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Abstract

With the shift in consumer requirements from availability and price to purpose and value, many companies must consider reviewing their current practices and processes to better align with the customer's value regarding product selection. For a company to effectively compete within their industry's global market, they must meet the minimum expectations of that industry and then excel at key points determined by the consumer that place them above the competition and make their product more purposeful and valuable from a quality perspective. This seminar research paper will cover the transition from a lean-driven production strategy focusing primarily on production efficiency and waste reduction to a hybrid approach that balances lean with an enhanced quality management system (QMS) business strategy to meet and exceed customer quality expectations within the global marketplace. The paper will also address many of the associated challenges and opportunities involved with the sustainability of this organizational change. Supply chain managers must constantly work to balance three critical components of the supply chain: cost, quality, and speed. As companies continually strive to reach an equilibrium with these three elements for success, it becomes apparent that not all components cannot be optimized simultaneously. One element will always be neglected to optimize the other two.

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Section 1: Introduction

As the world quickly becomes increasingly interconnected through technological advancements in communication and globalization, businesses of all varieties: emerging, established, significant, or minor, are presented with an opportunity to enter a global marketplace successfully. To remain successful in their respective industry, they must not only be able to meet and exceed the demands and values of the consumer, but they must also be able to produce at or below the level of cost of their competitors. Incorporating built-in sustainability measures at every level of the organization to create a lasting impression both externally and internally is crucial to the company's long-term sustainability.

The modern consumer has begun shifting what it values in a product. Until recently, consumers weigh products and services using two attributes: functionality and emotional worth. Now, consumers are beginning to shift towards more ethical and sustainable products and companies, and these consumers are willing to pay more for it. Rather than settling for the cheapest and most convenient products, consumers are ready to shop around for a better-quality product from a company aligned to their values. Oliver Freestone and Peter McGoldrick, in their article about the motivations of the ethical consumer write, "...it may well be that consumer values are experiencing a shift from the inward facing materialistic outlook, often associated with the "yuppie" mindset of the 1980s, towards a more socially and environmentally proactive mindset." (Freestone & McGoldrick, 2007)

Regarding ethical consumption, Deirdre S. Shaw, and Ian Clarke, in their article on culturally impacted consumerism due to the changes in moral importance, refer to this as "the degree to which consumers prioritize their ethical concerns when making product choices." (Shaw & Clarke, 1998) The value shift presents many companies with both a challenge and an

opportunity. To continue to remain competitive, organizations must continue to meet the needs and expectations of the consumer. This commitment to the customer can be a daunting challenge for companies that have historically focused on improving production efficiency at the cost of quality. The focus on eliminating bottlenecks and meeting production numbers worked great in the past. However, that was before exponential technological advancements in data management leveled the playing field, and communications allowed many smaller and less established companies to enter an industry as a global provider. Implementation of a quality-centric production strategy where there had previously been a quantity-centric focus on production involves total commitment from all stakeholders and a plan to ensure the sustainability of the organizational change.

A baseline of understanding can be obtained by taking a strategic look at the current literature on the best practices of organizational change from quantity to quality-based production and what processes must be in place to ensure agility and sustainability in the marketplace. Once that understanding is established, the importance of sustainability is much clearer. It becomes apparent that without a robust sustainability plan, there are many negative factors influencing the regression to long-established patterns. Patterns that are no longer aligned to the organization's strategic plan.

Section 2: Theoretical Framework

The foundation and framework needed to execute these changes in a sustainable way are derived from the lean philosophy, six sigma and standard change management planning strategies. A brief explanation of what each of these aspects are and how they align with each other to enable a sustainable change within an organization is needed to fully understand the

scope of the change project and the importance of the foundation and framework within each aspect.

