

Empowering Frontline & Implementing Visual Boards key to Lean Six Sigma Success

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Abstract

Lean Six Sigma, a methodology designed to eliminate waste and improve efficiency, has gained significant traction across various industries. However, much of the existing literature focuses heavily on leadership, strategic planning and empowering frontline, with limited attention given to the operational roles of frontline employees and the practical use of visual management tools. This paper aims to bridge this gap by highlighting the critical contributions of frontline employees and visual boards in achieving and sustaining organizational objectives. Through case studies, analysis, and practical experience, this research explores how frontline employees, when equipped with visual boards and performance huddle practices can uniquely contribute to Lean Six Sigma initiatives by identifying and eliminating waste, leveraging their proximity to operational processes. Collecting and analyzing data to drive informed decision-making. Promoting a culture of continuous improvement through innovation and problem-solving. In addition, the paper emphasizes the role of visual boards in fostering transparency and a data-driven decision-making culture. While visual boards are often discussed in isolation, their combined use with frontline engagement remains underexplored in literature. To unlock the full potential of frontline employees, organizations must **empower and engage** them through a supportive environment and inclusive Lean Six Sigma practices. Provide training and development to enhance their skills and confidence in applying Lean Six Sigma tools. Implement **visual boards** as an integral part of operational improvements. **Recognize and reward** their contributions to sustain motivation and participation. By addressing these dimensions, this paper provides a comprehensive perspective on the underappreciated roles of frontline workers and visual management tools in Lean Six Sigma, contributing to both theory and practice.

Keywords

Lean Six Sigma, Frontline employees, Continuous improvement, Visual boards, Empowerment and engagement.

1. Introduction

In today's highly competitive business environment, organizations are constantly seeking ways to enhance operational efficiency, improve quality, and deliver superior customer value. Lean Six Sigma (LSS) has emerged as a powerful methodology that combines the principles of Lean manufacturing and Six Sigma to achieve these goals. While much attention has been given to the strategic and managerial aspects of LSS implementation, the critical role of frontline employees—those who are directly involved in the day-to-day operations—often remains underappreciated.

Frontline employees possess unique insights into the intricacies of organizational processes, making their involvement crucial for the identification and elimination of waste. Their hands-on experience and proximity to the operational workflow enable them to detect inefficiency and suggest practical, actionable improvements. However, despite their potential to drive significant enhancements, many organizations fail to fully leverage the capabilities of their frontline workforce in LSS initiatives.

Despite the recognized benefits, there remains a gap in understanding how to systematically involve frontline employees and effectively utilize to sustain a culture of continuous improvement and innovation.

This paper aims to address this gap by exploring the following aspects:

How can organizations better engage and empower frontline employees in LSS initiatives?

What role do visual boards play in enhancing frontline engagement and driving data-backed decision-making?

The power of developing Waste Eyes, through bespoke learning and development program.

1.1 Objectives

The objective of this paper is to investigate and elucidate the critical role of frontline employees in the successful implementation and sustainability of Lean Six Sigma initiatives. By examining case studies, empirical data, and practical experiences, this paper aims to:

- Identify the specific contributions of frontline workers in identifying and eliminating waste within organizational processes.
- Explore the importance of frontline employees in data collection and analysis to inform decision-making and problem-solving.
- Highlight the role of frontline workers in fostering a culture of continuous improvement and innovation.
- Assess the impact of visual boards in enhancing frontline engagement and driving data-backed decision-making.
- Provide actionable strategies for organizations to empower, engage, train, and recognize frontline employees to maximize their potential in Lean Six Sigma projects.
- The key challenges faced while inducing this culture and ways to manage them.

Ultimately, this paper seeks to demonstrate how leveraging the insights and involvement of frontline employees can lead to significant improvements in operational efficiency, quality, and customer satisfaction.

2. Literature Review

In today's fiercely competitive landscape, fostering a culture of continuous improvement and innovation stands as a cornerstone for organizational success. Productivity and quality, paired with innovation and creativity, ensure not just survival but sustained growth. Frontline workers often occupy the pivotal role in this transformation, bridging strategic aspirations with operational realities.

