., 2018).

*Failure Mode and Effect Analysis*

Kwak et al. (2018) noted the relationship between innovation and how supply

chains manage risk to create a competitive advantage. The use of organizational risk

management increased in scope because of supply chain growth in global markets.  Kwak

et al. proposed that innovation is also a risk to be mitigated and can result in positive or

negative outcomes. Wang et al. (2018) suggested using the failure mode and effect

analysis (FMEA) to analyze risk and increase the reliability of programs. Leaders

assigned each risk a risk priority number (RPN) that is then mathematically calculated to

display a numerical risk score for the organizational understanding of what risk to

prioritize for mitigation. The authors proposed introducing a new RPN selection model and quantitative approach to analyze a better industry risk predictor. The proposed RPN analysis could provide leaders with more effective risk mitigation, identify the highest failure modes, and prioritize the risk to mitigate first.

### *Cause and Effect Diagram*

Suárez-Barraza and Rodríguez-González (2019) asserted the leadership issue for identifying the source of a problem in the organization. Rodgers and Oppenheim (2019) and Suárez-Barraza and Rodríguez-González suggested the specific use of a cause-and-effect diagram (CED) as a graphical means for leaders to categorize factors and outcomes. Suárez-Barraza and Rodríguez-González proposed organizations face fundamental root causes that exist as unique foundational problems and relate to specific operational process errors. Suárez-Barraza and Rodríguez-González described CED, also known as a fishbone diagram, to break down a process and effectively view the cause of a problem and identify the actual effects in the application of the process. Leaders may gather employees for brainstorm sessions to explore the specific cause and effect of production processes (Rodgers & Oppenheim, 2019). Furthermore, leaders used CED to implement a five why analysis to examine each method's cause and effect to identify the root cause creating failure in the process. Suárez-Barraza and Rodríguez-González argued that leaders should implement the practice of placing a process problem before seeking the use of a CED as a tool to identify the root cause of the problem. Suárez-Barraza and Rodríguez-González identified common root causes from CED analysis: lack of resources and employee training programs. Suárez-Barraza and Rodríguez-González

described three problem themes that reoccur in CED analysis as (a) personnel, (b) process, and (c) leadership. Suárez-Barraza and Rodríguez-González concluded that CED tools positively influence operational processes and may not prove beneficial for solving large-scale strategic problems.

**Alternative Continuous Improvement Methods**

*Operations Excellence*

Found et al. (2018) and Cayo (2019) asserted operations excellence (OE) as a tool for leaders to use to empower subject matter experts in the organization to implement change projects. Additionally, Found et al. suggested that OE organizations use select existing operation methods to improve the quality of production and efficiency. Criticism for OE, Found et al. argued, exists in the lack of a foundational framework as a tested theory with repeatable and successful business results. Found et al. noted three major tenants of OE as (a) OE, (b) leadership, and (c) knowledge of the consumer. Furthermore, Found et al. suggested four P's of defining OE as (a) people establish OE, (b) partnerships with stakeholders, (c) processes, and (d) products that meet consumer demand. Bauer et al. (2005) described the outcomes of business excellence as (a) success as outcome improvement and (b) success as process ease. Moreover, Found et al. stated that business process lifecycles typically run for 20 years of use and are replaced by new processes. Found et al. described successful organizational OE where employees identify dysfunctions in operation and stop the break before the product flow is interrupted.

Cahyo (2019) suggested that OE contains three elements leaders could use as (a) improvement method, (b) culture, and (c) strategy development.  Tickle et al. (2016)

asserted that researchers might consider excellence concepts similar to TQM in function. Tickle et al. noted the organizational implementation of excellence as (a) strategy, (b) integration, (c) external resources, (d) human considerations, and (e) adaptability. However, Cahyo asserted that OE's use as a tool for strategy development is the most used tool by leaders to improve IT projects. OE practitioners typically view organizational strategy development as a figurative house where the base, columns, and roof provide structure for the strategy. Cahyo described the foundation of the OE house as containing the quality system and daily performance measures.

Tornjanski et al. (2017) suggested leaders use the concept of mass customization to select aspects of OE and quality management to improve the organization across all service levels dynamically. Tornjanski et al. asserted the need for organizations to combine lean and agile concepts to adapt to the fast-changing IT components needed for strategy development. Tickle et al. (2016) argued that leaders might select the appropriate excellence tools available to develop a change strategy in the organization. Tornjanski et al. noted that leaders need to design sustainable developments that address short-term improvements and long-term strategy designs.

### Toyota Production System

The researchers described the Japanese use of TPS as the precursor to modern-day lean methodology in western manufacturing. Chiarini et al. (2018) and Hailu et al. (2018) suggested using TPS and lean aided organizations in reducing process waste, improving quality, just-in-time manufacturing, and increasing production times. Additionally, Chiarini et al. noted that TPS allows an organization to define and identify the root cause

of a problem for ease of solution development. Organizational culture may directly affect

the results of TPS's successful implementation when combined with TQM methodologies

(Hailu et al., 2018). Chiarini et al. argued the dilemma that occurred when implementing

the Japanese method of TPS in a Western manufacturing arena where subtle cultural

ideologies differ. Zen Buddhism's relationship to TPS lies in the basic concepts of Zen

Buddhist practice of process control, improving quality, decreasing wasteful movements,

and focusing on the daily improvement of self. Chiarini et al. concluded that western

implementation of lean methods might benefit from the mental framework that Zen

Buddhism initially provided to the TPS method.

### *Change Management Theory*

Benvenuto (2011) suggested that a high failure rate exists for innovation

improvement programs, and Change Management Theory (CMT) may provide a

framework to guide projects to success. Benvenuto asserted that leaders struggle to

anticipate the human element during change programs as employees often resist change.

Additionally, Benvenuto noted the organization should consider the strategy for the

change, the change leader, the culture, and the leadership support to drive successful

change initiatives. Moreover, Benvenuto argued that organizations need to consider

leadership and management's varying aspects during a change program. Steghöfer (2017)

described CMT as developed for either singular change or continuous process

improvement. A singular change, Steghöfer suggested, applies to a one-time development

that requires the organization to intervene during extreme circumstances. Steghöfer

continued that constant change occurs during small-scale events that do not change the

overall organizational structure. Benvenuto described the advantages of using the CMT
of Kotter's eight-step model for implementing a program that provides a framework for
considering the human element. Steghöfer asserted that future use of participatory socio-
technical would require a more complex CMT project management tool over the
traditional game theory method. Additionally, Binci et al. (2020) suggested process
management allows the organization to focus on long-term strategic developments over
short-term quality deployments using TQM methods.

Ruta (2005) noted the elements of CMT that leaders should use as (a) manager-
driven, (b) environment of trust, and (c) active communication. Furthermore, Ruta
suggested that HR innovation's multinational effect may affect the cultural developments
and legal requirements for regional HR portal development. Ruta continued, employee
acceptance of IT innovation requires consideration by leaders for planned HR portal
introduction. Al Manei et al. (2018) argued the need for organizational adoption of CMT
when using lean methods as the lean process. Additionally, Al Manei et al. suggested that
the Lean process fails to account for basic operations' human element, and change
management could provide a framework for success. Leaders may implement CMT as a
strategic improvement of the organization's culture and behavior to create a competitive
advantage.

Ruta (2005) suggested that leadership failure to address CMT with employees
could lead to resistance because of fear of the unknown. Al Manei et al. (2018) asserted a
high failure rate by organizations because of a lack of employee and leadership buy-in to
daily improvement. Additionally, noted weaknesses of CMT occur in the lack of

empirical evidence to support CMT's benefit for technical innovation in an organization (Steghöfer, 2017). Organizations may face dilemmas when implementing CMT due to the fast nature of technological improvement, creating an unstable change environment (Ratana et al., 2020). Leaders and organizations that fail to adapt to change initiatives may see non-successful outcomes.

**Transition**

In Section 1 of my study, I introduced the study's foundation, the problem, and the purpose elements. I established the research question as applicable to the problem statement. I then provided the descriptions for the study's nature, the conceptual framework, operational definitions, and the significance of the study. Other areas I developed are the assumptions, limitations, delimitations, and a review of the existing literature. In Section 2, I described the purpose statement and focus on the role of the researcher. I also focused on the participants' role, development of the method and design, population and sampling, and ethical research. Furthermore, I described data collection, organization techniques, data analysis, and the reliability and validity of my research study. Section 3 I provided the presentation of the study findings, applicability to professional leaders, and implications for social change.

Section 2: The Project

Section 2 includes the purpose statement of the study. Additionally, I include the researcher's role, participant's criteria, research ethics, study method, and design. Furthermore, I describe the data collection instruments, techniques, organization, and analysis. Finally, I discuss the reliability and validity of the study.

**Purpose Statement**

The purpose of this qualitative single case study was to explore strategies that supply chain leaders use to sustain CI initiatives beyond the 1st year. The targeted population was supply chain leaders located in the Midwest region of the United States who are knowledgeable in the strategies to sustain CI projects. The implications for positive social change included the increased delivery speed of goods to consumers and business improvement for the creation of sustainable jobs in areas that are economically depressed. Additionally, society may benefit environmentally from the decrease in the use of materials in the production process and provide sustainability of natural resources.

**Role of the Researcher**

I served as the primary data collection instrument for this study. Yin (2018) described the researcher's role as the sole gatherer of data from interpreting interactions between the participants and the researcher. Researchers serve as collectors and organizers of data when conducting semistructured interviews (Farquhar et al., 2020). For this study, I served in the role of collector and analyzer of the established data.

Researchers may benefit from a solid understanding of a case study topic (Yin, 2018). I am familiar with the research area of CI and have specific experience as a

certified LSS black belt practitioner. Furthermore, I possess more than 15 years of experience related to supply chain management. I also have management experience interviewing employees for hiring and promotion opportunities. I led teams in both operations and process improvement in large-scale distribution networks at the leader and CI practitioner level. Researchers may benefit from an established relationship with the participants by creating an opportunity for authentic responses to address the research questions (Pinnegar & Quiles-Fernández, 2018). As a CI practitioner, I forged a professional relationship with the participants of the study.

Researchers are responsible for protecting the participants' interests and representing the highest ethical standing for research-based institutions (Greenwood, 2016). Haines (2017) stated a need to develop proper protocols for gaining consent from participants to safeguard participants' rights and privacy. The researcher may achieve ethical results by defining specific responsibilities for the researcher and the participant as opposed to undefined roles (Mathur & Swaminathan, 2018). I remained ethical while performing the research using participant consent, ensuring participant anonymity, and following specific research protocols.

Researchers use the Belmont Report to ensure human subject rights remain protected using ethical research principles (U.S. Department of Health and Human Services, 1979). Anabo et al. (2019) suggested that researchers refer to the Belmont Report to protect the rights and anonymity of the participants. I followed the guidelines and recommendations of the Belmont Report to ensure I conducted ethical research. Furthermore, I ensured that I protected the participants' rights by completing training

from The National Institute of Health Human Subject Collaborative Institutional Training

Initiative (CITI) and provide my CITI number 40268096. Additionally, I followed the

established protocols of the Institutional Review Board (IRB) for Walden University.

As the primary data instrument, I mitigated bias during the case study process by

conducting interviews with participants and recording accurate transcriptions using a

digital device. Yin (2018) asserted that mitigating bias involves the creation of unbiased

questions for participant interviews. Researchers use member checking of semistructured

interviews to ensure accuracy and avoid bias (Birt et al., 2016; Naidu & Prose, 2018).

The use of member checking and sharing the summary of the interview transcript with

the participant aided in data validation by further reflection and response. I then emailed

a summary of the individuals' interviews for the participants to check for accuracy. Each

participant responded to my summary to confirm my interpretation was correct to

complete member checking and achieve data saturation.