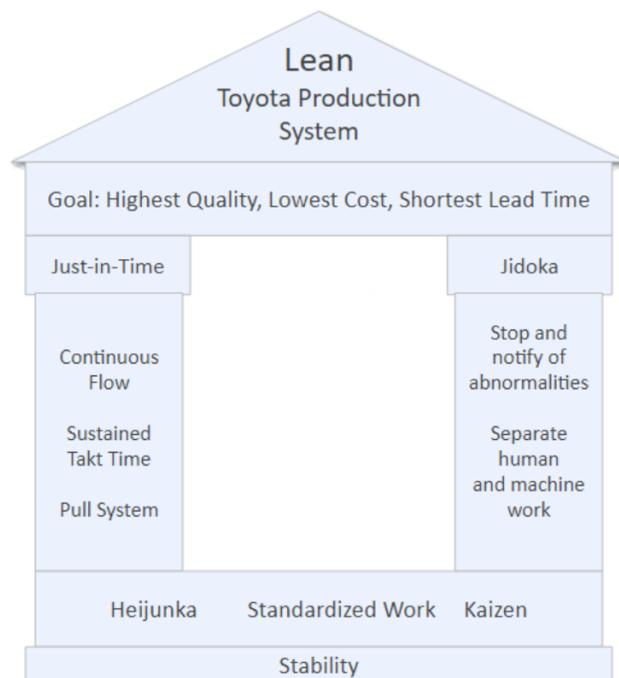
Ultimately, it must start from the very top of the chain when implementing such reorganizing changes to a company, especially when the company has already established itself as a competitive force within its market. Dan Haskin, Professor of Accounting at Texas A&M, in his article on the costs lean nicely captured the initial requirements needed to initiate a change program by writing, “An organization is required to know where it wants to go (the objective) and how you intend to get there (the plan). Consequently, it is necessary to cascade the top-level strategies into the division, department and finally to individual responsibilities, action plans, quantifiable goals, and timeliness.” (Haskin, 2010) To expand on this statement, Rosemary Fullerton and William Wempe in their article discussing lean manufacturing that was published in the International Journal of Operations and Production Management write, “...focuses on measures of continuous improvement, operational efficiency, teamwork, and short-term results will promote the culture where Lean initiatives can survive, thrive and produce results.” (Fullerton & Wempe, 2009)

Introduction to Lean

Within the lean principles there are many applications that individually can be very impactful in removing waste and increasing efficiency. Some examples are Bottleneck analysis, Just-in-Time (JIT), Value stream Mapping (VSM), Plan-Do-Check-Act (PDCA), Error Proofing, and Root Cause Analysis (RCA). However, when these tools are combined and a plan is put into place to take the lean tool set and begin to incorporate them into the culture and processes of the company are the real gains made.

There are several components that need to be established in order for a company to utilize the full benefits of lean. These are represented usually with a house image (*Figure 1*) where each component is either a foundational component (Heijunka, Standardized Work, Kaizen) or a pillar atop the foundation to support the roof which is lean production excellence and cannot exist without the aggregate of the other components working together to build a sustainable culture and environment for continuous improvement.

Figure 1



Source: Kanban Tool . (2021, December 16). *Kanban tool*. Kanban Tool. Retrieved March 17, 2022, from

<https://kanbantool.com/kanban-guide/heijunka>

One of the foundational components that really needs to be established to implement a successful organizational change is Heijunka. A simple definition of this lean technique is Heijunka is a lean manufacturing technique for reducing unevenness in a production cycle. The

word itself means *leveling* in Japanese. It was first used by the Toyota Production System (TPS) to develop production efficiency. It forms the foundation of TPS along with the concepts of standard work and Kaizen. (Heijunka definition, 2021)

To capture the efficiencies to be had when working towards Heijunka there needs to be 5S in place before any heijunka can be implemented. Without 5S, there is a strong chance that the culture of the shop floor may be resistant to the changes and not provide the team with the most valuable information that is needed to evaluate the issues at hand. Many small things can be added to create the problem and generate lots of unnecessary noise in the collected data. This can, in turn, make the outcome of the heijunka skewed and incorrectly balanced or rebalanced, and when one or more of the variables not addressed by 5S is finally changed or removed, it can cause the rebalance to fail and must be done again. This is especially important when balancing processes on large assembly lines where one change in one station requires all previous and subsequent stations to be adjusted.

Standardized work is a prerequisite for any lean technique application, and there must be a baseline or standard to work off to balance the existing processes. Without that standardization, there would be no way of determining or gauging what or how any change would be effective and sustainable because that process could change piece by piece, determined by a multitude of previously unknown variables.

Having flexible and cross-trained employees is beneficial for several reasons:

1. It makes line balancing less burdensome because you can now split tasks or processes causing issues between different stations.
2. There is no need to invest the added resources for training another person to do the added job somewhere else.

3. Having cross-trained employees allows for Jidoka in the process.

Having cross-training in place before and after the assigned task allows the employees performing the work to actively audit the incoming WIP and outgoing WIP for quality assurance. This can be a considerable advantage, especially with highly technical products and products where rework is complex for early steps once the product is completed.

Kanban systems make heijunka applications much nimbler. This is because, using a Kanban system, the parts are kept in small quantities near the work being done. Therefore, when the workload is adjusted to be more efficient and to remove bottlenecks in the process, materials personnel can quickly relocate and recode the parts to be delivered to their new location in the right amount and at the right time.