There are many prominent studies being undertaken which give quite interesting insights, for ease of understanding have segregated these studies into high-level categories:

The Role of Frontline Leaders in Lean Transformations -

Rizzardo (2024) eloquently highlighted the significance of engaging frontline leaders in lean transformations. These leaders, who directly oversee the majority of an organization's workforce, wield considerable influence. However, they are often underprepared for their roles in driving lean initiatives. Rizzardo emphasized that for lean transformations to succeed, the most profound behavior changes must occur at the frontline leader level. The challenge lies in equipping these leaders with the necessary skills and mindset to embrace their pivotal roles effectively.

Empowering Frontline Staff for Quality Improvement –

Jack Needleman et al. (2016) explored the Transforming Care at the Bedside (TCAB) initiative across 67 hospitals, showcasing how engaging frontline staff in quality improvement (QI) initiatives yields remarkable outcomes. With over 90% of unit-based teams conducting successful tests of change, staff participation soared, and innovation flourished. The initiative's success underscored the importance of empowering frontline workers, fostering their involvement in decision-making, and cultivating a culture of experimentation.

Skills for Frontline Quality Improvement -

David Wright et al. (2021) examined the essential skills for frontline staff in the NHS to deliver QI. They identified three critical skill sets: technical (e.g., Lean methodologies and PDSA cycles), soft (e.g., transformational leadership and communication), and learning skills (e.g., fostering team-based learning). While much literature focuses on managerial competencies, this study illuminated the broader skills needed by frontline health professionals to effect meaningful changes.

Drive Innovation - Olivia S. Jung et al. (2023) demonstrated the power of frontline innovation contests in Federally Qualified Health Centers. These contests encouraged over 1,400 employees to propose more than 2,200 improvement ideas, emphasizing operational, patient-centered, and staff support enhancements. The process not only generated actionable solutions but also fostered inclusivity, cross-hierarchy collaboration, and a culture of innovation.

Frontline Service Employees and Customer Engagement -

Adil and Danish (2022) delved into the role of frontline employees in customer engagement within the service industry. They highlighted the profound impact of employee attitudes on customer satisfaction and engagement, especially during complaint resolution. Their study urged organizations to recruit proactive individuals for frontline roles and to cultivate this disposition through supportive work environments. In their publication they referenced the study of mobile phone users Cambra-Fierro et al. (2014) highlighted, probably for the first time, the role of frontline service personnel in shoring up customer engagement. They reported that the attitude of frontline employees significantly improves customer satisfaction and engagement. Their results also suggested that the impact of employee attitude on customer satisfaction and engagement is stronger when customers have registered a complaint v/s when no complaint has been registered.

The results of this study carry significant implications for marketing practitioners. First and foremost, banking companies must consider the meaningful role of their frontline staff in generating an engaged customer base who hold substantial value regarding the future of the company. As customer engagement improves corporate reputation and financial value of companies (Van Doorn et al., 2010) through non-transactional behaviors such as blogging and referrals, banks are convincingly advised to emphasize the type of employees manning their customer contact counters. Specifically, we recommend that employees with a proactive disposition must be preferred to occupy frontline desks in Indian retail banks. It would be particularly relevant because aggrieved customers first approach the frontline staff for rectification of service failures and the first-hand impression of a compassionate and efficient recovery effort might go a long way in nurturing a strongly engaged customer base.

Towards that purpose, Indian banks need to upgrade their recruitment and selection procedures to incorporate a mechanism for evaluation of the proactive tendency of the candidates. In addition, Robbins et al. (2009) suggest that, apart from heredity, human personality is also equally shaped by the environment. Based on the theory of interactionist psychology, Snyder and Ickes (1985) argue that an individual influences her environment as much as she is influenced by it. Taken together, these theories suggest that employee proactivity may be nurtured by suitable managerial intervention in the work environment of employees. Hence, not only should employee proactivity be emphasized during selection and recruitment procedures, but Indian retail banking companies are recommended to design the work environment in a way that cultivates proactivity.

Continuous Improvement through Frontline Empowerment -

Kepner Tregoe and Joe Beezhold emphasized the transformative potential of empowering frontline teams. By equipping these workers with tools, training, and responsibilities, organizations enable them to lead initiatives on efficiency, safety, and best practices. Similarly, Weever (2020) underscored that employee engagement is the linchpin of operational excellence, aligning corporate priorities, resources, and staff enthusiasm.