I used an interview protocol (Appendix A) during the data collection process to

introduce the semistructured interviews with open-ended questions, along with the signed

consent form to each participant. Yin (2018) suggested the need for an interview protocol

as a means for researchers to establish validity and reliability. Additionally, a researcher's

use of an established interview protocol may provide data related to the research

phenomenon (Brown & Danaher, 2019). I followed the interview protocol for consistent

information sharing of interview questions among each participant.

**Participants**

Participants in this study consisted of professionals with CI experience and the successful sustainment of CI projects. I selected distribution center leaders with specific experience in CI projects and sustaining CI initiatives. The selected participants held the title of manager and senior manager as specific leaders of operational teams in the facility. The eligible participants had experience with (a) at least 3 years of CI methodology experience, (b) knowledge in applying strategies for successful CI programs, and (c) implementation of CI in the supply chain industry. Knechel (2019) suggested that the selection of participants for a research study should align with the desired attributes of a population and with the research question. Researchers may avoid bias by selecting participants from a population with commonality with the research question (El-Masri, 2017).

For my study, I invited participants to participate in the study (Appendix B) using social media. I used social media to seek out participants that met this study's criteria. After ensuring the selected participants met the established standards, I emailed each participant with the written consent form and required acknowledgment of consent returned via email. I supplied each participant with a strict interview protocol during the initial meeting. Researchers may benefit from developing a specific interview protocol by ensuring the interview questions and the research question are in alignment (Majid et al., 2017).

**Research Method and Design**

**Research Method**

I selected the qualitative method for my study. Researchers use the qualitative method to generate responses from participants related to a phenomenon (Turale, 2020). Researchers may use the qualitative method to explore a specific area of focus for a given phenomenon using personal occurrences (Strijker et al., 2020). Additionally, qualitative researchers seek to understand experiences from the participant responses at a personal level (Saunders et al., 2015). I intended to use the qualitative method to explore the personal experiences that supply chain leaders may use to sustain CI programs.

The quantitative method was not suitable for my study. Researchers use the quantitative method to compare specific variables and their relationship to other variables (Yilmaz, 2013). Quantitative researchers consider themselves independent of the research process and do not interact with participants (Saunders et al., 2015). Additionally, quantitative researchers test a hypothesis using surveys and data analysis to statistically measure outcomes (Abramson et al., 2018). Since I did not use statistical tools and I did not test a hypothesis, the quantitative method was not suitable for my study.

Mixed methods researchers use a combination of qualitative and quantitative methods to understand a phenomenon (Almalki, 2016). Mixed method researchers collect data that reflect both personal experience and quantitative data (Sahin & Öztürk, 2019). Furthermore, researchers use the mixed method to examine numerical data when qualitative data fail to develop a complete understanding of a phenomenon (Almalki,

2016). I did not use the mixed method as I did not require the use of quantitative data to understand a phenomenon.

**Research Design**

I used a single case study design to understand strategies for successful CI project sustainment. I used the single case study design to collect participant data from each supply chain leader with experience in the sustainment of CI programs. I did not select multiple case study designs, as I did not explore multiple entities but used an organization for my study. Ridder (2017) suggested the benefit of the use of semistructured interviews during the case study process. Ridder noted that researchers use the case study design to ask open-ended questions to understand the how and why behind a phenomenon. Yin (2018) described the researcher's use of the case study design to ask how and what questions to discover the phenomenon with observation. Additionally, researchers use case study design to review physical data, documents, and semistructured interviews for analysis during the research process (Saunders et al., 2015). Therefore, the case study design was most appropriate since my study involved a semistructured interview of supply chain leaders to understand how and why leaders sustain CI programs.

Researchers may use alternative qualitative design, such as the phenomenological design (Saunders et al., 2015; Williams et al., 2020). Moustakas (1994) asserted that phenomenological researchers attempt to explore the lived experiences of areas of realism and ideas that are difficult to understand. Researchers conducting a phenomenological study gather various data sets from interviews, direct observations, documentation, and on-site visits to gain insight into a phenomenon (Moustakas, 1994;

Rodriguez & Smith, 2018). I considered the phenomenological design and found it unsuitable for my study, as I did not explore the participants' lived experiences.

I also considered the ethnographic design for this study. Moustakas (1994) described the ethnographic design as the development of a cultural understanding of the population over an extended period using direct observation. Ethnographic researchers conduct immersive cultural studies of participants' lives using direct observation over extended time frames (Celikoglu, 2020). Since I did not attempt to observe a culture for an extended time, the ethnographic design was not appropriate for this study.

I ensured data saturation occurred as new data no longer emerged in the research process. Researchers achieve data saturation when themes are exhausted, and the same data continue to reoccur (Fofana et al., 2020). Case study researchers may use participant responses from semistructured interviews, member checking, and archival documents to gather data until saturation occurs (Guest et al., 2020). Data saturation occurred by triangulation from open-ended questions to interview participants until new themes no longer emerged and saturation reached repetitive answers.

### Population and Sampling

I selected the use of purposeful sampling to identify participants for this study. Saunders et al. (2015) stated purposeful sampling is a good fit for case study research because of the small sample size. Qualitative researchers use purposeful sampling to target participants that may provide data relevant to the research question or phenomenon (Ames et al., 2020; Farrugia, 2019). Additionally, Benoot et al. (2016) described purposeful sampling as the selection of participants related to the specific purpose

statement to allow for rich data collection. Researchers using purposeful sampling use their best judgment to determine the participants that appropriately relate to the research question (Moser & Krstjens, 2018). I selected purposeful sampling for this study due to the participants' direct relationship to the research question and the specific purpose of understanding the sustainment of CI initiatives.

For my study, I purposefully selected supply chain leaders with experience in successfully implementing CI projects. The participants selected contained the title of manager or senior manager with direct experience with CI principles and objectives. I selected participants with at least 3 years of experience in CI and operations management. Yin (2018) suggested using four to six participants as appropriate for collecting data when conducting case study research. Roy et al. (2015) noted a direct number of qualitative research participants is not as important as the quality and richness of data collected. However, Vasileiou et al. (2018) argued a specific number of participants does not exist, and researchers determine participants needed to reach appropriate data saturation. For my study, I selected a minimum of five to six participants with specific knowledge of the sustainment of CI initiatives.

I conducted interviews until a point of data saturation occurred. Gentles and Vilches (2017) noted the selected sample might include data sources from an organization and the people selected as participants. Researchers achieve data saturation when themes reoccur from case study interviews and data analysis (Roy et al., 2015). Case study researchers typically use purposeful sampling to select a small number of participants to interview to achieve data saturation (Vasileiou et al., 2018). Blaikie (2018)

suggested that the researcher ultimately determines when data saturation occurs to identify the level of reoccurring themes to address the research question. I conducted interviews until the redundancy of themes occurred to achieve saturation.

I conducted face-to-face or virtual interviews with the selected case study participants. Hill (2020) described the benefit of using face-to-face or virtual interviews to create comfort for the interviewee. The participants selected appointment times and locations to avoid distractions and ensure appropriate privacy levels during the interview process. Researchers may benefit from an established relationship of rapport with each participant by building trust and creating an environment of comfort (Brown & Danaher, 2019). Each interview consisted of a 60-minute timeframe according to the established protocol (Appendix A). Yin (2018) prescribed adequate interview time as 60 minutes and encouraged an interview protocol. To ensure participant comfort and readiness, I reminded each of the 60-minute timeframe to allow for appropriate answering of the semistructured interview questions and promote the open exchange of ideas.

## Ethical Research

I ensured that during the informed consent process, the participants understood the study requirements, withdrawal procedure, and confidentiality protocols. Each participant holds the right to consent to join a research study (Mathur & Swaminathan, 2018). Participants received an informed consent form to ensure that they understood the study and the withdrawal process (Haines et al., 2017). The informed consent form included the purpose of the study and participant selection criteria. Using email, participants acknowledged the consent form in conjunction with the Walden University

IRB process. For record, I provided a copy of the consent form to each participant. Participants were permitted to withdraw from the study by notifying me by email, in person, or by phone until member checking was complete. Walden University's approval number for my study is 05-17-21-0983482, and it expires on May 16, 2022.

Measures occurred to ensure each participant's ethical protection followed the informed consent process and the established protocols of the Walden IRB standards. Participants did not receive compensation for participation in this study. Participants have the right to stop the study and withdraw at any point during the study process (Pinnegar & Quiles-Fernández, 2018). Participants are under no obligation to participate in a study and may elect not to volunteer (Al Tajir, 2018). Additionally, I ensured that the participants were comfortable during the interview and allowed the participant to decline to answer any question. Each participant was allowed to stop participating in the study at any time. Henderson (2016) described the need for researchers to protect the specific rights of each participant. My study's research question aligned by ensuring the participants contained expertise and experience in strategies for the successful sustainment of CI projects. I preserved the anonymity and integrity of the participants of this study by ensuring the confidentiality of the data. Data collection occurred from participant interview response and transcription with member checking for organization and further analysis.

The confidentiality of each participant includes safeguarding identity and information as a researcher's responsibility (Yin, 2018). The data I collected will not reflect the names or identifying information of individuals or organizations. Petrova et al.

(2016) and Surmiak (2018) suggested using alphanumeric codes to mask the participants' identity to ensure the confidentiality of the individual. I used unique alphanumeric codes to protect the identity of each participant. The supply chain organization's leaders included the use of codes L1, L2, and L3 to protect each participant's identity.

Researchers have a responsibility to protect the anonymity and confidentiality of any data collected for each participant's rights (Bhatia-Lin et al., 2019). Saunders et al. (2015) suggested using a safe location with locking ability to store and safeguard any data related to the research study. I stored all data in a fireproof safe in my personal office for five years to protect participants' rights and confidentiality by ensuring that digital data is encrypted. After the required five years, I will destroy all collected hard data and delete any digital data.

## Data Collection Instruments

As the primary data collection instrument, I used semistructured interviews with open-ended questions to collect data related to the sustainment of CI initiatives. I used semistructured interviews as the data collection process. Researchers use an interview protocol to convey the purpose, rights, consent, and withdrawal procedures to the participants (Yeong et al., 2018). Researchers use open-ended interview questions to understand a phenomenon considering each participant's responses (Yin, 2018).

I used semistructured interviews with open-ended questions to supply chain leaders to understand the phenomenon behind the sustainment of CI projects. Li et al. (2019) stated that researchers might use open-ended questions to collect detailed experiential responses to a phenomenon. Researchers also use open-ended questions to

provide opportunities for participants to share information in a precise manner (Tasker & Cisneroz, 2019). Qualitative researchers use semistructured interviews to collect data in the case study design (Morgan et al., 2017). Supply chain leaders may feel comfortable providing in-depth answers to semistructured interview questions related to the sustainment of CI programs.

I conducted face-to-face or virtual interviews with an established interview protocol (Appendix A) for the interview process. Additionally, the accomplishment of face-to-face or virtual interviews occurred virtually using Cisco WebEx to create comfort for the participant if Covid protocols are in place (Hill, 2020; Irani, 2019). Saunders et al. (2015) suggested that case study researchers use face-to-face or virtual interviews as the primary means for data collection. I recorded each participant's interview using a digital recorder for greater accuracy. Researchers may benefit from a recording to accurately reflect the participants' data for the interview transcription process (Hakoköngäs & Asiala, 2020).  Furthermore, the participants secured private locations for face-to-face or virtual meetings. Researchers must consider the participant's comfort by ensuring a relaxed environment for the open sharing of information (Al Tajir, 2018). Allowing the researchers to schedule a time and location that is convenient for each participant may enable the participant to become relaxed and comfortable for interview responses.

I collected additional data in the form of physical documents related to the sustainment of CI initiatives. The physical documents I sought to collect were project charters and FMEA associated with the sustainment of the CI program. Case study researchers may collect various data types to explore a phenomenon, such as physical

documents, member checking, semistructured interview questions, and open-ended questions (Gebauer et al., 2017). Additionally, the use of physical or archival documents allows the research to explore data beyond the semistructured interviews toward achieving methodological triangulation (Fusch et al., 2018).