Value stream mapping is paramount for the heijunka process, and it allows engineering personnel to identify opportunities and where congestion or over-processing is being done. By mapping the process, they can also determine if there are any variables outside of the operations that could be contributing to the issues that need addressing. By visualizing the aggregate process, they can identify and focus more on what areas need the most attention.

[Introduction to Change Management and Change Implementation](#)

Once there has been a push to establish a continuous improvement culture and employees are able to actively be involved in these improvements an organization can take the next steps to implement the change project that moves focus from quantity to quality. Having already proven to the employees at all levels and functional groups that seriousness of this change and the impact it will have on the company's future will strengthen the change initiative and reduce the amount of employee resistance. Additionally, the future state of this change would improve the product's initial quality, which will, in turn, reduce rework labor hours and allow more focus on

improvements and value-adding projects. Furthermore, the culture shift towards quality will strengthen the pride and value employees place in their work and the company's image.

Lowering the cost to produce via employee training programs added quality gate support both lineside and with the incoming material inspection that is working together with the purchasing team to quickly communicate supplier quality adherence concerns will reduce stockouts related to nonconforming material replacement.

Topology of Change Needed

The topology of organizational change needed in this instance fits into the Reorientation cell of the Types of Organizational Change matrix (*Figure 2*). This is mainly due to a push to remain competitive in existing markets and enter new markets without a disadvantage in customer quality expectations. This coincides with writing of John Hayes, who is Professor of Management at Leeds University Business School, UK. He also teaches at Copenhagen Business School and Aarhus School of Business in Denmark. While writing about the different types of organizational change he explains reorientation within the parameters of types of organizational change. There he writes, "The aim is to ensure that the organization will be aligned and effective in the future." (Hayes, 2018) This proactive and transformational reorientation would impact all production and reshape the corresponding company's culture from the shop floor to the top of production leadership.

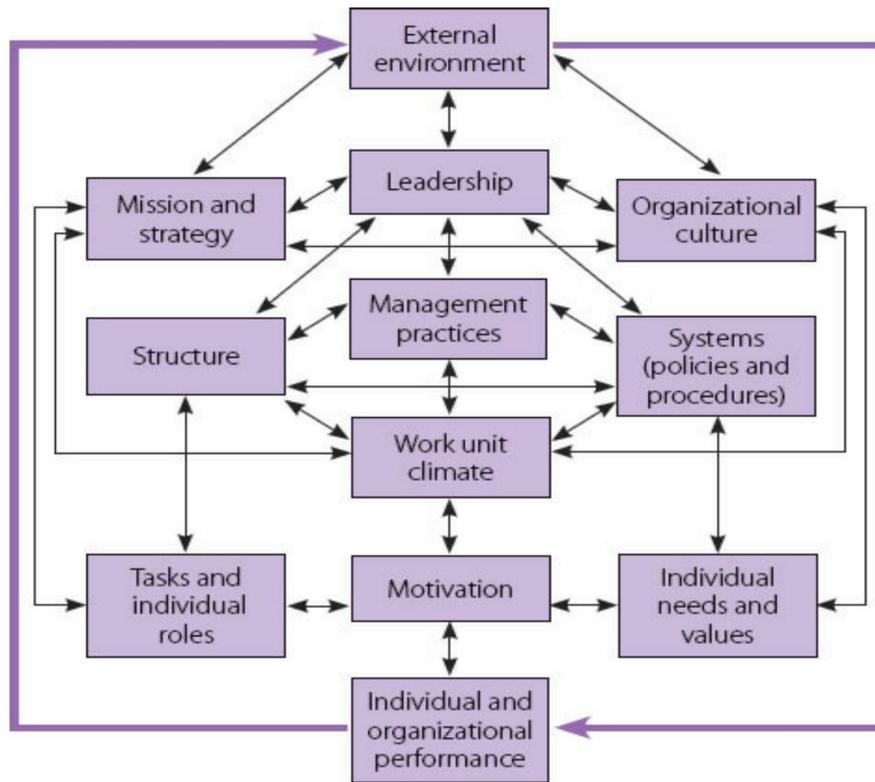
Figure 2

	Incremental	Transformational
Proactive	Tuning	Reorientation
Reactive	Adaptation	Re-creation

Source : Adapted from D. Nadler and M. Tushman, Figure 2.3 Types of Organizational Changes'. From 'Types of organizational change: From incremental improvement to discontinuous transformation'. In David A. Nadler, Robert B. Shaw, A. Elise Walton *Discontinuous Change: Leading Organizational Transformation*, page 24. Copyright ©1995 by John Wiley & Sons Inc.