Case Studies: From Challenges to Transformation -

The Grossman Group's case study on a global auto parts manufacturer illustrated how frontline engagement can drive operational transformations. Through targeted leadership development programs, the organization achieved double-digit gains in employee engagement and set new benchmarks for operational excellence. Michael Grubich's (2023) insights further echoed the value of nurturing frontline managers, emphasizing measurable benefits such as improved leadership, skill application, and employee retention.

Additional Perspectives on Frontline Engagement -

TeamAssurance (2023) emphasized the significance of empowering frontline workers to initiate quality improvements. They stressed that frontline employees, as experts in their roles, are well-positioned to identify issues and propose effective solutions.

Weever (2020), citing findings from McKinsey, highlighted that over 75% of Operational Excellence (OpEx) initiatives fail to achieve ROI due to a lack of frontline engagement. They proposed three interrelated requirements for success: corporate alignment, tools and resources, and employee engagement.

The 2012 Gallup report on the “State of the American Worker” quantified the impact of increased engagement: a 40% reduction in safety incidents and quality defects, a 37% drop in absenteeism, and over 20% improvements in productivity and profitability.

Emerging Insights and Future Directions

Across industries, several recurring themes emerge:

- Engaging and empowering the frontline.
- Creating environments conducive to learning and innovation.
- Providing platforms for idea generation.
- Recognizing and rewarding contributions.
- Developing soft skills.

These factors collectively foster a culture of improvement and innovation.

While existing literature offers valuable insights into the importance of frontline empowerment, several gaps remain. For instance, most studies primarily focus on skill development and leadership training for frontline managers, leaving a gap in understanding how specific tools like Visual Management or Developing the Waste Eyes impact frontline staff's ability to drive change. These two additional dimensions that deserve further exploration: Visual Management and empowering front line through customized lean awareness programs like “Developing the Waste Eyes”. These approaches hold the potential to enhance frontline empowerment by promoting transparency and enabling workers to identify inefficiencies.

The studies reviewed here paint a compelling picture of the critical role frontline workers play in driving organizational success. By equipping these individuals with the right tools, skills, and environments, organizations can unlock untapped potential.

The paper will focus on the significance of factors like visual boards, customized lean awareness programs and how to implement them which are critical to address several areas:

- **Unlocking the Untapped Potential of Frontline Employees** - Frontline employees are uniquely positioned to identify inefficiencies and propose actionable solutions due to their proximity to operational processes. However, without targeted training in Lean Six Sigma methodologies, their ability to contribute effectively remains underutilized. This gap undermines organizational efforts to achieve operational excellence and stifles the potential for grassroots innovation.
- **Enhancing Data-Driven Decision-Making** - Visual boards serve as dynamic tools for promoting transparency and fostering a data-driven culture. Despite their operational benefits, literature often isolates visual boards from the broader framework of employee empowerment and engagement. Addressing this disconnect is essential to harness the full potential of visual boards in supporting Lean Six Sigma initiatives.
- **Bridging the Strategy-Execution Divide** - The predominant focus on strategic leadership in Lean Six Sigma literature neglects the execution layer, where frontline employees operate. By equipping frontlines with the necessary skills and integrating visual boards, organizations can bridge this divide, ensuring that strategic objectives are translated into actionable improvements at the ground level.
- **Driving Sustainable Continuous Improvement** - A culture of continuous improvement thrives on the active involvement of all organizational layers. Empowering frontline employees with the right tools and skills not only enhances immediate operational performance but also fosters long-term sustainability in Lean Six Sigma practices. Addressing these gaps supports the development of resilient systems that adapt and evolve with changing organizational needs.

This paper seeks to build upon these findings by delving deeper into visual management and the concept of developing the waste eyes, offering actionable strategies for cultivating a culture of excellence.

3. Methods

This study includes a mixed method which includes Survey with selective senior leaders from 4 different industries, and Focused group discussion with managers of Shared services organization.

The study was performed between the period of Jan 2023 and Aug 2024.

4. Data Collection

Survey: Group of senior leaders identified from various industries to understand their experience of visual management and training the frontline on Lean Six sigma. Total 11 questions asked in the survey along with 1 free flow comment section to share their experience.

