

The Impact of Rewards on Teams and Individual Kaizen Participation

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Abstract

While some Kaizen programs have a minimum requirement for participation, the majority depend on voluntary employee participation to generate continuous improvement ideas; however, organizations often struggle to sustain engagement over time. Although some studies have examined motivation and incentive systems in continuous improvement contexts, empirical evidence on how the winning of rewards impacts the actual Kaizen participation at the individual and team levels remains limited. This study investigates the impact of winning rewards on employee participation in a Kaizen program using a before-and-after research design. Drawing on organizational data, we analyze changes in Kaizen participation levels before and after awarding a reward. Unlike survey-based studies, this research relies on observed participation behavior, enabling a direct assessment of engagement responses to incentives. Results indicate a short-term increase in participation at the team level (largest in the first month after recognition) and a modest, less persistent effect for individual winners. In addition, the awards were associated with an incremental 55 Kaizen submissions over a five-month span, supporting the financial feasibility of the incentive program based on historical time-savings estimates. The results provide insight into whether rewards effectively improve Kaizen participation and how participation patterns evolve following their awarding. By studying the impact of the awards, this study contributes to the literature on continuous improvement and employee motivation. The study findings also offer practical implications for managers and lean practitioners by providing data-backed insights on one of the factors most considered to improve the kaizen program.

Keywords

Kaizen, Lean, Continuous Improvement, Employee Incentives, Recognition

1. Introduction

Lean management most often includes an element of Kaizen (continuous improvement) as a core component of modern operational excellence programs. Originating from the Toyota Production System (TPS), Kaizen promotes small, frequent improvements driven by frontline employees. Although many organizations adopt Kaizen to improve quality and reduce waste, a persistent challenge is sustaining employee participation over time. Firms often use recognition (sometimes including formal awards) to encourage engagement. Still, there is surprisingly little empirical

evidence documenting whether winning such awards actually increases subsequent Kaizen activity and whether the effect carries over to the winner's team.

This paper addresses three central questions:

Q1: What is the effect of winning a Kaizen award on the subsequent submission behavior of the individual winner?

Q2: Does a winner's award influence the Kaizen activity of their teammates (the manager's team)?

Q3: Are the award-associated changes in Kaizen submissions large enough to justify the reward program economically (i.e., do benefits outweigh award costs)?

We answer these questions using administrative Kaizen and awards data from an industry partner, applying an event-study framework based on award announcement months.

1.1 Objectives

- Quantify changes in Kaizen submissions for winners in symmetric event windows (from ± 1 month to ± 5 months) around the award month.
- Measure team-level effects by aggregating employees' pre/post averages to the supervisor level.
- Compute submission volumes (monthly sums) and cumulative activity and test for persistence.
- Estimate baseline activity (12 months pre-award) to normalize treatment effects.
- Provide simple cost-benefit calculations comparing award costs to estimated additional submissions and (where available) recorded savings.

2. Literature Review

Kaizen is usually considered as an organization-wide philosophy of continuous, incremental improvement done by employees at all levels (Imai, 1986). Within Lean management, employee participation is a key enabler of continuous improvement and the generation of ideas (Womack et al., 1990). Because Lean implementation has both a technical and social aspect, organizations frequently face a participation challenge: engagement can surge during early initiatives but decline once novelty fades or when reinforcement is weak (Shah and Ward, 2007). As a result, reward and recognition systems have become a great tool to improve participation in such programs.

Prior research across Lean literature generally supports the idea that incentive drives participation; however, to be effective, they should be aligned with the corporate Lean objectives. Related work shows that recognition and non-monetary incentives can help reinforce continuous improvement involvement and support Lean implementation by sustaining motivation beyond short-term performance pressure (Alves et al., 2009). In addition, implementation guidance in Lean construction considers incentives and resources as important success factors for transformation (Arbulu and Zabelle, 2006). More recent studies also suggest that structured recognition combined with proper communication and digital systems can improve Lean engagement and adherence in operational settings (McKie et al., 2024). Table 1 summarizes the key literature informing this study and highlights common themes regarding incentive design, recognition mechanisms, and sustained participation in Lean and Kaizen programs.