This change would also benefit most from applying the Burke-Litwin casual holistic model (*Figure 3*). This is because the changes being implemented include a significant push to increase quality above all else. This holistic approach identifies areas that need more focus than others regarding the changes being made. Since the focus is to improve quality, the quality department, its team members, and the processes they control and monitor will have a more significant role in the change.

Figure 3



Note: Burke-Litwin casual holistic model for change. (Hayes, 2018)

Because this model can capture how organizational performance and effectiveness are affected and how different levels of business influence each other regarding the changes made, it is an excellent fit for the change that encompasses the entirety of the organization's production process.

Furthermore, since this change is a proactive transformational reorientation, it is vital to capture the cause-and-effect relationships between the organization's internal and external environments. There are action plans to strengthen the impact and cooperation. Communication between these identified stakeholders and functional groups effectively reduces the siloing effect that can hinder continuous and cultural improvement initiatives.

Lastly, this change model does a great job of distinguishing between the transformational and transactional dynamics in organizational behavior and change, which is an essential factor when the change involves a cultural shift aligned with the organization's future state and is imperative to the sustainability of the change.

This transformational change is influenced heavily by the external environment, specifically updated customer expectations and requirements. It will also transform its mission, strategy, leadership organization, and culture alike. Transactionally, the changes made will be to data collection and accountability on the lowest level of production. Still, they must be managed for adherence and sustainability as not to slow change momentum in the future. WW. Burke and George H. Litwin, in their article on organizational change and performance, highlight the affected components of transactional change by stating, "transactional factors are affected - structure, systems, management practices, and climate." (Burke & Litwin, 1992)

Stakeholders

Since this is a requirement of the end customer to recompute for future contracts within the most extensive business segment, everyone is a stakeholder to some degree. More specifically, those involved in rolling out the change to the production plants and those enforcing the changes in the future to ensure there is minimal resistance and that roadblocks and resolved issues are done so aligned to the new changes.

Corporate leadership and shareholders understand the importance of this change. They have made the intent to evolve into a more quality-based and technologically advanced corporation that can compete and exceed customer expectations among its competitors. As you can see in *Figure 4* below, the critical leadership tasks for successful change cover everything from the initial vision to the maintenance and sustainability of the change. This means that

leadership should be involved at all levels from start to finish the organizational change. If they are not involved and supportive for the project’s entirety, there leaves room for failure or only partial success.

Figure 4

Sense making	Make sense of the world and identify the opportunities and threats that require attention
Visioning	Identify a vision of what a more desirable state of affairs might look like and what needs to be done to move towards this better future
Sense giving	Communicate the vision to a wider audience and respond to feedback as required to win commitment to the change
Aligning	Promote a shared sense of direction so that people can work together to achieve the vision
Enabling	Remove obstacles and create the conditions that empower others to implement the change
Supporting	Recognize and respond to the concerns of those affected by the change
Maintaining momentum and sustaining the change	Show commitment and ‘walk the talk’ – demonstrating that they are prepared to change their behaviour as well – to keep people focused on the change

Note: Key leadership Tasks. These are the most important leadership tasks that are essential to successful change projects. (Hayes, 2018)