The use of member checking for additional participant responses assisted the researcher in the collection of data related to the sustainment of CI projects. After completing the face-to-face or virtual interview, I transcribed, summarized, and emailed each participant a summary of the interview to verify the accuracy of the data. Researchers use member checking to accurately reflect the participant responses for validity (Birt et al., 2016; Caretta & Perez, 2019). Member checking will allow the researcher to share the summarized responses to create additional means for collecting additional data from participant verification of the completed interview (Naidu & Prose, 2018). I emailed the transcription summary to each participant and allowed the participant to respond to the interview data's validity and reliability.

Researchers may use a combination of interviews, physical documents, and member checking to increase the reliability and validity of the collection of data (Gebauer et al., 2017). I used methodological triangulation to collect and analyze data from multiple sources to establish rigor to sustain CI initiatives. Triangulation allows researchers to use various data points to confirm the research's reliability and validity (Fusch et al., 2018). Using multiple sources of data, I ensured the reliability and validity of the research related to the sustainment of CI projects.

**Data Collection Techniques**

This study included open-ended questions and face-to-face or virtual interviews to explore participant responses to sustain CI initiatives. Researchers use open-ended questions to increase the participants' responses in the interview (Edwards & Holland, 2020). I used face-to-face or virtual interviews with live video to observe participant responses directly and watched for verbal and nonverbal cues. Participants may provide cues related to body language, position, tone, and behavior during the interview process that may provide additional data for the researcher (Irani, 2019). Furthermore, interviews allow the researcher to contain the flexibility to ask further probing questions to engage in more in-depth responses (Edwards & Holland, 2020). To address the research question, I used face-to-face or virtual interviews with open-ended questions to explore how supply chain leaders sustained CI programs.

The four to six supply chain leaders selected as participants underwent a face-to-face or virtual interview using an established interview protocol (Appendix A). I used the established interview protocol to aid in conducting the face-to-face or virtual interviews by providing structure. The interview protocol included the study's purpose, participant rights to consent, and withdrawal procedures (Summers, 2020). To aid in reliability, I asked all participants the same open-ended questions from the interview protocol until a point of data saturation occurred. Researchers achieve data saturation when conducting face-to-face or virtual interviews when themes continue to reoccur and new data collection fails to exist (Guest et al., 2020).

I used a digital voice recorder for each participant's face-to-face or virtual interview. Petrova et al. (2016) stated the researcher's use of a recording device ensures an accurate collection of data that occurs free from possible error, relying only on the researcher's memory. Additionally, for the participants' protection, the interview protocol included informing them of the recording and requesting permission to record. Researchers develop trust and establish comfort by establishing consent from each participant to record the entire interview (Kutrovátz, 2017).

The use of journal notes occurred as another means to record the data and served as a backup if the participants declined the consent to record the interview. I used journal notes to record my observations from the interview in the unlikely event that the recording process failed. Researchers use journal notes to record observations during the interview process that a recording may not capture, such as nonverbal cues and body posture (Annink, 2017). Journaling may provide researchers with additional means for multiple data collection points to increase the interview's accuracy (Phillippi & Lauderdale, 2018). I used journaling in the interview process to back up the response recordings and to document observations that may not reflect on the record of the face-to-face or virtual interview.

Face-to-face or virtual interviews may provide researchers with the risk of interviewing from uncontrollable circumstances that may arise, such as the distance of travel, cost, and lack of responses from the participant (Solarino & Aguinis, 2020). Researchers may face challenges using virtual methods to conduct interviews as the researcher cannot observe the environment, and some participants may lack comfort

using technical means (Irani, 2019). Participants may be reluctant to answer questions accurately when discussing specific topics or express nervousness during the recording process making the participant uncomfortable (DeJonckheere & Vaughn, 2019). Additionally, recording devices may fail to capture the entire participant interview if the technology fails. The researcher may need to rely upon memory using notes taken during the interview (Rutakumwa et al., 2020). Researchers with weak interview skills may fail to collect the rich data required to collect necessary data (McGrath et al., 2019). Furthermore, researchers may relieve some of the potential interview risks by ensuring the informed consent procedure occurs (Yeong et al., 2018), and the interview location provides comfort to the participant (McGrath et al., 2019).

For each participant interview, I planned to allow for a full 60 minutes in each interview length. Researchers may allow for a varied interview length of around 45-60 minutes to seek as much viable data as possible from each participant (Hakoköngäs & Asiala, 2020). Participants may lose focus and choose to rush responses in an interview that exceeds 60 minutes due to the need to return to the workplace (Hakoköngäs & Asiala, 2020; Solarino & Aguinis, 2020). As part of the interview protocol, I ensured each participant acknowledged a total allowed time of 60 minutes to respect the participant's time.

After the participant completes the interview process, I transcribed the interview and contacted the interview via email for member checking of a summarized report of the responses. Researchers use member checking to review the transcribed summaries and confirm the information is correct (Birt et al., 2016). Naidu and Prose (2018) stated

researchers use member checking to verify the participant responses are accurate and allow the participant to share further data that may arise from the process. I emailed the participants the transcribed summaries for member checking and scheduled a 30-minute call to discuss the summary for the participant's reflection on the interview's accuracy.

## Data Organization Techniques

Qualitative researchers require multiple organizational methods when collecting data during a case study (Williams & Moser, 2019; Yin, 2018). My organizational procedures included journal notes, recording, transcription of the interview, and a computer-assisted qualitative data analysis software (CAQDAS) of NVivo ® to organize data to discover themes. When conducting the interviews, I used journaling to capture notes and relevant information from any observations made by the participants. The journal included pertinent information related to the interview date, the participant's title, job functions, and name (Annink, 2017; Phillippi & Lauderdale, 2018). The participants' protection occurred by labeling each participant with L1, L2, or L3 to conform to the IRB process's ethical confidentiality. Researchers adhere to the participants' ethical protection by creating codes to mask their identity (Lancaster, 2017). Additionally, each interview was captured on a digital recording device to ensure accuracy and aid in creating transcription summaries for future member checking with each participant. Qualitative researchers may use available software to aid in the accurate documentation of the data and organization of the data for analyses (Williams & Moser, 2019). I used Microsoft Word ® to document each interview's transcription and organized it into files according to each participant's name. After the interview transcriptions occurred, I used NVivo ®

software to manage the data by coding to recognize themes. Researchers use a CAQDAS to catalog, organize, and code data for better analyses using digital means (Dalkin et al., 2020; Saunders et al., 2015; Yin, 2018).

I protected the confidentiality of each participant by locking physical data in a fireproof safe.  Researchers require an ethical responsibility to protect the participants' data and ensure the destruction of the data after a specific time (Charlesworth, 2012; Yin, 2018). Participant confidentiality is of great concern for investigators, and securing any data collected ensures appropriate ethical measures (Lancaster, 2017). Additionally, I secured any digital data by password on a flash drive and stored it in the designated fireproof safe. Furthermore, all collected raw data is stored securely for five years in a locked fireproof safe located in my home office and destroyed after the five years are over.

## Data Analysis

Data analysis for my study occurred from information collected concerning the sustainment of CI projects by supply chain leadership by interviewing, observing, member checking, and reviewing archival documents. Researchers achieve data saturation when reoccurring themes or patterns emerge, and the discovery of new data does not occur (Guest et al., 2020). Qualitative researchers may use many data analysis types to explore repeating themes (Scharp & Sanders, 2019). To address the research question for my study, I analyzed the themes and emerging patterns to develop existing relationships (Scharp & Sanders, 2019; Yin, 2018).

I used methodological triangulation to collect data from interviews, documents, and member checking to establish validity. Farquhar et al. (2020) stated triangulation to analyze multiple data sources increases credibility and validity. Researchers seek data triangulation from varying data collection points, such as interviewing and archival documents (Abdalla et al., 2018; Joslin & Müller, 2016). Case study researchers primarily use methodological triangulation to analyze many data types to apply to a phenomenon (Heesen et al., 2019). To achieve methodological triangulation, I conducted face-to-face or virtual interviews and reviewed archival documents to collect data from multiple analysis points. Additionally, after each interview transcriptions, summaries provided to each participant may offer additional insight into observations using the member checking process. The use of methodological triangulation may provide researchers with validity in the data analysis process by exploring identifiable themes from interviews, journal notes, or documentation (Abdalla et al., 2018; Saunders et al., 2015). I used methodological triangulation to discover themes of data gathered from interviews, member checking, and archival documents related to the sustainment of CI programs.

Researchers use coding to classify words and phrases collected for future data analysis (Parameswaran et al., 2020; Williams & Moser, 2019). Skjott Linneberg and Korsgaard (2019) suggested coding is a method to analyze participants' responses into categorical themes for analysis. The use of coding allows investigators to recognize parallel or opposing themes from participant responses (Maher et al., 2018). After each interview, I transcribed the recorded responses into Microsoft Word ® table according to

each participant. Then, I identified and highlighted commonalities by the color that arose

from each respondent to recognize themes related to the central research question.

Maintaining the participant's raw data integrity is crucial for validity (Belotto, 2018;

Saunders et al., 2015). Using the raw data, I implemented coding by grouping each

transcription highlighted response by parallel ideas related to the conceptual framework.

Various techniques for organizing the analysis of participant data exist; however,

ensuring the data's original nature is the researcher's greatest concern (Yin, 2018).

Researchers use thematic analysis to discover how the collected data may relate to

the central research question (Belotto, 2018). I used a CAQDAS to organize the

transcribed data and assist with coding to recognize themes related to my research

question. The use of NVivo ® allowed me to organize and catalog the participant

responses for the emergence of themes or patterns. Many researchers suggested the

positive use of a CAQDAS to aid in coding and recognizing themes in data analysis

(Maher et al., 2018; Parameswaran et al., 2020; Yin, 2018). Swygart-Hogaugh (2019)

prescribed the use of NVivo ® for case study researchers to analyze raw participant data.

Participant interview transcriptions may provide codes related to a research question and

benefit from analysis using a CAQDAS for thematic discovery (Freitas et al., 2017). I

used the latest version of NVivo ® 12 to organize participant transactions, code, and

identify themes. Researchers identify themes from the participant raw data collected

using the organization and utilize a CAQDAS for analysis (Maher et al., 2018). To

achieve thematic saturation, I uploaded the interview recording for transcription analysis

into NVivo ® to uncover themes related to my research question.

For additional data triangulation, I reviewed archival documents related to the CI sustainment of a project. The documents requested included the project FMEA and the project charter to understand CI success. Researchers using methodological triangulation use various data sources to achieve saturation (Farquhar et al., 2020). Qualitative researchers review multiple data points beyond participant interviews to explore the greater context for theme identification (Abdalla et al., 2018). Archival document analysis may provide researchers with additional insight into the organization from a different perspective to validate participant data (Yin, 2018). The use of archival documents provided my study with insight into the sustainment of CI programs and theme analysis of collected data.

Researchers organize and reflect on the literature's key themes and the specific research lens selected for a study (Meadows & Wimpenny, 2017; Yin, 2018). My studies' conceptual framework focused on using TQM principles to sustain CI projects in supply chain organizations. The use of TQM may aid supply chain leaders in maintaining CI programs by engaging employees and leadership supporting projects (Sreedharan et al., 2018). During the writing of section three, I reflected on any new and relevant literature published since the initial creation of my literature review and conceptual framework. The identified themes reflect new research conducted specifically to TQM for the conceptual framework as a lens to interpret themes.