An important differentiation in the literature is the distinction between individual versus team-based rewards and their behavioral side effects. Studies in Lean software development indicate that individual incentives can unintentionally promote local optimization and opportunistic behavior, whereas team-based incentives can better support collaboration and information sharing (Blau et al., 2013). This aligns with broader motivation theory, which suggests that extrinsic rewards can either support or undermine sustained engagement depending on how they are perceived (Ryan and Deci, 2000). These findings are particularly relevant in Kaizen programs, where many improvements are cross-functional and depend on shared learning rather than isolated individual output, as seen in Yokoten in lean terminology.

Accordingly, this study contributes by addressing a key gap: it evaluates the impact of rewards using quantitative data rather than opinions, enabling a behavioral and quantitative assessment of changes in participation for both winners and their teams. This complements prior work by moving from "what people say motivates them" to "what people do after recognition," providing evidence that can better inform recognition and incentive design and help continuous-improvement leadership in their decisions.

Table 1. Relevant Literature

Article Title	Citation	Incentives / Rewards and Lean or Kaizen Participation Summary
Developing Incentive Strategies for Implementation of Lean Construction	Alarcón and Seguel (2002)	Argues that incentive systems are essential for motivating participation in Lean initiatives. Misaligned incentives undermine collaboration, while aligned incentives encourage continuous improvement behavior.
Incentives and Innovation to Sustain Lean Construction Implementation	Alves et al. (2009)	Shows that non-monetary incentives and recognition mechanisms support sustained Lean engagement. Incentives reinforce continuous improvement behaviors rather than short-term output.
Steering through Incentives in Large-Scale Lean Software Development	Hildenbrand et al. (2011)	Demonstrates that incentive design directly shapes behavior. Individual incentives promote opportunistic behavior, while team-based incentives foster collaboration, information sharing, and Lean-aligned participation.
Improving Lean Engagement through Utilizing Improved Communication, Recognition and Digitalization	McKie et al. (2024)	Finds that structured recognition and feedback mechanisms increase Lean engagement and Kaizen activity, with measurable increases in improvement ideas.
Kaizen Award in Romania: The KAIZEN™ Way in Obtaining Continuous Improvement Success	Bratu and Răduțu (2017)	Shows that Kaizen awards legitimize continuous improvement efforts, strengthen motivation, and increase employee participation by signaling management commitment.
From Successful to Sustainable Lean Production – The Case of a Lean Prize Award Winner	Poksinska and Swartling (2018)	Finds that recognition through Lean awards supports sustainability of Lean initiatives, reinforcing desired behaviors when combined with leadership and learning systems.
Bumpy Road to Lean Enterprise	Kajdan (2008)	Identifies lack of recognition and reinforcement as a reason Lean initiatives lose momentum, leading to declining employee participation.
Factors and Barriers Influencing Lean Production System Adoption	Chan et al. (2019)	Identifies incompatible incentive structures as a key barrier to Lean participation. Lean initiatives require rewards that reinforce improvement behaviors.
Implementation Barriers to Lean-Agile Manufacturing Systems	Narkhede et al. (2020)	Highlights the absence of incentive mechanisms as contributing to employee resistance, suggesting incentives help motivate Lean engagement.
Implementing Lean in Construction: How to Succeed	Arbulu and Zabelle (2006)	Argues that recognition and incentive mechanisms are essential to successful Lean implementation, with non-monetary recognition particularly effective.
The Role of Culture in Implementing Lean Production System	Wong (2007)	Shows that short-term incentives may be needed early in Lean implementation but should gradually fade as continuous improvement culture matures.
Advancing Equity: Lean Leader Practices and a Path Forward	Hung et al. (2025)	Emphasizes leadership practices and daily management systems that reinforce engagement. Recognition is implicit through visibility and accountability rather than explicit rewards.

3. Methods

This study employs a before-and-after event-study design to evaluate the impact of Kaizen awards on participation behavior at both the individual and team levels. The award announcement month is treated as the intervention point, and Kaizen submission activity is observed within symmetric event windows surrounding this date. By using observed submission records rather than self-reported measures, the analysis captures actual behavioral responses to recognition.

For each award event, Kaizen submissions are aligned relative to the award month and aggregated into monthly time intervals. Event windows extending up to five months before and after the award are constructed to examine both short-term and medium-term participation dynamics. Two complementary measures of participation are used. First, monthly submission counts capture the number of Kaizen ideas submitted in each relative month. Second, cumulative submission measures aggregate activity across multiple months (e.g., one to five months before or after the award), allowing assessment of persistence and sustained engagement.