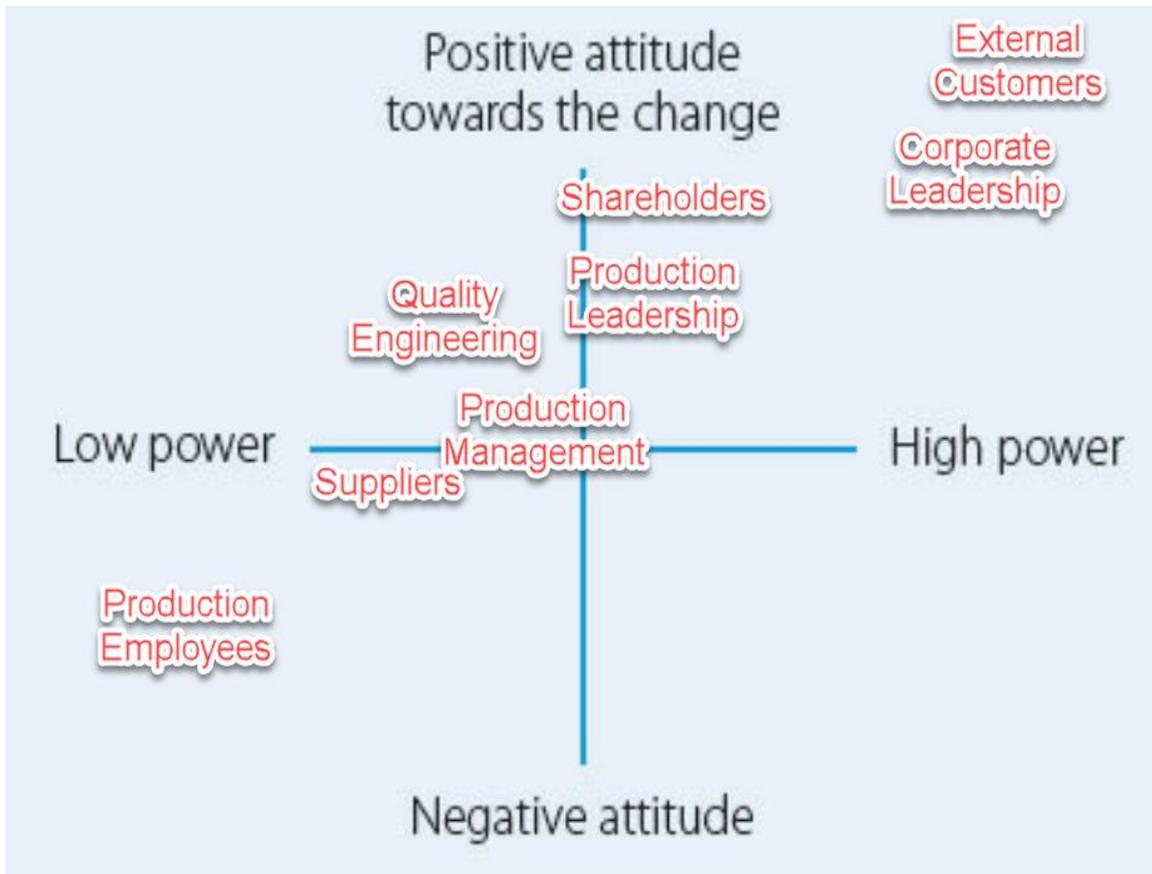
However, the amount of leadership involvement can vary in each task depending on the amount of buy-in and previous alignment to the new change. The most critical job in this situation is maintaining and sustaining at the end. This is because in many instances where quantity trumps quality the workplace culture has been to do what you are asked and do not question the reasoning behind management decisions. To break old habits and gain approval from the workforce, it is imperative to lead by example and show the results, steps, and sacrifices made to ensure successful implementation and future sustainability.

Another reason for this need for commitment from leadership is that their output measures production managers’ success. Initially, improving quality will slow production rates and negatively affect those leading the production employees. If not monitored by upper

management, these stakeholders can quickly revert the change to its previous state. The values are not adjusted to what the company expects and is willing to accept as a new standard for success. John Hayes, in his writing on change management expands on this notion by saying, “If the politics and emotions are left unattended, fear, anxiety, and panic can wreak havoc on any change process. These types of feelings can create resistance and disengagement, as well as resulting in a drop in morale, performance, and employee retention.” (Hayes, 2018)

Looking at *Figure 5* below, you can see the trend line in where the power lies and who is supportive of it. In a hierarchical organization and where a change comes from the top of the ladder, it will be heavily influenced by cost and share value. Furthermore, once the shift trickles its way down to the production management, suppliers, and production employees, where they have little to no influence on the changes being made, they also have less inspiration and acceptance of these changes. Sustainability has always been an issue in the past, and management exercised a lack of communication due to siloing in functional groups and a “need to know” mentality.

Figure 5



Note: Stakeholder Grid. This is approximately where the stakeholders are positioned on the stakeholder matrix in relation to power and attitude (Hayes, 2018)

This would be put into action initially through high-level staff meetings where leadership will assign expectations and deadlines for operations management to deliver to their team members the information and the process changes about to rollout. There will also be a strong presence of quality team managers and an increase of quality responders assigned to each area to answer questions and help relieve the tension created by uncertainty and doubt from team members that are not privy to the planning and execution of the upcoming changes.

Additionally, since there is a vast amount of means of communication available to team members, they would all be utilized to maximize the impact of the change and show employees that this is supported by the organization as a whole and at all levels of the business. There would also be regular training of employees and resources available via the intranet and added to the signage in every work center that would continually restate the reasoning and the desired outcome as well as the appreciation of the commitment of employees to accept and become involved in future changes that are aligned to the desired direction the company is planning to go.