## Reliability and Validity

For my study, I ensured consistent results occurred by creating trustworthiness with reliable and valid research. Reliability refers to the repeatability and consistent

nature of the research, while validity relates to the accuracy and the proper method selection used by the researcher (Saunders et al., 2015). Qualitative researchers desire to establish rigor in academic research by establishing trustworthiness to enhance consistency in the data's quality (Stewart et al., 2017). To establish trustworthiness in research, investigators require the establishment of credibility, transferability, dependability, and confirmability (Maher et al., 2018).

**Reliability**

Researchers ensure quality by collecting data to allow for repeatable results by other investigators (Cypress, 2017). Collingridge and Gantt (2019) stated that reliability refers to replicating data to establish rigor in the quality of research. Researchers test data for authenticity to determine trustworthiness from various perspectives (Vakili & Jahangiri, 2018). The research's reproduction requires similarity in recreating repeatable data for reliability (Yin, 2018). I ensured reliability in my study by drawing from multiple sources of evidence for interviews and archival document analysis.

*Member Checking for Dependability*

Dependability refers to the level of consistency and stability concerning the repeatability of the studies' data and contextual setting (Ellis, 2019). The establishment of dependability may include an audit trail of detailed note-taking, management of the data, and consistency in the research process (Korstjens & Moser, 2018). Yin (2018) noted researchers seek dependability for others to recreate research from the intended study. I used summarized responses and shared them with the participants to use member checking for dependability insurance.

Member checking may aid a researcher by allowing the review of responses and aid in interpretation for identifying themes (Naidu & Prose, 2018). Researchers use member checking to ensure the participant's correct intent occurs in the research process (Korstjens & Moser, 2018). Furthermore, qualitative researchers may use member checking to gain new insight into the collected data and capture reflections from participants post-interview (Birt et al., 2016; Caretta & Perez, 2019). I intended to use member checking for reliability and dependability sent summarized responses from the participant's interview for the review in under 30 minutes to depict the captured interviews accurately.

**Validity**

Researchers obtain validity in a study by ensuring credibility, transferability, confirmability, and data saturation (Cypress, 2017; Yin, 2018). Cypress (2017) stated that validity is the measure of accuracy in the findings of a study. Researchers establish trust in a study using validity by accurately reflecting the intangible elements of responses and using effective interviewing protocols (Collingridge & Gantt, 2019). Vakili et al. (2018) noted that validity refers to the accuracy of the methods used in interpreting the outcome of a conducted study. To develop validity in my study, I used methodological triangulation to explore data collected from face-to-face or virtual interviews with participants and physical document analysis.

*Credibility*

Researchers using the case study design ensure credibility occurs in a study by analyzing themes that occur from the use of semistructured interviews (Abdalla et al.,

2018). Cypress (2017) suggested researchers establish credibility from the accurate representation of the participants' data. One method researchers may use to establish credibility is member checking, as the researcher reviews the interview transcriptions with a participant to reflect accuracy (Liao & Hitchcock, 2018). During the member checking process, participants may provide further insights into the initial interview responses and ensure an additional means of data triangulation occurs (Birt et al., 2016). I used member checking to ensure credibility in my study by carefully examining each participant's responses to ensure I correctly captured the participant's intended response to the semistructured interview questions.

*Transferability*

Transferability refers to the concept of applying the results of a qualitative study to other studies with similar situations or settings (Cypress, 2017; Yin, 2018). Abdalla et al. (2018) suggested researchers create transferability by ensuring a possibility exists for a different research setting using new participants and new data. The researcher may establish data integrity and transferability by accurately documenting the data collection process with valid descriptions of the participant's responses (Collingridge & Gantt, 2019). To ensure the transferability of my study, I accurately recorded the data collection techniques and the methodology to establish accuracy and validity. Additionally, I used member checking during the semistructured interview process with detailed documentation for the occurrence of transferability in my study.

*Confirmability*

Researchers seek to achieve confirmability by establishing the means for other investigators to verify the data for confirmation (Chung et al., 2020). Haven and Van Grootel (2019) suggested confirmability is the method of maintaining the researcher's objectivity during the presentation of the study findings. Confirmability also refers to the researcher avoided bias by accurately depicting the participant responses for valid interpretation (Rose & Johnson, 2020). I ensured confirmability during the member checking process by allowing the participant to review a summary of the interview to reflect on the accurate collection of unbiased results. I also ensured confirmability by documenting and following the data collection procedures and aligning with my study's purpose.

### Data Saturation

I collected data from the participants and the organizational archival documents until I achieved data saturation in my study using methodological triangulation. Methodological triangulation refers to the researcher's use of multiple means to gather data to understand a phenomenon related to the study (Abdalla et al., 2018). Researchers achieve data saturation during the qualitative process when themes continue to reoccur and new themes no longer emerge (Farquhar et al., 2020; Haven & Van Grootel, 2019). Guest et al. (2020) noted definitive findings would not occur until data saturation to the point of repetition. I used methodological triangulation to explore multiple data points from participant interviews, member checking, and document analysis to increase my study's validity. I collected data until repetitiveness and the exhaustion of thematic analysis occurred.

**Transition and Summary**

In section 2 of my study, I provided the purpose of the study, the role of the researcher, the participants, and the researcher's method and design. Additionally, I addressed the areas of population and sampling, ethical research, data collection instruments, data collection techniques, and data analysis. I followed with the reliability and validity portion and completed a summary and transition for the section. In section 3, I provided the study's (a) presentation of the findings, (b) application to the professional practice, (c) the implications for social change, and (d) the recommendation for action and future research. Furthermore, I addressed the reflections of my research and the conclusion of my study.

Section 3: Application to Professional Practice and Implications for Change

**Introduction**

The purpose of this qualitative single case study was to explore strategies that supply chain leaders use to implement and sustain successful CI initiatives beyond the 1st year. I interviewed six participants in the Midwest region of the United States with experience in successful CI project initiatives. The participants were supply chain leaders with over 3 years of CI experience with the title of manager or senior manager. I also collected physical documents for data triangulation from participants for control or FMEA to mitigate failure risk. I analyzed the data using NVivo 12 ®. The four themes that emerged from the data triangulation for strategies to sustain CI initiatives were (a) leadership engagement, (b) employee engagement, (c) standardization, and (d) training. First, all six participants agreed that leadership engagement is necessary for the success of CI initiatives. Second, all six participants suggested that employee engagement contributed to successful CI programs. Third, all six participants described the use of standardization across the facility and network for sustainable CI programs. Finally, six participants attributed training in CI methodology as key for successful CI initiatives.

**Presentation of the Findings**

The central research question for this study was: *What strategies do supply chain leaders use to sustain CI initiatives beyond the 1st year?* I used semistructured interviews with open-ended questions (Appendix A) and physical documents of FMEA and project charters obtained from participants to assist in data triangulation. I compiled the findings and analyzed the data using NVivo 12 ®. The four emergent themes that occurred from

the data were (a) leadership engagement in the entire CI process, (b) employee engagement as means to sustain and promote CI initiatives, (c) standardization in CI practices across the network and facilities, and (d) training of leaders and employees in CI methods. I used frequency tables, numbered 1 through 4, to show the participant's frequency of responses to the interview questions. I designated the participants with the coded alphanumeric numbering of L1, L2, L3, L4, L5, and L6.

**Theme 1: Leadership Engagement**

Leaders engaged in the CI process may contribute directly to the sustainment of successful CI strategies in an organization. Jevanesan et al. (2021) proposed the successful adoption of CI by an organization includes leadership buy-in and investment in the initiatives. As stakeholders in the organization, leaders may fail to understand the specific process requirements and are essential for the success of a process (Jevanesan et al., 2021). Graham and Woodhead (2021) noted an increased response of stakeholder engagement and the relation of the rapid success of CI programs during the COVID-19 outbreak in the healthcare sector. Organizations that provide empowered leadership and committed leadership create an environment where CI initiatives face greater success (Van Assen, 2020). Leaders may contribute directly to the strategies for the successful implementation of a CI initiative. All six (100%) participants stated that leadership engagement is critical as a tool to implement and sustain a CI initiative successfully. Table 1 shows the frequency of participants' responses to Questions 1, 2, 3, 4, 5, 6, and 7. Table 1 demonstrates that 31 references exist from the participant responses concerning leadership engagement toward the success of a CI project.

**Table 1**

*Leadership Engagement in CI Sustainment (Frequency)*

| Participant | Interview questions | Total number of references |
|:---:|:---:|:---:|
| L1 | 1,3,4 | 7 |
| L2 | 1,2,5,6,7 | 11 |
| L3 | 2,6,7 | 4 |
| L4 | 6,7 | 3 |
| L5 | 4,7 | 2 |
| L6 | 1,3,6 | 4 |

Regarding the application of engaged leaders as a strategy to sustain CI initiatives, the first interview question was: What strategies did you use to sustain your organization's CI initiatives beyond the 1st year? The purpose of this question was to assist in discovering specific strategies leaders may use to sustain CI initiatives. Two (33%) participants noted using Gemba walks by leadership to walk work areas and ask employees working in the areas specific questions to remove barriers for CI initiatives. Alnajem (2021) described Gemba as a subset of lean methodology where project teams or leaders physically visit the specific work site to see the process in action. Traditionally, leaders used Gemba walks to engage employees in the specific work area and observe the process (Alnajem, 2021). Participant L1 noted that the leadership conducts weekly Gemba walks to speak with employees on specific workplace barriers and then meets as a senior leadership team to discuss action plans. L1 continued, "We actually have

associates fill out the Gemba board, then as a senior group, we go around, and then they actually present it to us." Additionally, participant L6 noted the use of "weekly meetings, as a department that we discuss a lot of our processes, especially newer processes." Finally, participant L6 described the use of assigned ownership of each aspect of an initiative for follow-up for continued sustainment.

Participant L2 described the leadership practice of making a CI initiative a "line item on management quarterly and annual appraisals." Further discussion from L2 suggested that the focus of an evaluation line item drives the leadership engagement by making a focus on CI initiative a measurable value to the organization. Participant L2 noted the focus of CI in the network organization by assigning a specific CI implementation manager that reports directly to the site director. Participants L2 and L6 further argued for mandatory leadership CI-focused meetings to guide the CI culture and promote training for leadership in CI methods. Participant L6 discussed quarterly follow-up meetings to discuss.

Question 2 and Theme 1 demonstrated a relationship between participant responses and strategies leaders might use to sustain CI projects: What role has the company's leadership played in developing strategies to sustain CI initiatives for longer than 1 year? The research intent behind Question 2 was to discover how organizational leadership participated in developing strategies for CI sustainment. Two (33%) participants indicated that leadership engagement in CI development is critical for the success of organizational culture based upon CI methodology. Participant L2 argued that "it's absolutely critical to have those improvements are going to come from a top-down

perspective." Furthermore, participant L2 noted that CI occurs from leadership to the "grassroots" employee levels. Specific failure, L2 observed, related to the lack of leadership discussion about CI in meeting context.

Participant L3 related to Question 2 using Gemba walks by leadership at the employee level. L3 noted that the facility completes a Gemba walk weekly and in every department in the facility. Additionally, participant L3 described using a visual Gemba board for leaders to track progress and create follow up with employees in all areas of the facility. Participant L2 described leadership engagement: "I've seen successful programs where they start talking about its meetings, they start using some of the jargon in the language of CI, everyone else will start talking the same way."

Two (33%) participants responded to Question 3 about implementing strategies to sustain CI using leadership engagement. Question 3 asked: How did you implement employee engagement as a strategy for sustaining CI initiatives beyond the 1st year? My intent behind question number three concerning Theme 1 was to discover how leadership engagement interacts with creating employee engagement to sustain CI programs. Participant L1 noted that employees meet specifically with senior-level leadership of the facility to "talk through pretty much everything in terms of process improvement, engagement, just how they're feeling in the building, just the overall employee experience." Participant L1 further elaborated that specific leadership in the engagement meeting included the facility director, leadership, and human resources manager. Participant L6 noted, "We've gotten the buy-in is just communication to the broader scope of the team, making sure everybody knows that we're making some changes or

improvements, why we're doing it, what the goal is, and what the expected outcome is."