Analyses are conducted at two primary levels. At the individual level, participation is measured using Kaizen submissions made by the award recipient before and after receiving a reward. At the team level, participation is measured using submissions from employees reporting to the award recipient's supervisor; team outcomes are computed both as total submission volumes and as averages across team members to account for differences in team size.

In addition to these primary analyses, results are also summarized at the level of the Toyota Lean Management (TLM) representative for internal program evaluation purposes.

To evaluate behavioral persistence, correlation analyses are conducted between pre-award and post-award participation measures using both Pearson and Spearman correlation coefficients. Pearson correlations assess linear associations in submission volumes, while Spearman correlations capture rank-based persistence and are robust to skewness and outliers commonly present in count data. Comparisons are performed for equivalent pre- and post-award intervals (e.g., one month before versus one month after, and cumulative three-month before versus cumulative three-month after).

4. Data Collection

The company's Kaizen program is grounded in the philosophy of continuous improvement and provides associates with a structured platform to submit improvement ideas. As a leading manufacturer of forklifts and material-handling equipment, the organization has embedded Kaizen into daily operations; since the program's inception in 2006, more than 160,000 improvement suggestions have been submitted. To encourage engagement and recognize contributions, the program includes monthly, ergonomic, milestone, departmental, and personal achievement awards. These awards differ in their selection mechanisms and frequency but share a common goal of recognizing Kaizen participation and contribution.

The analysis in this study focuses exclusively on office-based Kaizen submissions. Office Kaizens differ from shop-floor Kaizens in terms of implementation scope, timelines, and participation dynamics. Restricting the analysis to office submissions improves comparability across observations and reduces heterogeneity associated with production-floor operational constraints.

The data used in this study were obtained from three primary internal sources. The first source was a Kaizen award tracking system maintained by the TPS team, which records monthly award winners and documents the award process. The second source was the internal Kaizen submission portal, through which employees submit improvement ideas and track their implementation status. The third source was an internal SharePoint repository used to announce award recipients; the announcement date was used as the reference point for aligning pre- and post-award participation.

The dataset spans a three-year period from January 2023 through September 2025, during which a Kaizen award was granted on a monthly basis, resulting in 32 potential award events. After validating the data and excluding observations with incomplete or inconsistent information, 26 award events were retained for analysis. Each award event serves as a treatment anchor, with the award announcement month defined as the publication month. The Kaizen award is a

fixed cash incentive with a constant dollar value across recipients. When expressed in labor-time equivalents, the award corresponds to approximately three to five hours of work, depending on the recipient's hourly pay rate.

For each award event, Kaizen submission records were extracted for both the individual award recipient and the employees reporting to the recipient's supervisor. Submission activity was observed within symmetric event windows of up to five months before and after the award month. Each Kaizen record includes metadata such as submission date, employee identifier, supervisor, department, and recorded savings, enabling aggregation at the individual, team, and award-category levels.

To establish a pre-award baseline, the average monthly Kaizen participation rate for each award recipient was calculated using submission data from the twelve months preceding the award. This baseline measure allows post-award changes in participation to be interpreted relative to the recipient's historical level of engagement rather than in absolute terms.

5. Results and Discussion

5.1 Numerical Results

Table 2 summarizes the cumulative changes in Kaizen participation within winners' teams following award recognition. The results show a substantial short-term increase in participation, followed by a rapid decline over time. In the first post-award month, cumulative Kaizen submissions increased by 22 submissions, corresponding to an 18.6% increase relative to the pre-award period. When participation is examined over longer cumulative windows, the magnitude of this increase decreases markedly. The cumulative increase falls to 8.2% after two months and 3.0% after three months, and becomes negligible (0.2%) after four months. These results indicate that the impact of awards on team-level Kaizen participation is strongest immediately after recognition and diminishes as the time since the award increases.

Table 2. Cumulative Change in Kaizen Participation in Winners' Teams

Comparison Period (Months)	Cumulative Difference in Kaizen Submissions	Percentage Change
1 Month	22	18.64%
2 Months	20	8.26%
3 Months	11	3.01%
4 Months	1	0.21%
5 Months	28	4.86%

Table 3 shows the cumulative differences in Kaizen submissions following award recognition across increasing post-award time windows for the winners themselves. The results show a modest short-term increase in participation, followed by a consistent decline as the evaluation horizon expands. In the first cumulative post-award month, Kaizen submissions increased by 3 submissions, corresponding to a 12.5% increase relative to the pre-award period; however, this initial gain does not persist. When the cumulative window is extended, participation falls below pre-award levels, with submissions decreasing by 4 submissions (−7.7%) after two months. The decline becomes more pronounced over longer periods, with cumulative reductions of 20 submissions (−22.7%) after three months, 19 submissions (−17.4%) after four months, and 28 submissions (−20.7%) after five months. Overall, these results indicate that award recognition generates, at most, a brief increase in Kaizen participation, which is quickly offset over time, suggesting a limited and short-lived impact on sustained engagement.

