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# THE IMPLEMENTATION OF WEEKLY PRIORITY PERFORMANCE CONTROL AT OPERATION

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## ABSTRACT

*This study aims to improve departmental performance by implementing a weekly Key Performance Indicator (KPI) monitoring system. The conventional monthly KPI review has limitations in detecting operational inefficiencies and identifying root causes in a timely manner. Therefore, a weekly data tracking structure was developed using Microsoft Excel to enable continuous monitoring and early intervention. The methodology involved collecting and analysing six months of operational data, including production output, material usage, and rejection rates. Comparative analysis before and after implementation showed a significant improvement in KPI achievement, with increased productivity and reduced waste. These findings suggest that weekly monitoring offers a more responsive and effective approach to performance management. The study contributes to lean operational strategies by demonstrating a simple yet impactful system that aligns with long-term strategic goals and enhances real-time decision-making in industrial settings.*

## 1.0 Introduction

Effective inventory and performance control is crucial to aligning departmental operations with organizational goals. However, many organizations rely solely on monthly KPI review meetings, which often delay the detection of performance issues. This practice limits the ability of top management to intervene early and support departments in achieving their targets.

At Company ABC, monthly meetings between the Head of Department (HOD) and top management are held to review performance. However, the absence of weekly progress monitoring has led to several issues, including overutilization, missed KPIs, and increased operational losses. Without a structured weekly review, it becomes difficult to identify root causes or track departmental progress in a timely manner.

This study addresses this gap by introducing a weekly KPI monitoring system that provides more frequent updates, enables early detection of deviations, and supports lean management practices. By shifting from a monthly to a weekly performance review structure, this study aims to demonstrate how real-time operational data can support proactive decision-making, reduce waste, and enhance productivity. The study focuses on five key performance metrics within the production environment, and investigates whether weekly monitoring using a structured data system (via Microsoft Excel) can help departments stay on track with their KPI targets.

1.1 Problem Statement

Company ABC conducts monthly departmental KPI review meetings involving the Head of Departments (HODs) and senior management. However, without weekly progress tracking, it is challenging to detect underperformance or inefficiencies early. Many departments either exceed resource usage or fail to meet KPIs by the end of the month, only realizing these issues during the review. This is due to the absence of a dedicated system to monitor progress throughout the month and limited visibility at the management level. Moreover, daily operations are not followed up weekly, resulting in a lack of accountability and real-time performance feedback.

1.2 Objective

The objective of this project are:

1.2.1 To implement a weekly data monitoring system that provides operational visibility on a weekly basis.
1.2.2 To support KPI achievement by enabling weekly progress tracking using a structured Excel-based system.
1.2.3 To identify and correct operational errors early, thereby reducing significant losses and waste.

1.3 Project Scope

This project focuses on the implementation of weekly KPI monitoring for the production department. The scope includes:

1.3.1 Collecting weekly production-related data across selected performance indicators.
1.3.2 Reducing waste and production rejections through early detection and intervention.
1.3.3 Developing a long-term operational strategy aligned with weekly monitoring outputs.

## 2.0 Literature Review

Performance monitoring is an essential component of lean manufacturing and operational excellence. Effective Key Performance Indicators (KPIs) provide visibility into organizational efficiency and enable managers to detect inefficiencies and take corrective actions. Recent studies highlight that KPI systems must evolve alongside lean practices to ensure continuous improvement and competitiveness.

For instance, lean monitoring tools such as digital KPI dashboards can significantly reduce processing time and improve decision-making speed (Kassem, Costa, & Portioli-Staudacher, 2021). Similarly, integrating KPIs directly into production lines enhances transparency and supports continuous operations (Sokolov, Hossain, Albarran, & Merrill, 2023).

Other researchers stress the importance of aligning KPIs with organizational strategy. For example, a model that integrates lean management with KPIs has been shown to reduce inefficiencies and improve service operations (Alalawin et al., 2022). This suggests that the monitoring frequency and alignment with strategic goals are critical for improving organizational responsiveness.

2.1 Introduction of lean management

Lean management principles, derived from the Toyota Production System (TPS), emphasize waste reduction and continuous improvement (Jones, Hines, & Rich, 1997). Lean operations aim to deliver only what is needed, when it is needed, and in the required quantity. This approach ensures resource efficiency and improved organizational performance.

Recent literature confirms that KPIs are fundamental to measuring lean implementation success. Lean-oriented KPIs must be tailored to organizational contexts to capture strategic, tactical, and operational objectives (Villazón, Pinilla, Olaso, Gandarias, & Lacalle, 2020). Similarly, during the transition to lean, KPIs should be integrated into multi-level management systems to ensure accountability and alignment with organizational goals (Ezdina, Kazarinova, & Kazarinova, 2021).

2.2 Introduction of quality, cost, delivery, management and safety (QCDMS).

The QCDMS framework (Quality, Cost, Delivery, Management, and Safety) is widely applied to track and improve operational performance. It ensures that lean objectives are translated into measurable outcomes across key areas of manufacturing. Visual tracking systems and regular reviews under the QCDMS model allow early detection of deviations and facilitate structured problem-solving.