Opportunities

The opportunities to be gained from this change greatly outweigh the challenges. Using change management tools like SWOT analysis tool and a Force-Field analysis tool, it is easy to discern the stakeholders affected and the impact of the change. After reviewing the analysis results and devising action plans to combat and reform any undesired outcomes, it is still apparent the need for this change to occur. Since this is a proactive change to move the company in a desired future direction, there must be certainty in the change process and its implementation.

After reviewing a SWOT analysis, it is easy to see the issues that may need to be considered more carefully before taking any action. As can be seen see in *Figure 6* below, with a well-planned training regimen and strategy for employee retention, there is no reason (aside from the obvious pandemic-related items) that all the opportunities cannot be obtained.

Figure 6

SWOT Analysis	
Strengths 1. Higher quality parts and materials 2. Built in quality 3. Traceability 4. Employee pride in work done	Weaknesses 1. Employee resistance to change 2. Internal training regimen not established 3. Too much changing at once 4. Sustainability and process capturing
Opportunities 1. Reduced Rework hours 2. Repurposing of yard rework queue 3. Reassignment of EEs to understaffed areas 4. Reduced labor cost	Threats 1. Churn in leadership 2. Attrition due to retirement 3. Pandemic related supply chain issues 4. Reduction of throughput

Note: SWOT analysis showing the strengths, weaknesses, opportunities, and threats with a quality focused organizational change

Using a Force-Field analysis tool to present the collected data in a more simplistic and opposing forces style, there is a more apparent distinction between the opposing forces affecting the change that is being proposed. This can easily be seen in *Figure 7* below, where most resistances or forces against the difference come from internal elements aside from the supply chain factor presented. However, this issue is already being addressed via a separate strategic initiative project that the Global Procurement and Supply Chain (GPSC) team is working through to create sustainability and reduce its environmental footprint on the environment and the communities in which they operate.

Figure 7

Force-field Analysis Tool		
Forces Supporting Change	Proposed Change	Forces Against Change
Customer requirements	Convert production process from a quantity driven approach to a quality driven approach	Workforce resistant to change
Labor costs		Complete refocus on production expectations
Quality reputation retention		Redesigning quality-gate process
Recompeting for contracts		Implementation of new technology for recording/documenting quality
Continuous improvement initiatives		Complete buy in by all levels of leadership and functional group
New product development projects		External suppliers' ability to meet new tightened specifications for supplied products
Design Engineering efficiency		Attrition and loss of tribal knowledge

Note: Force-Field tool showing polarity in the effects of changes made.

Challenges

Being a change focused on quality improvement, focusing on the root causes of quality issues both internally and externally will have helped develop the process changes and training needs for the change. Process changes include the implementation of advanced data collection tools that are integrated into the quality assessment dashboards currently in use and the transparency of allowing the customer to easily access this data for their audits. This release of information is not exclusively being done because the company only wants to improve its relationship with the customer. It is also to increase trust and commitment internally to further instill the changes made and to promote a continuous improvement culture. One way to improve this data accessibility would be an upgrade in tooling and digitizing the process to allow for immediate and accurate documentation and data retrieval. It will ultimately enable the quality

engineering team to pinpoint the origin of defects and resolve them much quicker more accurately. Moreover, this efficiency will free up some bandwidth from the quality engineers and their liaisons to be more proactive in catching these issues and having a solution to the problem before it arises.

Sustainability and Training

For the change to continue in the desired direction and to establish itself as the new cultural norm within the organization, there must be a push to utilize every avenue of communication and employee involvement and training opportunity available. This calls for the principles, assumptions, and values that underpin the implicit and explicit rules guiding behavior to be revised. It involves a change in the organization's culture. It also calls for a change in the organization's mission and strategy, and for managers at all levels to provide a lead and behave in ways that clarify the new process and encourage others to act in ways that will support it.” (Hayes, 2018)

To illustrate, this will be accomplished by holding regular weekly team meetings that bring everyone together to discuss the path forward for the week and address any concerns or questions from the previous week. To expand on this, the data points being documented as well as the goal and expectations of the company to improve these metrics will be presented to the entire team as well as displayed on the shop floor as large visual graphs that show the employees the gains they have made with the change and to reinforce the decisions of the company as the correct course of action.