Focused group: Discussion with 4 groups comprising of 26 managers from Finance, IT support, HR operations, Procurement to understand the impact on operations post developing front line of Lean six sigma and implementing visual boards. Data on productivity and SLA performance collected pre- and post to validate the experience shared by managers.

5. Results and Discussion

5.1 The survey results

The survey title Lean Six Sigma – Role of frontline in operational excellence was filled by 29 leaders, the survey was rolled out on Social Media Platform LinkedIn, for managers and senior leaders.

The rationale was to understand the impact of lean six sigma felt by leaders of different industries. To avoid any kind of authors bias, the survey was rolled out on social media platform, with an appeal made to Senior leaders to participate in the survey and share their opinion.

The sectors of respondents: Figure 1, highlights the sectors of respondents 52% respondents are from ITES/BPO sector, 24% are from Shared services. Interestingly all major sectors' participation was observed.

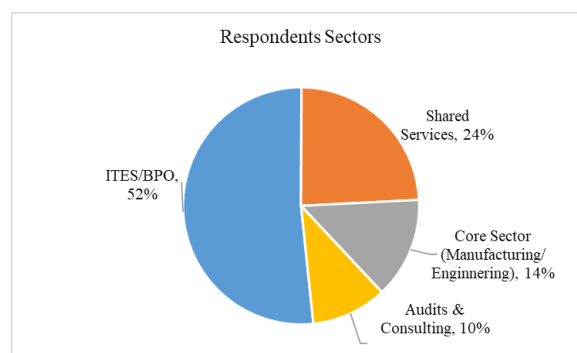


Figure 1. Respondent Sectors

Respondents profile – Figure 2:

59% of the respondents are Senior Manager/Manager.

27% of the respondents are AVP/Director.

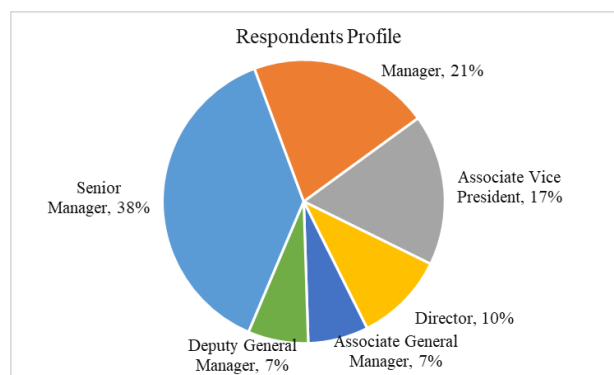


Figure 2. Respondents Profile

The survey aims to understand the usage of lean six sigma and visual boards in the respondent's organization or department.

76% of respondents highlighted that they have specific programs for frontline members for lean and six sigma. Similar numbers of respondents also agree that their team use visual boards to track progress and performance (Table 1- Table 3).

Table 1. Lean Six Sigma awareness

Question	Yes
Have you or your team received training on lean practices or Six Sigma?	93%
Do you have any specific lean six sigma awareness program for frontline members	76%
Does your team use visual boards (e.g., Kanban boards, dashboards) to track progress and performance?	76%

90% of respondents agreed (Strongly agree + agree) that empowering front line employees with lean six sigma skills led to better decision making and problem solving.

Table 2. Empowering front-line

Do you feel that empowering front-line employees with lean six sigma skills has led to better decision-making and problem-solving?	Strongly Agree	Agree	Neutral	Strongly disagree
	69%	21%	7%	3%

The below 2 Tables 3 and 4 highlights the impact felt by respective leader's post implementing lean practices: **86%** Felt that operational performance improved after implementing lean practices and **65%** (Table 5 – Excellent + Very Good) felt increased contribution of front-line employees to operation performance improvement.

Table 3. Operational performance

Have you observed improvements in operational performance after implementing lean practices	Yes	No	Not Sure
	86%	3%	10%

Table 4. Frontline contribution

How would you rate the contribution of front-line employees to operational performance improvement?	Excellent	Very good	Good	Fair
	24%	41%	24%	10%

76% of respondents observed improvements in operational performances after upskilling frontline on lean and implementing visual boards.