Table 3. Cumulative Change in Kaizen Participation in Winners

Comparison Period (Months)	Difference in Kaizen Submissions	Percentage Change
1 Month	3	12.50
2 Months	-4	-7.69
3 Months	-20	-22.73
4 Months	-19	-17.43
5 Months	-28	-20.74

To address Q3 (economic justification), we translate the observed increase in Kaizen activity into labor-time savings and compare it to the cost of the award program. Based on a previous internal study conducted by the authors, the median savings per Kaizen was estimated at 4.2 hours. Using the incremental-impact approach from this study, the awards were associated with an additional 55 Kaizen submissions, distributed over a five-month post-award span. This corresponds to an estimated 231 hours of savings (55×4.2 hours). In comparison, the award cost consists of 32 fixed cash awards; expressed as labor-time equivalents, each award corresponds to roughly 3–5 hours depending on the recipient's pay rate, or approximately 96–160 hours total across 32 awards. Therefore, the estimated incremental savings (231 hours) exceed the total award cost in labor-time terms, indicating the award program is financially feasible and economically justified, under the assumption that post-award Kaizens deliver savings comparable to the historical median.

5.2 Graphical Results

The above results can be presented graphically by plotting the average number of Kaizen submissions per month on the y-axis and the relative time period (months before and after the award) on the x-axis. Figure 1 illustrates this trend for the individual award recipients, while Figure 2 presents the corresponding trend for the winners' teams. In both figures, post-award activity is compared with a baseline defined as each winner's average monthly submissions over the 12 months preceding the award.

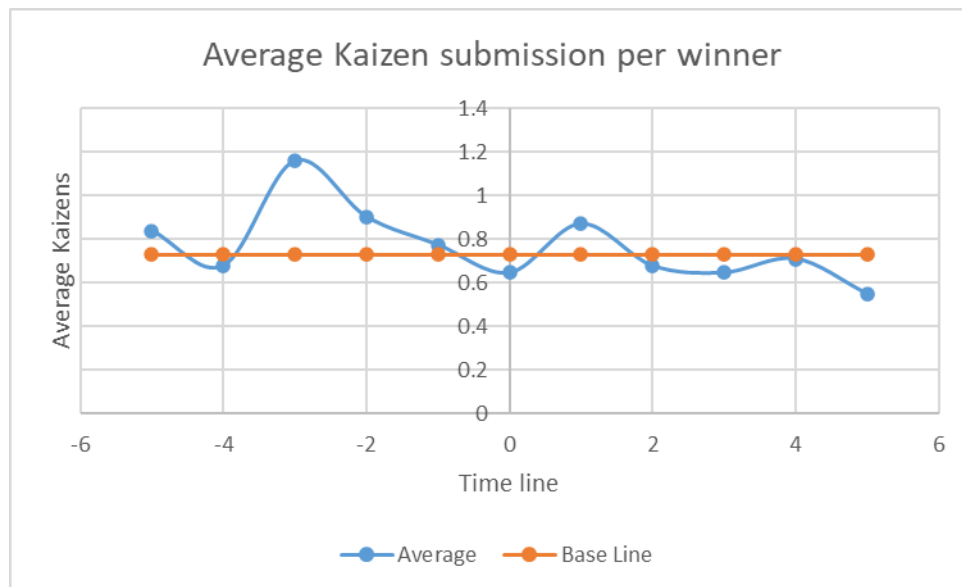


Figure 1. Monthly Kaizen submissions for award recipients relative to the award month