Since cultural change does not happen overnight and there are many unknown internal and external factors that can affect the desired change in culture, it is imperative that the company communicates to all management its expectations of getting their employees involved

in the sustainability of change. There will be new committees created that will be cross-functional and cross-hierarchical. Showing team members that their voice matters and that leadership values their input will help instill the trust in the company needed to maintain momentum in the push for change. These newly founded committees will be heading the sustainability aspect of the change by putting those affected in charge of maintaining it with the backing of the leadership and the company alike. Jason Little, in his book about the lean change management model, said it best by simply stating, “The people who write the plan don’t fight the plan.” (Little, 2014) This is a very accurate statement and one that can be easily put into action using employee involvement. Letting the people affected make the changes to improve the modifications applied to them will strengthen the existing change and create an environment and culture that is receptive to future change because they have an essential role and voice in its outcome.

Aside from regular training and availability of new and qualified quality resources, there should be monthly employee engagement surveys to capture and determine the successes and failures of the change. These can be presented via the company’s internal intranet or in a simple short question format using a 5-point Likert scale ranging from strongly agree to strongly disagree. These results can then be used to adjust the direction of focus to ensure sustainability and capture what has worked well so it can be documented and incorporated into future organizational change initiatives.

Incorporating this change initiative into existing lean practices discussed earlier, the culture changes the employees have already accepted will help ensure there is no recidivism to the previous state and revitalize the lean techniques that may have lost momentum or become stagnant over time.

Section 3: Literature Review

There are many factors and that can impact how effective or ineffective a change initiative can be within a company. Therefore, the strategic planning must cover all aspects of the organization and it needs to address all stakeholders equally due to the scope of the impact extending further than just the boundaries of the company alone. The impact will reach everyone doing business with the company both up and downstream within the supply chain.

In the Journal article by David Collis, he relays the importance of entrepreneurship and strategy, both sharing a symbiotic relationship in the “lean strategic process” (Collis, 2016). Simply put, a business needs to have the structure and process-driven approach that strategic planning provides. However, it still needs to allow entrepreneurship as a balance to enable agility and the ability to be innovative enough to spur growth.

It is evident in the article that there must be a system for both approaches to thrive. When explaining the reasoning behind this balance, Collis says, “Every choice is an irrevocable rejection of something else” (Collis, 2016). Strategic planning sets a very rigid path that can be the foundation of the process. However, by still allowing room for the people to try and improve this process through trial and error within the boundaries of the strategic plan, improvements can be made and value-added to the product.

Another approach to ensuring a successful quality improvement initiative is to take a more process driven scientific approach. Aligning with the principles of lean six sigma (LSS) quantitative metrics can be used to highlight issues that would be hard to pinpoint in a complex or technical manufacturing environment.

In his article about cycle time reduction, Gregg Young concisely rationalizes how taking the framework of a cost-time profile and incorporating lean principles and the Theory of Constraints (TOC) can effectively be used as a contemporary key performance indicator for cycle time reduction. He validates his reasoning by giving a brief history on the pioneering of the cost-time profile and the profound competitive advantage gained in 1981 by Westinghouse Electric Corporation (Young, 2015). Westinghouse was a leading manufacturer of electrical equipment and is best known for constructing and marketing alternating current electrical systems, which replaced direct current electrical systems that previously powered the United States. The cost-time profile, an expansion of the graphic-time profile designed in the late 1960s, received the prestigious Malcolm Baldrige National Quality Award (MBNQA) in 1988 for its successful quality management system excellence.

Young proceeds to explain how the cost-time profile can be modified to address cycle time by implementing lean and TOC into the formula to get a visual real-time metric to apply to the modern methods of competitive advantage such as waste reduction and cycle time reduction. He proceeds by walking through building an active-time profile and gives some case study examples to show how to apply the data to the profile. In addition, this process can be determined through visual representation (that is much easier to decipher than the standard quantitative data typically generated in these metrics) to focus on eliminating waste and reducing cycle time. To expand on this, Young then uses the processed data to formulate an improved active-time profile that can be simulated in real-time before making any impactful decisions.

Lastly, A macro look at the process incorporates uptime, manpower, and scrap rate data, labor, material, overhead costs, and selling price to reveal the capacity and profitability of the process (Young, 2015). This financial analysis can help with future strategic planning and

procurement strategies based on manipulating the data and comparing it to current practices and processes with little to no impact on day-to-day operations.

This is a very good way to test different scenarios without directly affecting the recent organizational changes made to improve quality across the board with changes to expectations and involvement that are very fragile when new changes are first implemented.

Like that of the scientific method used by many scientists to test their hypotheses is the LSS approach on process improvement. This tool is known commonly as DMAIC which stands for Define, Measure, Analyze, Improve, and Control.