Participant L6 continued with requesting continuous feedback on the state of the process

from employees and leadership to adjust as needed.

Two (33%) participants responded to Question 4 specific to training provided to

leadership for CI methodology to benefit from leadership engagement. Question 4 asked:

What training does the organization provide leaders in CI methods and strategies for the

sustainability of CI initiatives beyond 1 year? The intent of Question 4 was to discover

the relationship to training in CI methods provided to leaders as a potential strategy to

sustain CI initiatives. Participant L1 described the leadership engagement resulting from

training as continually progressive meetings for leadership to meet and discuss specific

actions for process improvements. Participant L1 indicated that leadership remained

engaged by constant interaction with the CI process. Additionally, participant L5 noted

the facility's lack of formalized CI methodology training and continual CI terminology in

daily workflow. L5 described: "The Gemba process gives everybody or all the leaders an

opportunity to identify barriers in their area and find quick projects to execute and

continue to refine."

One (16%) participant responded to Question 5 about leadership engagement.

Question 5 was: What training does the organization provide employees in CI methods

and strategies for the sustainability of CI initiatives beyond 1 year? The intent behind

Question 5 was to discover the relationship of training in CI methodology the

organization provided to the employees. Theme 1 may relate to Question 5 by

discovering how leadership engagement impacts the level of training that employees may

receive in CI methods. Participant L2 noted that employees "become accustomed to hearing CI from their leaders." Participant L2 further stated that "we do that at weekly meetings, monthly meetings, or even quarterly meetings, where we go over some of the quarterly results with your associate population." Furthermore, L2 described CI topics and language by leadership in everyday work language to train the employees in CI methods. Additionally, L2 argued for the development of a connection of CI strategies with the employees.

Four (66%) participants related to Question 6 that control and policy deployment relate to leadership engagement as a strategy to sustain CI initiatives. Question 6 was: How, if at all, did you implement policy deployment and control strategies for the sustainment of your organization's CI initiatives beyond the 1st year? My intent behind Question 6 was to discover what relationship policy deployment and control processes may play in sustaining CI programs. Participant L2 noted that a control process leadership used CI as a specific item for evaluation and appraisals. L2 continued that leadership remained engaged by managing a specific number of required Kaizen projects each year.

Additionally, L2 discussed the value of the Gemba process to follow up with the project and continually adjust as needed for sustainment. Finally, participants L2 and L4 indicated the specific use of Gantt charts to control and track CI initiatives. For example, in leadership tracking, L2 commented, "We track that via Gantt charts, a standardized Gantt chart that you know, is in a common location that people can access to see those updates every single week."

Participant L3 noted the development of leadership positions in the network facilities to implant and control CI initiatives. L3 continued that the leadership positions report outside the facilities and directly to the network to create CI control. Participant L4 noted the importance of planning a project and used CI and process improvement terminology interchangeably during the interview. Participant L4 described a control procedure of weekly follow-up meetings where stakeholders from all employee levels are involved in tracking progress. Participant L4 noted, "If there are any hurdles, or anything preventing us to continue to project, those hurdles are removed."

Additionally, L4 stated, "Those meetings go on, even when the process is done until there's really no more meeting notes, and all the hurdles are done." Finally, participant L6 described the organizational use of "measuring the results of whatever that process improvement is or continuous improvement to see if it's the expected outcome."

Four (66%) participants responded to Question 7 concerning Theme 1 for leadership engagement in sustaining CI initiatives. Question 7 stated: What more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year? My intent behind Question 7 was to discover any additional information related to specific strategies for sustaining CI projects. Participant L2 noted that leadership engagement occurs when "senior leaders just need to really talk about it, buy into it, once they start talking about it, that's when it catches fire below." Participants L2 and L3 discussed that the level of engagement from top-down determines the level of engagement from the employee level up to leadership. L2 further iterated that employee engagement is critical as a measure for the successful indication of the health of a

leadership engagement in CI programs. Participant L3 continued in leadership

engagement with employees to "create a better culture, make their jobs easier, and make

them like their jobs more."

Participant L4 described the use of formation of project teams where each

member contains the power to make decisions to impact the entire process or facility. L4

noted the use of decision-makers as stakeholders to remove barriers in a CI initiative. L4

argued that decision level stakeholders combined a weekly process meeting greatly

expedited project success due to faster timelines and not awaiting approval with

communication. Participant L4 stated, "We can get things done a lot faster, and we don't

have to wait for a team of communication to get back to make another decision the next

week, where decisions can be made within a week, and we can all move forward on the

project."

Furthermore, participant L5 noted that leadership engagement drives the

excitement for CI programs and the sustainment of projects in a facility. L5 stated that the

leadership and employee level engagement is heightened when they "get excited about

potential barriers and trying to remove them and create these projects." L5 argued that

projects might fail due to a lack of consistency in follow-up. Participant L5 described a

strategy to prevent CI project failure by using a specific "standard work" document to

define all aspects of the process. L5 stated, "Having a routine and having a strong

organization to circle back on processes and projects is key, or else I will not get those

done." Additionally, L5 noted "very strict organization and very strict routines to circle

back and make sure processes are still in control and if they're not giving them back in control."

### *Physical Document Analysis*

I reviewed the organizational documents (Appendix C) of the FMEA and control plan used during and after a CI initiative to sustain a project. My analysis of the physical documents revealed a relationship between Theme 1 for leadership engagement specifically related to the control plan. All six (100%) participants referred to necessary means to follow up on CI processes and assign responsibility for completing tasks among leadership teams. All (100%) participants referred to the FMEA in some form to strategic planning and recommended actions at the facility or network level to sustain a CI implementation.

### Theme 2: Employee Engagement

Employee engagement may provide organizations with the means to develop strategies for the success of CI initiatives. Joo et al. (2021) suggested that employees that receive empowerment from the organization are most likely to demonstrate higher engagement levels. Leaders may motivate employees to participate in projects by creating environments where decision-making and innovation may occur at the employee level (Van Assen, 2020). Van Assen (2021) asserted that employees that receive CI methodology training typically exert greater engagement in the CI program for the organization. Table 2 shows participants' L1, L2, L3, L4, L5, and L6 responses for questions 1, 2, 3, 4, 5, 6, and 7 concerning employee engagement as a strategy for the success of CI implementation and sustainment. Table 2 further acknowledges the 24

references made by the participants for the effectiveness of employee engagement in CI

programs.

**Table 2**

*Employee Engagement in CI Sustainment (Frequency)*

| Participant | Interview questions | Total number of references |
|---|---|---|
| L1 | 1,3,4, | 5 |
| L2 | 2,3,6,7 | 5 |
| L3 | 1,3 | 5 |
| L4 | 3,5,6 | 3 |
| L5 | 3,5 | 2 |
| L6 | 3,6 | 4 |

Regarding the application of engaged employees as a strategy to sustain CI

initiatives, interview Question 1 states: What strategies did you use to sustain your

organization's continuous improvement (CI) initiatives beyond the first year? The

researcher's purpose of this question was to assist in discovering specific strategies

leaders may use to sustain CI initiatives using employee engagement. Two (33%)

participants noted the use of a physical location in the facility where employees can

submit ideas for CI using electronic means for leadership review. L1 described the

continued use of the Gemba process to engage employees directly and allow direct

feedback from the employee level up to leadership. L3 suggested that "After the first year

was really associate driven, and then completed by the manager." L3 followed up with

the feedback process being employee-driven, where ideas for the CI process directly flowed from bottom to upper levels.

Question 2 and Theme 2 demonstrated a relationship between employee engagement and strategies leaders might use to sustain CI projects: what role has the company's leadership played in developing strategies to sustain CI initiatives for longer than one year? One (16%) participant indicated that leadership engagement in CI development is critical for the success of organizational culture based upon CI methodology. Participant L2 commented about CI initiatives, "the ones I've been involved with that were successful, were actually grassroots-driven." Leadership that embraced employee engagement may see higher outcomes of CI project success by enacting an employee-driven culture.

Six (100%) participants responded to Question 3 regarding Theme 2 that employee engagement was essential for a successful CI project sustainment. Interview Question 3 stated, how did you implement employee engagement as a strategy for sustaining CI initiatives beyond the first year? Participant responses supported the requirement of engaged employees as an indicator for CI sustainment and success. Participants L1 and L3 described a monthly senior leadership meeting with employees voluntarily to listen to employee feedback for barriers related to work areas to generate CI project ideas. Participant L1 additionally described the organizational use of an incentive program across the network "makes pitches an idea, and it becomes like a network change. Like there's some type of monetary gain if that process gets implemented."

Participants L2, L3, and L5 noted the specific benefit of Gemba walks by leadership to interact with employees in work areas and allow employees to identify areas to improve daily workflow. L2 asserted, "we did was we've added associates to every just about every improvement event or waste walk, or Gemba walk that we've done." Employee engagement, participant L2 argued, requires the leadership inclusion of employees in Kaizen events and open communication to listen for improvement ideas. Additionally, participants L2 and L3 noted the common CI practice of employees as included in Kaizen events to promote engagement and training of employees in CI methodology. L2 suggested that culture benefits from employee engagement by "to really make them feel important that they're part of this improvement event."

Furthermore, participants L4 and L6 noted the specific use of open communication during the CI process. Both participants noted employee inclusion at all levels of the process for buy-in and adaption of training in CI methods. Participant L4 described the specific use of assigning each employee involved in the CI process an action item to complete to increase engagement further. Participant L6 included using employee meetings, surveys, and seeking input while implementing a CI process as essential before making any process changes that may affect the successful outcome.

One (16%) participant responded to Theme 2, concerning Question 4, describing training that leadership may receive in CI methods. Question 4 stated, what training does the organization provide leaders in CI methods and strategies for the sustainability of CI initiatives beyond one year? The researcher's intention for question four related to Theme 2 was the use of CI training for leadership to obtain employee engagement as a strategy

to sustain CI initiatives. Participant L4 noted the formation of subject matter teams with both area leaders and employees meeting weekly and monthly to promote engagement. Participant L4 continued, ideas from the subject matter team contribute to CI initiatives strategies.

Two (33%) participants responded to Question 5 about employee engagement concerning Theme 2. Question 5 was: what training does the organization provide employees in CI methods and strategies for the sustainability of CI initiatives beyond one year? The intent behind the use of question five was to discover the relationship of training in CI methodology the organization provided to the employees. Theme 2 may relate to Question 5 by discovering how employee engagement impacts the level of training that employees may receive in CI methods. Participants L4 and L5 acknowledged that employees receive training for CI methods using on-the-job training from participation in Kaizen events or Gemba walks. Participant L5 noted that "encouraging associates to, to identify those and to communicate them, and then have them communicate at our presentations, that way we can address them, and get them knocked out as quickly as possible and continue to get better as an organization." L4 described that employee training is not a formalized process from the organization, but training occurs from the Kaizen team leader on an individual basis.

Three (50%) participants responded to Question 6 that control and policy deployment relates to employee engagement as a strategy to sustain CI initiatives. Question 6 was: how, if at all, did you implement policy deployment and control strategies for the sustainment of your organization's CI initiatives beyond the first year?

The researcher's intent behind question 6 was to discover what relationship policy deployment and control processes may contribute to the success of CI programs. Participants L2, L4, and L6 described the importance of following up with the employees at all stages and the continual follow-up after project completion to ensure a control phase occurred. Participant L2 stated, "checking in to make sure that those initiatives are being followed, that people are doing, really what they need to do, but also kind of just managing that process, but engaging those leaders in that process." Participant L4 advocated for the importance of project planning, use of Gantt charting, and weekly project meetings with all stakeholders. Furthermore, participant L6 described the critical importance of follow-up after completing the process by discussing barriers or success directly with the employees working in the project area. All participants noted the engagement after project completion was critical in sustaining a process by listening to the area subject matter experts.