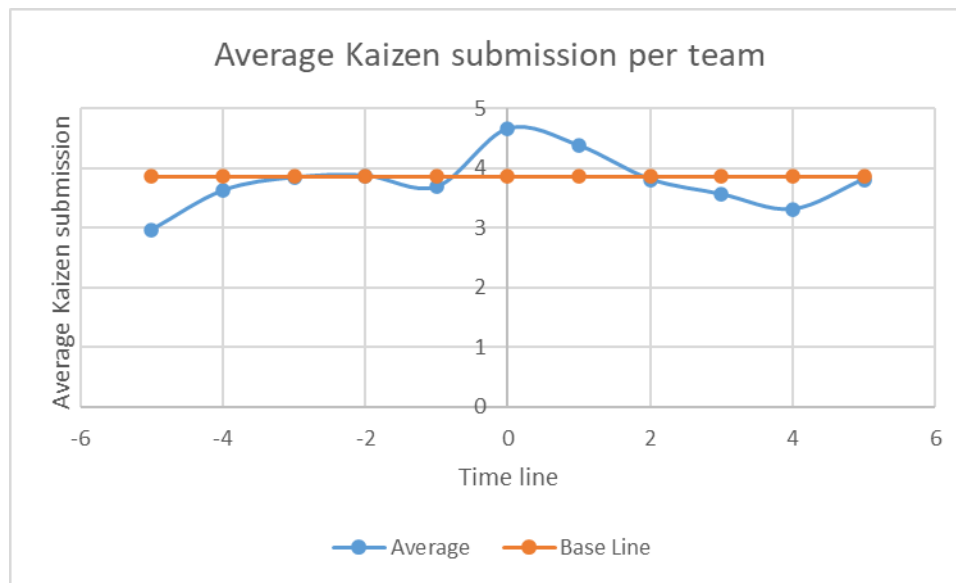


Figure 2 Monthly Kaizen submissions for winners' team relative to the award month

5.3 Discussion

Tables 2 and 3 show that award recognition is associated with a clear short-term participation lift, but the effect is not sustained. At the team level, participation increases strongly in the first month (+22 submissions; +18.6%) and then declines quickly, becoming nearly negligible by month four (+0.2%). At the individual level, winners show only a small initial increase (+3; +12.5%) that reverses over longer windows, with cumulative participation dropping below pre-award levels (down to -20.7% by five months). In addition, internal program observations indicate that a noticeable spike in individual activity can occur approximately three months before the award because recipients are typically informed in advance and may become more engaged while participating in ceremony planning and related recognition activities. Taken together, these findings suggest awards primarily function as a temporary team-level stimulus rather than a mechanism that produces sustained increases in the winner's own submission behavior. From an economic standpoint, the incremental 55 additional Kaizens over five months imply an estimated 231 hours of savings, which exceeds the labor-time equivalent cost of 32 fixed cash awards (~96–160 hours). This supports the conclusion that the award program is financially justified, assuming post-award Kaizens deliver savings comparable to the historical median.

5.4 Proposed Improvements

This study could be strengthened by incorporating additional data points to improve statistical power and overall significance. More advanced statistical analyses could further enhance the robustness of the results and support clearer interpretation. In addition, future analyses should consider evaluating the individual winner's participation using an event window that begins approximately three months prior to the award, since winners are often informed in advance and may increase engagement while participating in recognition and ceremony planning. Including a broader set of contextual attributes would also enable a deeper understanding of the program's impact, such as whether the recognition ceremony was held online or in person, who attended (e.g., the full team versus select members), and whether management was present.

6. Conclusion

This research demonstrates that incentives are an effective mechanism for increasing participation in lean programs, specifically in Kaizen submissions. While the direct impact of incentives on individual winners is modest, the collective effect at the team level is substantially greater, reinforcing the importance of team-based recognition.

Considering a median savings of approximately four hours per Kaizen, investing in employee awards is financially justified and aligned with organizational efficiency goals.

All research objectives were successfully met, including quantifying changes in Kaizen participation, evaluating the differential impact at individual versus team levels, and assessing the economic justification of incentive programs. A key and unique contribution of this study lies in its exclusive reliance on factual, operational data rather than opinions, perceptions, or survey-based responses. The results are entirely quantitative, providing objective and reproducible evidence of the relationship between incentives and lean engagement.

By grounding the analysis in real performance data, this study offers actionable insights for organizational leaders, enabling data-driven decision-making regarding incentive structures and continuous improvement strategies. The findings not only validate the strategic value of rewards in Kaizen programs but also establish a rigorous analytical foundation for future research in lean management systems.

While this study highlights the positive role of awards in influencing Kaizen participation, it is recognized that incentives operate within a broader organizational context. Participation levels may also be shaped by factors such as workload conditions, leadership emphasis, communication practices, and ongoing improvement initiatives. Nevertheless, the observed participation patterns suggest that recognition serves as a meaningful contributor to engagement within the continuous improvement system.

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