The authors Ismail, Ghani, Rahman, Deros, & Haron, explain the value of implementing Lean Six Sigma techniques to determine how to detect and eliminate the waste in a process analytically and then offer ways to sustain the improvements through poka-yoke implementation. They used a method from a manufacturing company and then used a tool from Six Sigma to evaluate and modify the said process. The instrument utilized was DMAIC. This tool builds on the foundations of several other lean tools, and it systematically puts them together to work together and eventually lead to the outcome being sought after.

The case study methodology took the process that was being used and defined it by entering it into several different visual representations that made the process easy to understand. It also made discrepancies in the process easy to point out and determine where and in what quantitative value each anomaly held. In this case, the plan was to reduce cycle time, so time was measured as the primary variable. The process was represented with a Functional Process Map (FPM). This is like the value stream map, but it includes where each procedure was performed and breaks them down into three value-added components. These are Customer value-added (CVA), Operational value-added (OVA), and Non-value added (NVA). Each category also

shows the amount of time taken. Then, the sum of each type can be measured against one another to get percentage values for how much NVA is within the process.

With processes being dissected and arranged in visual graphics that would not typically be seen on the shop floor, process leadership and their audit teams can add tangible value to otherwise intangible aspects of the process. By capturing the time of each micro-step of the process, the company can begin to add time as a weapon in their arsenal towards competitive advantage. As the authors state, "...cycle time reduction is an approach to business profitability improvement that enhances a company's capability to use time as a strategic weapon to compete and win in the intensely competitive global market" (Ismail, Ghani, Rahman, Deros, & Haron, 2014). With this implementation of Lean Six Sigma tools, they were able to identify and eradicate 54% of the cycle time specified as waste (NVA).

To ensure lasting sustainability of culture and quality changes there must be a regular visual event that keep the momentum of the change so they can be instilled within the workplace as the new norm. One such event is known in lean philosophy as a kaizen event. This is a structured process in which a team will focus on a small issue area and root cause every anomaly within the targeted area and work to eradicate the source of the issue. By doing this all parties see the commitment of the team executing the kaizen and their interest of involving the employees in improving their own areas of interest.

Using a very systematic and scientific approach to the planning and implementation of lean techniques to get the most value from them through sustainable practices, the authors Farris et al. can determine that, "...through standardized kaizen events, companies can bring issues to the surface that were otherwise invisible among the excess noise created in the inefficient process." (Farris et al., 2008) Furthermore, if they cannot eradicate this waste directly, they can

begin to create the mechanisms needed to fix the issue at hand and make the flow more even and smooth. Focusing on the lean principle of creating knowledge to empower the people to utilize the kaizen tools more effectively allows the team to have much more productive kaizen events. In a way, this is kaizen within kaizen if one were to look at it that way.

Section 5: Methodology

This research paper is a collection and analysis of the processes and tools used by several functional groups within a company's supply chain. It emphasizes the areas of interest that can often be overlooked or given less value when making large-scale organizational changes. Part of the methodology was to organize the research and data to raise awareness and focus on some of the latent opportunities and challenges to expect in large-scale organizational changes. By comparing and combining peer-reviewed case studies, journal articles, and textbooks written by some of the most well-versed experts regarding supply chains with real-world supply chain management experience to help guide the structure, emphasis, and importance of this awareness.

Being aware of the scope and investment needed to execute such a significant organizational change immensely increases the chances that there will be minimal resistance and setbacks. Planning can be in place ahead of time to combat uncertainties and ensure a sustainable and successful transition from quantity to quality and ultimately towards a future of continuous improvement where the instilled culture is aligned with the company's direction and values and the society in which it operates.

Section 4: Conclusion

As the world quickly becomes increasingly interconnected through technological advancements in communication and globalization, businesses of all varieties: emerging, established, significant, or minor, are presented with an opportunity to enter a global marketplace

successfully. To remain successful in their respective industry, they must not only be able to meet and exceed the demands and values of the consumer, but they must also be able to produce at or below the level of cost of their competitors. Incorporating built-in sustainability measures at every level of the organization to create a lasting impression both externally and internally is crucial to the company's long-term sustainability.

It is clear that to implement such large-scale changes within a company and to ensure it will continue to be meet and exceed the needs of the customer and remain competitive in their industry there cannot be any aspects that were overlooked or were not given enough attention to. These are the areas that will potentially be the cause for recidivism to the former state that was deemed unsustainable and the reason for change in the first place.

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