One (16%) participant responded to Question 7 concerning Theme 2 for leadership engagement in sustaining CI initiatives. Question 7 stated: what more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year? The researcher's intent behind question seven was to discover any additional information related to specific strategies for sustaining CI projects related to the second theme. Participant L2 noted that non-engaged employees typically relate to a non-engaged CI program as an indication of CI culture in an organization. Additionally, participant L2 discussed the need for employee engagement to generate excitement for future CI projects that encourage other employees to engage and share ideas for

improvement. Furthermore, L2 indicated the importance of including employees in CI training using Kaizen or Gemba to promote engagement.

**Theme 3: Standardization**

Supply chain leaders may benefit from standardization among facilities and networks as a strategy to sustain CI initiatives. Tsvetkova (2020) suggested using standardized processes across a network may improve replication of strategy from one location to another in the organization. Organizations that use standardized methods for projects may see higher implementation success rates when using TQM methods for CI programs (Constantinescu, 2020). Additionally, Constantinescu (2020) noted the positive effects standardization of production processes might have on increased efficiency and quality. Participants L1, L2, L3, L4, L5, and L6 described standardization for the effects on sustainable CI programs in response to the interview questions 1, 2, 3, 4, 5, 6, and 7 noted in Table 3. Furthermore, the participants mentioned 19 references to standardization in Table 3.

**Table 3**

*Standardization in CI Sustainment (Frequency)*

| Participant | Interview questions | Total number of references |
| :---: | :---: | :---: |
| L1 | 2,6,7 | 10 |
| L2 | 1 | 1 |
| L3 | 6 | 2 |
| L4 | 1 | 1 |
| L5 | 1,2 | 4 |

| L6 | 1 | 1 |
|---|---|---|

Regarding the application of engaged leaders as a strategy to sustain CI initiatives, the first interview question was: What strategies did you use to sustain your organization's continuous improvement (CI) initiatives beyond the first year? The purpose of this question was to assist in discovering specific strategies leaders may use to sustain CI initiatives. Four (66%) participants addressed the specific question by relating the use of standardization across a network and facility as a strategy for the sustainment of CI initiatives. Participant L2 noted the use of kaizen events at each location in the network to implement CI culture and training. Subject matter expert training, participant L4 described as essential to pass CI knowledge from operations to supervisors.

Additionally, participant L5 suggested the use of standard works as a means to standardize across management functions in the facility. L5 further noted the standard works as use for following through with the CI process. However, participant L6 commented that "It's not really standardized. Outside of the building, everybody kind of has their own way." Standardization may provide leaders with the means to sustain CI initiatives. However, the response from participants indicates some processes are standardized, and others may not use standard practices.

Question 2 and Theme 3 demonstrated a relationship between participant responses and strategies leaders might use to sustain CI projects: what role has the company's leadership played in developing strategies to sustain CI initiatives for longer than one year? The research intent behind Question 2 was to discover how organizational

leadership participated in standardization for developing strategies for CI sustainment.

Two (33%) participants indicated the use of standardization as a method to sustain CI

initiatives. Participant L1 described the requirement for CI projects to allow for

replication across the network for all facilities. L1 continued that expert teams travel to

each location in a network to standardize processes and implement standard works

documentation for each facility.

Furthermore, L1 noted the use of quarterly meetings where leadership verifies

standard works procedures. Additionally, L1 commented that a CI manager is assigned in

each location in the network to aid in the standardization of processes. Participant L5

noted the use of standard works to ensure teams function at the same levels of efficiency

during a CI process change. L5 described digital means to document and allow for

standardized sharing across the network to ease adjustment and follow through.

Two (33%) participants related to Question 6 that control and policy deployment

relate to standardization as a strategy to sustain CI initiatives. Question 6 was: how, if at

all, did you implement policy deployment and control strategies for the sustainment of

your organization's CI initiatives beyond the first year? The researcher's intent behind

Question 6 was to discover what relationship policy deployment and control processes

may play in sustaining CI programs. Participant L1 described a trial process for a CI

initiative for a specific shift to ensure success before rolling out to all shifts in the facility

and further in the network. L1 continued that updating standardized signage across a

work area was essential for success and occurred immediately after a change occurs.

Furthermore, the CI team updates training documentation, and any digitalized standard

works with a greater organizational network. Participant L3 noted the organizational creation of the best method for all processes that leadership distributes to all facilities for standardization in standard works documentation.

One (66%) participant responded to Question 7 concerning Theme3 for standardization in sustaining CI initiatives. Question 7 stated: what more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year? The researcher's intent behind Question 7 was to discover any additional information related to specific strategies for sustaining CI projects. Participant L1 noted that processes should be similar from one location to another so that any employee may travel to another location and complete the prescribed processes with minimal learning effort. Participant L1 described standardized processes using standard works at each facility to create similar success rates when implementing CI initiatives.

*Physical Document Analysis*

My analysis of the physical documents (Appendix C) revealed that standardization, as represented in Theme 3, related to both the control plan and the FMEA to sustain a CI initiative. Four (66%) participants advocated for failure mitigation during the CI process related to the FMEA. The participants specifically mentioned using an FMEA as a tool for CI methodology to create standardized processes across the network. All (100%) participants referred to a control plan throughout the data collection process to standardize CI practices across the organization for CI sustainment.

**Theme 4: Training**

Training in CI methods may provide organizations with specific strategies for successful CI sustainment. Van Assen (2021) argued that training in both the commonly used CI method and a broader understanding of the CI techniques result in successful programs in an organization. Organizations that benefit from CI use may contain a formalized training program in CI methodologies (Paipa-Galeano et al., 2020). Faciane et al. (2021) discussed the value of training employees for quality improvements necessary for successful adoption and the foundation of a culture change. The training provided by the organization to employees and leaders is shown in Table 4 by participants L1, L2, L3, L4, L5, and L6 in response to questions 1, 2, 3, 4, 5, 6, and 7. Table 4 demonstrates the 27 references made by the participants concerning the training involved in successful CI initiatives.

**Table 4**

*Training in CI Sustainment (Frequency)*

| Participant | Interview questions | Total number of references |
|:---:|:---:|:---:|
| L1 | 4,5 | 4 |
| L2 | 1,3,4,5,6,7 | 8 |
| L3 | 4,5,6,7 | 4 |
| L4 | 1,2,4 | 3 |
| L5 | 4 | 1 |
| L6 | 2,4,5,7 | 7 |

Regarding the application of training in CI methodology as a strategy to sustain CI initiatives, interview Question 1 states: What strategies did you use to sustain your organization's continuous improvement (CI) initiatives beyond the first year? The researcher's purpose of this question was to assist in discovering specific strategies leaders may use to sustain CI initiatives with the use of training. Two (33%) participants specifically noted the use of CI subject matter experts to train leadership and employees in CI methods. Participant L2 described Kaizen events and using the working employee from the designated project area as included in the CI project. Both participants L2 and L4 continued that the CI leader trains others in the facility by inclusion in CI tasks or processes. Participant L4 communicated, "So it was designed for me to train the operators or the supervisors on how it works so that they can become the subject matter experts and maintain the performance management system."

Question 2 and Theme 4 demonstrated a relationship between training and strategies leaders might use to sustain CI projects: what role has the company's leadership played in developing strategies to sustain CI initiatives for longer than one year? Two (33%) participants, L4 and L6, noted training a potential strategy leader might use to sustain CI initiatives. Participant L4 commented that the leadership hosted week-long training sessions for facility leaders, focusing specifically on process improvement. L4 continued, outside CI subject matter experts were brought into the facility to instruct CI principles and methodologies. Additionally, L4 noted a yearly CI conference between all the network CI leaders to calibrate CI practices and training for the organization. However, participant L6 noted the lack of specific CI training at the organizational level

stating, "at a building level, we haven't had as much education, teaching, training going on." Participant L6 commented that the organization did not teach specific CI methods but used CI language in everyday practice for CI projects. Furthermore, L6 noted that green and black belt training existed from prior manager knowledge, but a specific level of taught CI methods was lacking.

One (16%) participant responded to Question 3, in relation to Theme 4, that training was essential for a successful CI project sustainment. Interview Question 3 stated, how did you implement employee engagement as a strategy for sustaining CI initiatives beyond the first year? Participant responses supported the requirement of engaged employees as an indicator for CI sustainment and success. Participant L3 noted the key to the successful adoption of a CI culture remains in the training of all employee levels in the organization. Participant L3 continued that the employees received training in CI methods during Kaizen events in basic methods so that CI standardization occurred in the facility.

Six (100%) participants responded to Theme 4, about Question 4, as describing training that leadership may receive in CI methods. Question 4 stated, what training does the organization provide leaders in CI methods and strategies for the sustainability of CI initiatives beyond one year? The researcher's intention for question four related to Theme 4 was the use of CI training for leadership as a strategy to sustain CI initiatives. Participant L1 noted the specific use of yellow and green belt courses for leadership and weekly online training modules offered in CI methods. Participant L2 noted that CI leadership at the facility level typically held either a green or black belt certification to

exhibit the required expertise in leading building-wide CI initiatives. Participant L2 commented that mid-level leaders required CI training up to a green belt level and supervisors to train in yellow belt level of LSS methods. L2 argued for all levels in the organization to train in some form of CI methods to develop a culture. Specifically, L2 noted the use of 5S, waste walks, and root cause analysis by all levels of leadership.

However, Participants L3, L5, and L6 noted that the organization no longer offers on-site training in LSS and CI methods but some online training. L3 and L5 continued that CI methods may arise from leaders with prior experience in the area, and training in CI occurs on-the-job training through Gemba walks. Participant L4 affirmed participant L3 responses by stating the organization lacked formalized CI training but was available online. Participant L6 argued that CI initiatives' success occurred with a lack of formalized training in CI as a CI culture developed in the organization.

Four (66%) participants responded to Question 5 about training in relation to Theme 4. Question 5 was: what training does the organization provide employees in CI methods and strategies for the sustainability of CI initiatives beyond one year? The intent behind the use of question five was to discover the relationship of training in CI methodology the organization provided to the employees. Theme 4 may relate to Question 5 by discovering how employee engagement impacts the level of training that employees may receive in CI methods. Participants L1, L3, and L6 noted a specific lack of formalized training for the employee level of the organization.

Additionally, L1, L3, and L6 argued for the success of CI initiatives using on-the-job training of CI methods through Gemba and Kaizen events. Participant L3 described

CI language built into the everyday workflow, and employees understand CI terminology for a CI initiative. However, participant L2 noted the inclusion of hourly supervisors in lean introductory methods in a formalized classroom training session.

Two (33%) participants responded to Question 6 that control and policy deployment relates to training as a strategy to sustain CI initiatives. Question 6 was: how, if at all, did you implement policy deployment and control strategies for the sustainment of your organization's CI initiatives beyond the first year? The researcher's intent behind question 6 was to discover what relationship policy deployment and control processes may contribute to the success of CI programs. Participant L2 and L3 both noted the success of continually updated training sessions for leaders and employees to keep CI methods fresh and discuss best practices that may affect CI sustainment. Participant L2 noted the yearly recertification of CI leadership in each facility and the inclusion of both leaders and employees in Kaizen events. Participant L3 described the use of training in standardized practices to develop CI methods to sustain projects' sustainment.

Three (50%) participants responded to Question 7 concerning Theme 4 for training in sustaining CI initiatives. Question 7 stated: what more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year? The researcher's intent behind question seven was to discover any additional information related to specific strategies for sustaining CI projects as related to Theme 4. Participant L2 noted the use of training to engage employees and develop a culture where ideas for improvements flow from bottom to upward. Participant L2 advocated for the specific use of Gemba, waste walks, and DMAIC as a method used by the organization to control the

process for sustainment. Participant L3 commented on the benefit of computer-based online training offered by the organization in CI methods that provides leadership with the means to learn CI skills. Participant L6 noted the facility use of Kaizen projects to teach leaders and employees CI methods in an on-the-job environment.