Table 5. Implementing Visual Boards

Have you observed improvements in operational performance after upskilling frontline on Lean and implementing visual boards?	Yes	No	Not Sure
	76%	3%	21%

90% of respondents have visual boards either in electronic or physical format (Table 6).

Table 6. Type of visual board

What types of visual boards are used in your organization?	Electronic	Physical boards	None
	79.3%	10.3%	10.3%

The key KPI's that improved (Figure – 3) post implementing visual boards are also interesting, as highlighted by respondents, Cycle Time, Productivity and Error rate reduction are the common once, if we see these are the metrices which are directly associated with the way frontline teams are performing on day-to-day basis. Improvement in these KPIs is testament to the fact that empowering front line has a direct impact on operational metrices.

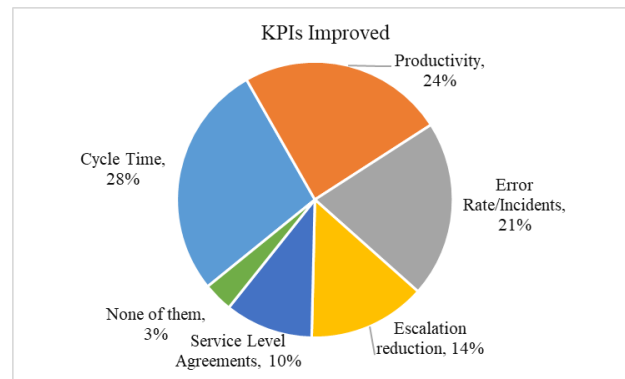


Figure 3. KPIs Improved

The survey and the leader's opinion clearly highlight the fact that there is a considerable improvement in operations observed post adopting lean six sigma, engaging frontline by upskilling them and implementing visual boards. The interesting aspect is irrespective of respondent sectors, the improvement in operational KPIs observed by respondents from all sectors.

Table 7 shows % of respondents agreed that Operational KPIs improved post developing frontline on lean six sigma skill and implementing visual boards.

Table 7. Agreement on Improvement

Sectors	Operational KPI Improved
Audits & Consulting	67%
Core Sector (Manufacturing/Engineering)	100%
ITES/BPO	87%
Shared Services	86%

The survey results provide valuable insights into the role of frontline employees in Lean Six Sigma implementation and the impact of visual boards on operational performance. For instance, 76% of respondents agreed that upskilling frontline employees improved decision-making and problem-solving, while 86% observed enhancements in operational performance. Similarly, 90% of respondents confirmed the use of visual boards to track progress and performance. These findings highlight a strong correlation between engaging frontline employees and achieving organizational objectives.

Limitations - While the survey covered 29 senior leaders from various industries, the sample size may limit the generalizability of the findings. A larger and more diverse sample, incorporating perspectives from frontline employees and mid-level managers, could provide a more comprehensive understanding of the phenomenon.

The absence of advanced statistical analysis, such as regression models or correlation coefficients, limits the ability to quantify the relationships between variables. Incorporating statistical methods in future studies would strengthen the reliability of the findings and offer deeper insights into the causal relationships.

Survey-based research often relies on self-reported data, which may introduce biases such as social desirability or overestimation of success. Triangulating these findings with objective performance metrics, such as error rates, productivity levels, or customer satisfaction scores, could validate the results.

While most respondents highlighted the positive impact of skilling and visual boards, the survey does not account for differing or contradictory perspectives. Future research could include open-ended questions or qualitative interviews to capture diverse viewpoints, including challenges or resistance encountered during implementation. The results are aggregated across different industries, which may obscure sector-specific trends or challenges. Conducting industry-specific analyses could provide tailored recommendations and highlight unique applications of Lean Six Sigma practices.

5.2 Focused group discussion

Discussion with 4 groups comprising of 26 managers from Finance, IT support, HR operations, Procurement to understand the impact on operations developing front-line team on Lean six sigma and implementing visual boards.

The discussion is based on the following areas:

- 1 The driving force behind developing competency in frontlines and focusing on effective performance huddles using visual boards
 - 2 The approach
 - 3 The journey of 4 quarters.
 - 4 The learnings
1. The driving force behind developing competency in frontlines and focusing on effective performance huddles using visual boards:
 - The onus of identifying improvements was with team leaders or managers or the quality team.
 - Any improvement initiative identified missed to achieve its desired goal.
 - Governance around performance metrics and improvement initiatives were less effective.
 - Frontline teams use to take any initiatives taken as push from managers, which eventually lead to partial result from the initiatives.
 2. The approach:
 - Quality team and senior managers came together in March'2023 and drafted a plan on engaging frontline to harness their potential engage them in the process.
 - Developing Waste Eyes was the theme of the workshop which includes concepts and case studies on Process analysis, waste identifications, basic data analysis, understanding Voice of customer, the entire workshop is activity based, which keeps the engagement level high.
 - Key KPIs for team drafted which includes volumetrics, per day productivity, Service level agreements, error count.
 - KPIs are published on huddle boards using Power BI.
 - The huddle/visual boards have key sections that are designed on the concept of OSCRR:
 - O – Objective – The overall team's objective and goals
 - S – Situation – The daily and weekly metrics
 - C – Concerns – The top 3 performance concerns which impacting team's ability to achieve Objective.
 - R – Resolution – Resolved concern are shown in this section.
 - R – Recognition – Key performers, value contributors name displayed in this section.
 - Performance huddle meeting as practice induced in every team, the huddle boards are great motivation source for teams.
 - Kaizen portal developed, so that members can provide improvement ideas and that can be tracked till closure.
 3. The journey of 4 quarters:

As highlighted by managers improvements identified in areas like error count reduction, Request cycle time reduction, manual effort savings by implementing Kaizen's provided by frontline.

Data has been collated to correlate the findings of focused group discussions. The impact of approach initiated in March'2023 can be seen from Quarter-3 of 2023 and post that a gradual improvement is observed, as with time, frontlines matured in driving improvements.

The graphs below demonstrate the impact of performance huddles and lean skilled up frontlines helped in reducing cycle time and reducing error count.

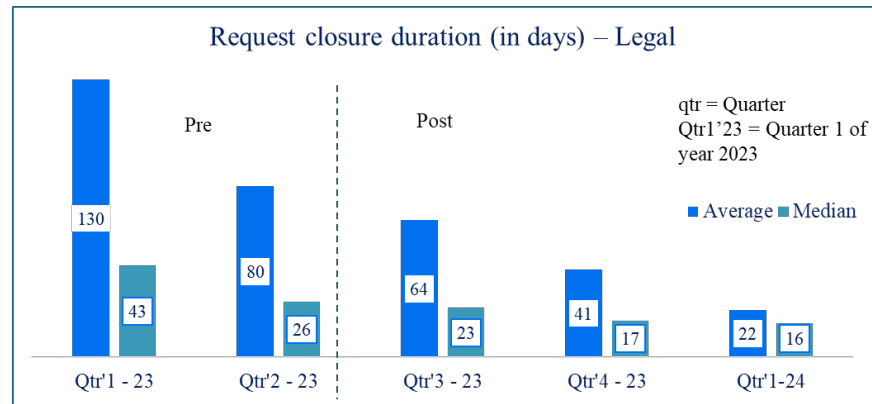


Figure 4. Request closure

Figure 4: highlights impact of empowering front line and implementing visual boards. Legal – Request Closure duration (in days): In Legal operations the time to close request was too long as highlighted in the above graph the average was around 130 days. The key reason identified is low ownership, weak visual governance. By implementing visual boards and initiating performance huddles the problems get surfaced and discussed daily, which eventually triggered a need for improving the situation. The ownership of improvement was taken up by the Lean trained frontlines and eventually a gradual improvement observed.

The results of quarter 1 of 2024 show more than 80% reduction in avg days of Request closure compared to quarter 1 of 2023.

Figure 5: highlights impact of the initiatives in Finance – Error count reduction: In Finance operations the error count in accounts payable was continuously increasing, the concern was repeat errors. One time improvements were also not able to provide sustainable results.

Accounts payable processors, team leads were trained in Lean six sigma through a customized workshops called “Developing the waste eyes”, Visual boards with key performance indicators, implemented.

With time, processors start identifying the key causes and develop sustainable solutions around it, one of human errors were eliminated as processors started to focus on their daily task. Team taken the error count reduction on mission mode as this used to be the key topic of discussion on performance huddles.

The results post Quarter 2 of 2023, shows encouraging response, more than 50% reduction in errors achieved and its continuously improving.