**Findings Related to the Conceptual framework**

Leaders of supply chain organizations may wish to use the concepts of TQM as a method to sustain CI initiatives. Deming (1986) prescribed the major tenants of TQM as (a) continuous improvement, (b) customer satisfaction, (c) information distributed in the network, (d) leadership commitment, and (e) policy deployment. Leaders may benefit from the use of TQM to improve quality and control operational costs in a network (Ćwiklicki, 2016). Leadership commitment and engagement are central tenants of TQM that bring CI value to organizational success (Sreedharan et al., 2018). Additionally, employee engagement is a critical component of TQM and CI directly related to a project's successful implementation (Sreedharan et al., 2018). Hoshin Kanri, or policy deployment, may aid leaders of supply chain organizations with methods to standardize and promote training practices for TQM and CI to sustain CI programs in a network (Tortorella et al., 2019). The conceptual framework of TQM directly relates to the findings of this study by affirming the positive results of (a) leadership engagement, (b) employee engagement, (c) standardization, and (d) training.

Leadership engagement emerged as a central theme of my study as strategy leaders may sustain CI initiatives. TQM concepts describe a direct relation to leadership engagement for successful CI cultural development in an organization (Lamine & Lakhal,

2018; Sreedharan et al., 2018). Georgiev and Ohtaki (2020) suggested the use of TQM directly benefits an organization when leaders are engaged in all processes of a change initiative. Leadership that uses TQM as a process for culture development may result in a positive outcome when change programs operate from a top-down perspective (Teoman & Ulengin, 2018). Four (66%) of participants described successful CI projects were supported and driven by organizational leadership.

Employee engagement related to the conceptual framework of TQM indicates a relation to the success of CI initiatives by actively engaging employees. Employee empowerment in the organization encourages other employees to participate in future change initiatives by creating greater involvement in CI projects (Prado-Prado et al., 2020). Sreedharan et al. (2018) described the positive benefit of involving the employee directly from a bottom-up approach to CI initiatives creates greater success rates. Additionally, the inclusion of employees in a CI initiative creates opportunities to train the employees in TQM and CI methods to develop a culture of TQM inclusion (Hsu, 2019). All (100%) participants discussed a direct relationship existing between the organization using employee engagement and successful results for CI initiatives.

The conceptual framework of TQM is directly related to the themes of standardization and training using the tenants of policy deployment and Hoshnin Kanri. Deming (1986) suggested that a major tenant for TQM is policy deployment. Leaders may cascade various phases of a project to communicate and control the process in a distributed network. Faciane et al. (2021) described a positive outcome for TQM methods when a consistent process rollout occurs across an organization. Organizations

implementing a culture related to CI control may see greater process improvement results

where efficiency may increase (Sutrisno & Ardyan, 2020). Four (66%) participants

agreed that standardization provided the organization with greater success means for

strategies to sustain CI initiatives. Additionally, all (100%) participants described the

successful outcome of training in CI methodology as a strategy to develop a culture

where TQM practices assist in production outcomes.

**Findings Related to the Current Literature**

Hamm Jr. and Wan (2021) argued the leaders of production-based organizations

might benefit directly from CI by increased efficiency and process improvements. CI

methods provide organizations with expertise in process improvement and cultural

change to assist leadership with achieving greater efficiency (Lee et al., 2021). Leaders

may receive specific training in levels of LSS as a green or black belt to develop CI

methods of sustaining success in projects created for various levels of the organization

(Arthur, 2021). CI skills that leaders may develop occurred in 5S, waste walks, DMAIC,

and quality controls (Chyon et al., 2020). Supply chain leaders may use the major

components of CI as (a) statistical quality control, (b) increased organizational longevity,

and (c) successful cost control (Unzueta et al., 2020). The major tenants of LSS prescribe

lean as people-focused methods to increase production and six sigma as means to

stabilize processes to decrease inconsistency (Chyon et al., 2020). The success of CI

initiatives is of importance to supply chain leaders as projects may frequently fail due to a

lack of leadership support in CI culture or process development (Kane, 2020). Supply

chain leaders lack strategies to sustain CI initiatives. They may receive benefits from

focusing directly on (a) leadership engagement, (b) employee engagement, (c) standardization, and (d) training in CI methods.

Regarding leadership engagement and CI, there is a direct link between the existing literature for the gravity of engaged leadership in CI success. Kane (2020) described the importance of leaders engaged in a CI process at all levels of the organization. Leadership that engages in the process provides support with higher positive outcomes by promoting a culture of change and adopting CI practices (Srimathi & Narashiman, 2021). All (100%) participants noted the inclusion of leaders in CI programs as paramount to the CI success for sustained projects. Participant L2 noted the connection between leadership engagement and CI success by requesting CI as a specific line item for leadership quarterly and annual review. Participant L2 prescribed performance reviews to ensure that all leaders buy-in and engage in the CI process across the organization. Two (33%) participants stated a benefit existed from senior-level leaders meeting directly with employees to discuss CI and specific department level barriers preventing CI initiative success. Sony et al. (2020) argued that leaders generate CI success rates when the organizational leadership includes employees in project formulation and development. Srimathi and Narashiman (2021) suggested that LSS practitioners that use participative leadership styles that include feedback from all levels may see higher levels of success in CI programs regardless of the industry sector. Kane (2020) described the process of leadership engagement as critical but with a requirement for leaders to provide direct supervision and structure to a CI project. Organizations that create a changing culture may see positive outcomes in LSS implementation by

promoting employee involvement, where leadership encourages the employee to learn and develop in CI (Hamm Jr. & Wan, 2021; Sony et al., 2020). The existing literature supports this study's findings that leadership engagement is a strategy for leadership use to create and sustain CI initiatives.

The research findings indicated a relationship between employee engagement and strategies for successful CI initiatives, as demonstrated in current literature. Kane (2020) argued for selecting LSS project teams formulated from employees from all levels and that each member is critical to the project's success. McCarthy (2020) suggested DMAIC teams consisting of employees use LSS concepts to identify problem areas and place control measures for the project's success. Four (66%) participants described the leadership use of Gemba walks to interact with employees at the workspace and allow the employees to present barriers to production. The participants noted that employees were more likely to share and engage as a follow-up from leadership occurred for presented ideas for improvement. Leadership commitment to LSS may benefit from providing means for employee recognition for improvement ideas and encouraging motivation to participate in projects (Flor Vallejo et al., 2020). Participant L1 noted the organization's use of an incentivized program to reward employees who contributed ideas that led to network-wide changes with recognition and a monetized percentage of cost savings. The establishment of a culture of CI where employees engage in the process and support the change dramatically affects the success of the initiative (Null et al., 2020; Sony et al., 2020). The results of employee engagement, when driven by the use of LSS, denote the application of prevention of production barriers and the implementation of a culture

where employees feel involved in the process (Sreedharan et al., 2020). Participant L6 argued that follow-up with employees was essential as a method to encourage employee engagement. L6 stated the importance of "employees feeling heard for each concern." Employee engagement as a strategy for CI sustainment may offer leaders means to provide value and training to the employee level for development for a culture of CI in the organization.

Standardization of CI efforts across an organization may provide leaders with a strategy to sustain CI initiatives. The current body of literature affirms this study's findings for standardization in CI practices. Raveglia et al. (2021) described the use of standardization in an LSS setting as considerably lowered production costs and provided stabilization of varying processes. Three (50%) participants referred to standardized work across the organizational network to ensure repeatability of procedures during a CI project. Participant L1 addressed the replication of standardized workflow across networks so that "an employee can travel to another facility and work with minimal adjustment." Bhat et al. (2020a) suggested that organizations benefit from standardized practices to reduce process mistakes and cost improvements. Leaders may implement the 5S process to standardize production measures across shifts, facilities, and organizations by making processes as similar as possible from one location to another (Klochkov et al., 2019). Participant L3 noted the specific use of 5S as a method of standardization used in the organization. Raveglia et al. (2021) argued for using Kaizen events with employee engagement to develop initiatives with standardized procedures. Organizations achieve standardization using the DMAIC model of six sigma to reduce variations in the process

for repeatable results (Alfaro et al., 2020). Supply chain leaders may use standardization as a strategy to sustain CI initiatives for repeatable results across a large organization.

The larger body of current literature affirmed the research findings that indicated a relationship between training employees and strategies for successful CI initiatives. Sreedharan et al. (2020) argued to include the combination of lean and six sigma for training employee populations to create a culture where reliance on individual principles occurs. Training of project employees in CI methods is critical for project success, and specifically, the DMAIC process may provide teams with tools to successfully develop and implement and project (Kane, 2020). Additionally, Kane (2020) argued to include LSS trained green or black belts to guide a project and provide structure to the project team. Organizations that invest in LSS training for associates may see higher levels of success concerning project outcomes (Null et al., 2020). Sony et al. (2020) described the organization benefits from continual training offered to employees in CI methods and follow-up retraining to refresh CI principles. Sony et al. (2020) continued that all employee levels receive CI training to reinforce the importance of CI and LSS to develop a cultural expectation for the organization. Participant L2 described the value of training "everyone you can" in the organization in CI methods from the top to the bottom to "drive the culture." Sreedharan et al. (2020) suggested that the training level of the employees in LSS methods indicated the potential level of success or related failure the organization might see in implementing a project. Additionally, the cost of the training may deter some leaders from implementing and investing in a culture of LSS or CI (Sreedharan et al., 2020). Four (66%) of the participants described a specific lack of

training for the employee level. The participants described the on-the-job training that the employee might receive in practice from participating in a Kaizen, Gemba, or waste walk. L3, L4, L5, and L6 noted a specific lack of formalized training offered by the organization and contributed CI sustainment to leadership-driven and CI cultural efforts.

## Applications to Professional Practice

The findings of this study may assist supply chain leaders in identifying the best methods to address the high failure rate of CI initiatives and lack of sustainment. The organizational failure rate of CI initiatives may occur at 30% (Antony et al., 2019) and as high as up to 60% (McLean & Antony, 2014), resulting in considerable loss of company expenditures. Leaders require strategies for sustaining CI initiatives as failed projects may result in wasted resources and economic loss (Sunder & Prashar, 2020). Organizations may gain an advantage using lean systems to increase goods and services delivery speeds (Osore et al., 2020). CI methods may provide leaders with the means to improve the quality of products and optimize production rates by reducing variation (Swarnakar et al., 2020). To sustain CI initiatives, leaders must consider the strategies of engaged leaders and employees (Kane, 2020). Furthermore, this study indicates that supply chain leaders may sustain CI initiatives by investing in standardization and training within the organizational network.

The study participants advocated for leaders engaged in implementing and designing a CI project by providing support throughout the entire effort. Supply chain leaders that engage in the CI process from the top-down benefit from CI engagement in the facility from all levels (Flor Vallejo et al., 2020). Leaders of supply chain

organizations can benefit directly from engaging employees in the CI process, as the
participants of this study indicated. Employee motivation to contribute to the CI process
increased when leaders included employees in the CI projects at all levels. The study
results may assist leaders of supply chain facilities with methods to engage employees to
see higher levels of CI sustainment.

Furthermore, the participants indicated success in CI sustainment by investing in
CI training and standardization of processes across the network. The study indicates
training all levels of the organization in CI methods may contribute to greater success
rates of CI. Still, the development of a CI culture is paramount, as the study participants
indicated. Faciane et al. (2021) suggested that an organization must develop a culture
toward CI and training in methodologies to assist in successful CI program development.
Moreover, a leader's use of standardization in CI initiatives across the network may assist
in controlling the implemented process for greater sustainability (Constantinescu, 2020).
The participants agreed that standardization made follow-up with an employee a more
manageable task and contributed to measured processes changes to reduce lost
efficiencies during recalibrating a process.