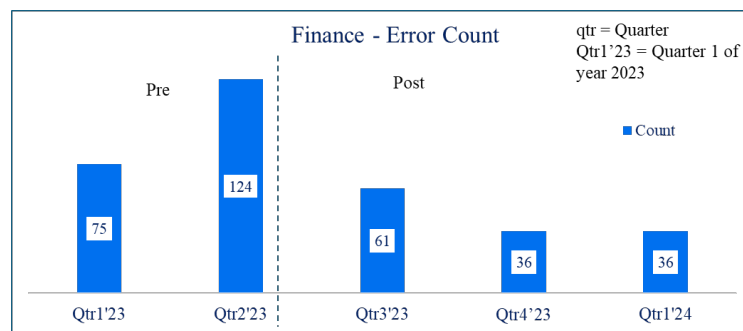


Figure 5. Error Count

From figure 4 and 5 it's pretty evident that the approach taken on 2 functions shown continuous improvement observed in both the functions.

The summary of journeys demonstrated in Figure 6 below:

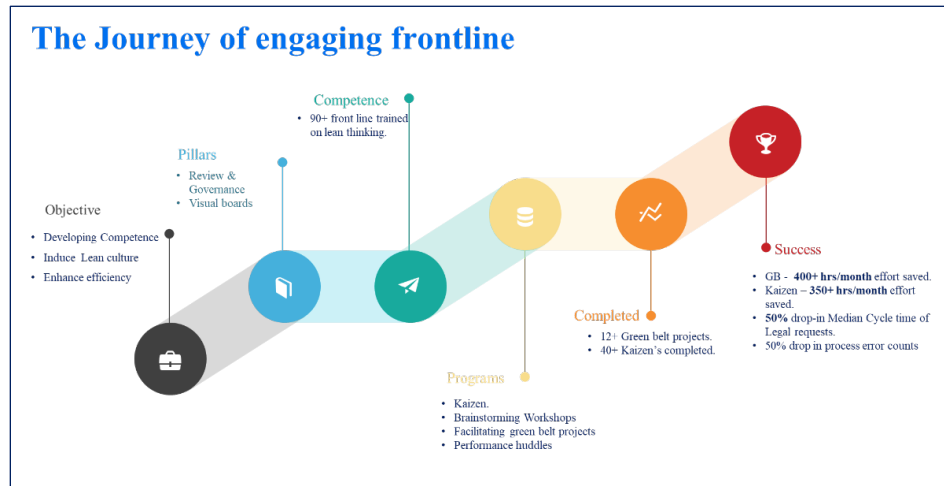


Figure 6. The journey

As discussed, the above started with clear objective, strong pillars of review, governance and visual boards, developed competencies for enhanced engagement. Improvement projects initiated by frontlines categorized as Kaizen or Six sigma green belt, based on its impact and complexity. Eventually success followed in form of manual effort savings, drop-in cycle time, error count reduction.

4. The lessons:

By skilling up the frontline in lean six sigma competencies, developing visual boards and culture of driving performance huddles following changes observed:

- The team is taking accountability of their performance.
- Identification of improvement areas is more frequent and easier
- Initiatives are Team owned, so a feeling of something extra pushed has been marginalized.

The focused group discussions provided valuable insights into the impact of skilling frontline employees in Lean Six Sigma and the implementation of visual boards. Managers from finance, IT support, HR operations, and procurement shared experiences from their respective departments, highlighting challenges and successes. However, a deeper comparative analysis with existing literature and frameworks is essential to contextualize these findings.

The observations that frontline teams were more engaged and took greater ownership of improvement initiatives after skill development align with the findings of Rizzardo (2024) and Needleman et al. (2016), who emphasize the transformative impact of engaging frontline workers.

Unlike most studies that focus on leadership-driven improvement, these discussions reveal the effectiveness of performance huddles and visual boards as bottom-up enablers of Lean Six Sigma. This finding complements frameworks by Fledman (2024) on the role of visual management in real-time decision-making.

While most managers agreed on the benefits of visual boards, some expressed concerns about their initial acceptance among teams. Resistance to change and perceived additional workload were notable barriers. These findings echo barriers highlighted by Wright et al. (2021) in healthcare contexts.

A recurring theme was the positive psychological impact of visual boards on team morale. Managers noted that teams felt a greater sense of achievement and transparency when seeing their contributions visually displayed, an area not extensively covered in existing literature.

5.3 Validation

The validation of our study's findings leverages a robust approach that includes surveys, focused group discussions, and a thorough review of relevant literature. This multi-faceted approach ensures that our insights are not only grounded in empirical data but also resonate with established research in the field.

Empowering Frontline Workers - Our study underscores the importance of empowering frontline workers, a theme strongly echoed by Melanie Schallow (2009), who highlights the necessity of engaging these employees directly to realize continuous improvement goals. The significant improvements in operational efficiency and decision-making capabilities observed in our study align with Schallow's insights, demonstrating that direct engagement enhances the effectiveness of continuous improvement initiatives.

Effectiveness of Visual Boards - The transformative impact of visual boards on communication and problem-solving, documented through our surveys and focus group discussions, is supported by the work of Ken Fledman (2024). He identifies visual management boards as critical for linking and displaying key metrics effectively, thereby facilitating a data-driven culture. Our findings confirm this perspective, revealing that visual boards substantially aid in tracking progress and fostering accountability among teams.

Survey and Focus Group Insights - The surveys and discussions highlighted that after receiving targeted training in Lean Six Sigma methodologies, frontline employees showed a marked improvement in their problem-solving skills and decision-making abilities. These results are validated by 6Sigma.us (2024), which stresses the role of visual tools in promoting transparency and operational excellence.

Case Study Corroboration - Our focused group discussions revealed that training and engaging frontline employees led to tangible improvements in operational metrics such as cycle time and error rates. This is corroborated by the Grossman Group's case study, which demonstrated similar outcomes in employee engagement and operational excellence through frontline involvement.

By integrating these perspectives from the literature, our study not only reaffirms the critical role of frontline employees in Lean Six Sigma initiatives but also provides a validated framework for organizations seeking to enhance operational efficiency through employee empowerment and visual management tools.

6. Conclusion

Based on insights derived from various articles, journals, and authoritative findings, as well as the survey conducted with industry leaders and focused group discussions, it is evident that the active engagement of frontline employees and their upskilling in Lean Six Sigma methodologies significantly contributes to operational gains. These improvements are realized through enhanced process efficiencies, reduced waste, and increased employee ownership of improvement initiatives.

For instance, Valspar's implementation of Rapid Action teams (Rapid action case study) resulted in 59 teams deploying 354 solutions, engaging 325 employees, and achieving \$2.1 million in annualized savings.

However, for these efforts to achieve their full potential, they must be complemented by effective tools and practices that facilitate communication and collaboration. Visual boards, when strategically implemented, serve as dynamic information hubs that enable real-time tracking of key performance indicators and foster transparency across teams. Regular huddles, in turn, provide the platform for addressing challenges, sharing updates, and aligning goals in a structured and timely manner.

Together, this combination of frontline empowerment, Lean Six Sigma training, and robust visual management practices creates a synergistic framework for driving continuous improvement and sustaining operational excellence. Organizations that embrace this holistic approach stand to benefit not only in terms of measurable performance outcomes but also in cultivating a culture of innovation and accountability at every level of their operations.

There are some specific areas which still need to be studied as dynamics are changing very fast, below are some recommendations for further studies:

- **Cross-Industry Comparisons** - Comparative studies across industries, such as healthcare, manufacturing, and IT services, can help identify industry-specific challenges and best practices in frontline engagement and visual management.
- **Integration of Digital Technologies** - Investigate how advancements in digital tools (e.g., AI-powered dashboards, augmented reality visual boards) can enhance the effectiveness of Lean Six Sigma practices.

- Behavioral Impact Analysis - Research on the psychological and behavioral impact of empowering frontline employees, such as increased motivation, job satisfaction, and innovation, could provide a more holistic understanding of the benefits of these interventions.
- Hybrid and Remote Work Settings - With the rise of hybrid and remote work environments, future studies should explore how visual management tools and frontline skilling can be adapted to these contexts while maintaining their effectiveness.

These recommendations not only extend the scope of current research but also aim to provide actionable insights that can be adopted by practitioners in diverse organizational settings.

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