## Implications for Social Change

Organizations may embrace CI practices to decrease inefficiency and increase
profitability to leverage employment opportunities (Bhat et al., 2020b). Leaders may use
CI methods to increase production rates that improve the economic stability of the
organization to provide employment stability to a community. Competitiveness may
increase with decreased costs associated with the improvement that may contribute to

better economic conditions for employees and their families (Ben Ruben et al., 2018).

Engaged leadership may also contribute to higher levels of quality in work-life balance of

the employee's needs in CI initiatives (Srimathi & Narashiman, 2021). Additionally,

organizational employees benefit from the investment of CI methods as an investment in

the training of the employees for greater economic mobility in the organization (Zimon,

2017). Therefore, sustainable CI practices may provide organizations with the means to

contribute to local communities for a higher quality of life.

Sustainability in the production-based industry may impact society by reducing

resources and conserving energy (Ben Ruben et al., 2018). Reducing the organization's

natural resources and improving green manufacturing practices may provide social

benefits globally (Shokri & Li, 2020). Sony et al. (2020) suggested that organizations can

affect the environment using CI methods to reduce environmental impacts of production

by aligning strategy with greener measures. Green LSS and CI efforts may aid an

organization directly in developing methods to reduce the impacts of waste, emissions,

and resources (Farrukh et al., 2020). The findings of this study may provide positive

social change to people and communities with strategies for CI sustainment for the

generation of employment, green production practices, and reduction of the consumption

of natural resources.

**Recommendations for Action**

Leaders who implement CI sustainment strategies may benefit from increased

project success rates, increased production rates, and decreased costs associated with

failed CI initiatives (Blaga, 2020). Leaders who exemplify engagement in CI processes

may see positive results upon implementing a project based on the leadership team's focus to ensure success (Graham & Woodhead, 2021). Moreover, employees who buy into CI methods may respond better to a change initiative and support the project (Van Assen, 2021). Supply chain leaders who invest in CI methods training may receive economic incentives based on project success and savings generated from efficiency (Bhat et al., 2020b). The results of my study may provide supply chain leaders with strategies to sustain CI programs to benefit from the increased production rates, quality of goods, and engagement of employees across the organization. Based on the research findings, I recommend the following actions:

- Supply chain leaders must ensure all leaders are engaged in the CI process to ensure accountability, follow-up, and buy-in occurs across the organization to support the entire project.

- Leaders should work directly with employees in CI methods and projects to generate engagement where employees interact with a change initiative during the entire process, create buy-in by motivating them to participate, and remove specific workflow barriers.

- Supply chain leaders must invest in training of CI methodology for all levels of employees, create a continual culture of change, institute CI language into the everyday workflow, and offer refresher training for leadership.

- Organizational leaders should provide standardization in processes across the network, communicate changes, and continually update changes to processes as they occur in real-time.

The purpose of this study was to explore strategies that supply chain leaders used to sustain CI initiatives beyond the first year. The findings of this study are essential to supply chain leaders to sustain CI initiatives, increase production rates, improve CI project outcomes, and engage both leaders and employees. I plan to summarize the findings of my study and provide each participant with a copy. I also plan to disseminate the findings of my study using publication into ProQuest, academic journals, local conferences, available workshops, and CI training sessions with process improvement professionals.

### Recommendations for Further Research

The research findings of my study may provide supply chain leaders with strategies to sustain CI initiatives. CI impacts on an organization may affect various industries differently, and further research exists in different industries' effects on LSS (Null et al., 2020). Zwetsloot et al. (2018) argued a specific lack of quantifiable studies exists reflecting positive CI implementation outcomes while many other existing studies are qualitative. Limited research exists on the use of LSS in economies that are developing and require further study (Sreedharan et al., 2020). Gutierrez-Gutierrez and Antony (2020) suggested that little research exists concerning CI initiatives and strategic outcomes of the organization.

Limitations occurred in the formation of this study. First, the sample size was not truly reflective of the larger population of supply chain leaders as I used a smaller sample size of six participants. Next, I included supply chain leaders from one organization that may not reflect the responses that other organization participants may provide. Future

research studies in this area may expand the selected participant sample size to recruit a broader pool representing other organizations. Finally, the selected choice of a single case study provides limitations to the range of data collected from potentially many organizations in a multiple case study procedure. I recommend future research to determine what strategies other organizations may use to sustain CI initiatives. Many industries, such as healthcare and manufacturing, may select CI methods as CI may benefit any work industry sector (Kane, 2020; Sreedharan et al., 2018). Moreover, researchers may wish to explore industry sectors' use of CI and conduct a study reflective of successful strategies to sustain CI projects.

## Reflections

The pursuit of my doctoral research was a challenging but rewarding process to undertake professionally and personally. I conducted a single case study and developed an understanding of strategies supply chain leaders may use to sustain CI initiatives. I related to the idea that all (100%) participants suggested that leadership and employee engagement were necessary for CI success. I realized the importance of engaged leaders and employees in developing a culture of CI sustainment in an organization. I also realized that training and standardization of CI methods greatly assisted leaders in sustaining a CI initiative. During my study and the required participant interviews, I developed a minimal profile to obtain open responses from each participant. I avoided interjecting my area of expertise as a CI practitioner to avoid bias in different participant responses.

Throughout the process of conducting a qualitative case study to understand strategies leaders use to sustain CI projects, I developed an understanding of how to conduct a case study to describe a phenomenon. I found the process of completing a doctoral study a challenge and appreciate the required commitment and knowledge to apply a conceptual framework to a selected topic. The balance required of a scholar-practitioner is great, considering the time commitment for work, family, and studying. I now understand the sacrifice required to complete such an undertaking as a doctoral study. Completing my study expanded my knowledge related to leaders supporting and guiding a CI initiative and employees actively engaged in the creation and process of a CI initiative.

**Conclusion**

The purpose of my study was to explore strategies supply chain leaders used in sustaining CI initiatives at an organizational level. I selected the use of a qualitative single case study to explore the phenomenon related to CI sustainment. Supply chain leaders' use of CI methods emerged as a primary benefit to reducing production costs, improving quality, and increasing efficiency in the workflow (Riley et al., 2020). Many organizational attempts at CI initiatives may fail unless strategies to mitigate failure occur by the leadership team (Al-Akel & Marian, 2020). The intended findings of my study indicate that supply chain leaders may use principles of the TQM conceptual framework to apply CI methods for the sustainment of projects effectively.

For my study, I created open-ended interview questions to generate participant responses to explore each leader's experience in sustaining a CI initiative. I used

purposeful sampling to select participants with specific experience as a supply chain

leader with at least three years of experience in CI methods and implementation. I

transcribed, coded, and analyzed the interview data using NVivo ® software to process

and categorize material. I also collected physical documents from the participants in the

form of an FMEA and a control plan. Upon coding the data, four major themes emerged

that might aid supply chain leaders with strategies to sustain CI initiatives.

The research question for this study was: What strategies do supply chain leaders

use to sustain CI initiatives beyond the first year? The results of the study occurred with

four major themes (a) leadership engagement, (b) employee engagement, (c)

standardization, and (d) training. The resulting themes provided sufficient reply to the

research question for strategies that supply chain leaders may use to sustain CI initiatives.

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Appendix A: Interview Protocol

**Introduction:** Welcome the participant and explain that the scope of the interview is to collect data regarding the main research question and sub-questions.

1. Introduce self to the participant(s).

2. Present consent form, go over contents and answer questions and concerns of participant(s).

3. Give the participant a copy of the consent form.

4. Turn on the recording device.

5. Follow procedure to introduce participant(s) with pseudonym/coded identification; note the date and time.

6. Begin the interview with Question 1; follow through to the final question.

7. Follow up with additional questions.

8. End interview sequence; discuss member-checking with the participant(s).

9. Thank the participant(s) for their part in the study. Reiterate contact numbers for follow-up questions and concerns from participants.

10. End protocol.

**Main Research Question:** What strategies do supply chain distribution center leaders use to sustain CI initiatives beyond the 1st year?

**Interview Questions:**

1. What strategies did you use to sustain your organization's CI initiatives beyond the 1st year?

2. What role has the company's leadership played in the organization for the development of strategies for the sustainment of CI initiatives for longer than 1 year?

3. How did you implement employee engagement as a strategy for the sustainment of CI initiatives beyond the 1st year?

4. What training does the organization provide leaders in CI methods and strategies for the sustainability of CI initiatives beyond 1 year?

5. What training does the organization provide employees in CI methods and strategies for the sustainability of CI initiatives beyond 1 year?

6. How, if at all, did you implement policy deployment and control strategies for the sustainment of your organization's CI initiatives beyond the 1st year?

7. What more can you add regarding the strategies your organization used to sustain its CI initiatives beyond the 1st year?

Appendix B: Invitation to Participate in the Study

Date: _____

Email Address: _____

Email Subject Line: _____

Dear < Invitee Name >,

My name is Jason Williams, and I am presently a student in Walden University's Doctoral Business Administration (DBA) program. To fulfill the requirements of the program, I need to conduct a doctoral research study about supply chain leaders who have achieved success in strategies to implement and sustain successful continuous improvement (CI) initiatives beyond the 1st year. I am inviting supply chain leaders in the management and leadership of a supply chain distribution center from the Midwestern region of the United States. You are a successful supply chain leader, so your opinions and experiences will be valuable in my research.

The title of my research is Strategies for Sustainable Continuous Improvement Initiatives.

The purpose of this study is to explore strategies that supply chain leaders use to implement and sustain successful CI initiatives beyond the 1st year.

As a CI practitioner in supply chain management, I would like to invite you to participate in this research study. Please read the attached consent form carefully and ask any questions that you may have before accepting the invitation. The interview will include seven open-ended questions (attached with this email) that you can provide your opinions and suggestions.

I appreciate your valuable time.

Sincerely,

_____

## Appendix C: Archival Documents

**Process FMEA**

| Process Name: | | Organization: | | Prepared by: | | |
|---|---|---|---|---|---|---|
| | | | | FMEA Date (Orig) | | Revision # |

| Process Step or Key Input | Potential Failure Mode | Potential Effect on Customer Because of Defect | S E V | Potential Causes | O C C | Current Process Controls | D E T | R P N | Actions Recommended | Resp.& Target Date | Actions Taken | S E V | O C C | D E T | Future RPN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| What is the process step or key input? | In what ways can the Process Step or Key Input go wrong? (chance of not meeting requirements) | What is the impact on the Key Output (customer requirements) or internal requirements? | How Severe is effect to the customer? | What causes the step or input to go wrong? (How could the failure mode occur?) | How frequent it is cause likely to Occur? | What are the existing controls that either prevent the failure mode from occurring or detect it should it occur? | How effective is Detection? | Risk Priority # to rank order concerns | What are the actions for reducing the Occurrence of the cause, or improving Detection? Should have actions on high RPN's or Severity of 9 or 10. | Who's Responsible for the recommended action? What date? | What were the actions implemented? Include completion month/year. (Then recalculate resulting RPN.) | Future Severity | Future Occurance | Future Detection | Risk Priority # to evaluate impact of actions |
| | | | | | | | | | | | | | | | |

**Control Plan**

| | | | | | | | | | | Date: | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Process Name: | | | | | | | | | Revision: | | |
| | | | | | | | | | | Approval: | | |

| Ref. # | Process Name/Operation Description | Control Characteristics | | Responsible | Process Specification/Tolerance | Methods | | | | Control Method | Reaction Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Process | | | | Evaluation/Measurement Technique | Sample | | | | |
| | | | | | | | Size | Freq. | | | |
| 1 | | | | | | | | | | | |