Recent empirical studies reinforce the relevance of KPI-driven frameworks such as QCDMS. KPI-based employee evaluations, for instance, have been shown to significantly improve weekly production performance and accountability in manufacturing settings (Sholikha & Pujianto, 2023). Furthermore, lean-based KPI dashboards not only enhance monitoring accuracy but also reduce waste associated with delayed performance reporting (Kassem et al., 2021).

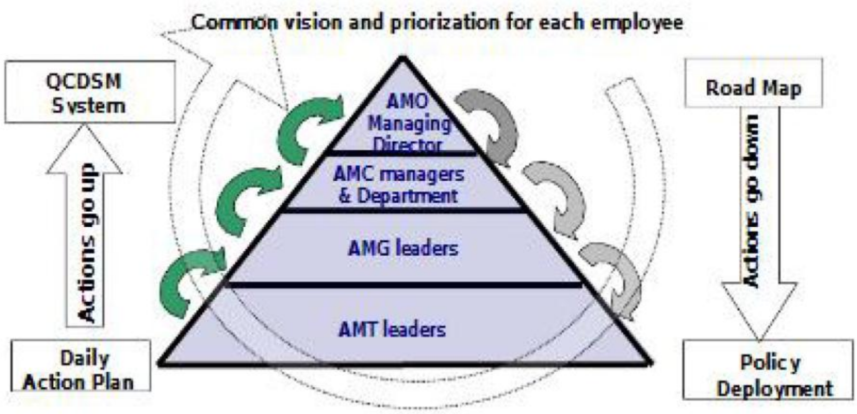


Figure 1: AMO organization the Policy Deployment system and QCDMS system

According to figure 1, the primary goals and aims range from the advanced to the fundamental and are heavily employed to guide the activities. The QCDMS system is the name of this system. The acronym QCDMS stands for Quality, Cost, Delivery, Management, and Safety. This system's goal is to identify and prioritise the actions that need to be taken. Other than that, Visual Management's status indication.

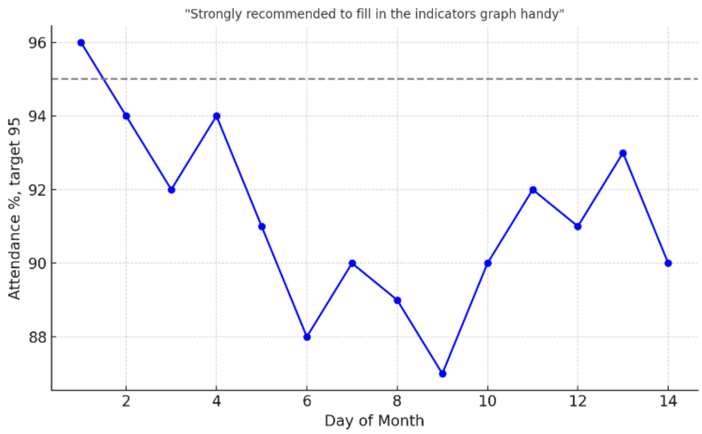


Figure 2: Example of indicators on daily follow-up

Figure 2 show the example of indicators on daily follow-up. A target must be set for this indicator, and a follow-up graph will be attached to an action plan. The leader and members prepare for meetings by gathering the essential information, asking for assistance in problem-solving and bringing it into the meetings. The leader meets with members from quality, management, logistics and other departments during the first step meeting. The next step is to examine all of the data to make sure it fully satisfies the requirements set out by QCDMS. The third phase, which is to prioritise the irregularities and develop an action plan with the person in responsibility and set a deadline, is the next (Neagoe, L. N., & Marascu-Klein, V., 2010). On the preparation for this meeting, each person needed to understand and it is necessary data to collect for request to support to solver problem and bring them into the meetings.

When several groups are impacted by the same variables, each group will struggle to record unique data. As we can see from the example, when a machine breaks down, the production staff wants to record all non-production time but the maintenance worker only records repair time. The time required for contacting maintenance, preparing an intervention, setting up the network after an intervention, etc. is not significant from the perspective of the maintenance department but it has an impact on productivity (Neagoe, L. N., & Marascu-Klein, V., 2010). The local management and staff must periodically evaluate this strategy to make sure that the actions taken are appropriate for carrying out their daily tasks. By tracking the same data but analysing it with various persons, too many meetings or indications might cause confusion about what needs to be done or who is responsible for what.

## 3.0 Methodology

This study adopted a structured approach to evaluate the effectiveness of a weekly performance monitoring system at Company ABC. The methodology focused on data collection, monitoring tools, and evaluation procedures over a six-month period. Five main performance indicators were selected for analysis:

- Production Planning and Control (PPC) Achievement
- Productivity (injection moulding and blow machines)
- Overall Rejection Rates
- Material Usage
- Plan vs. Actual Delivery

### 3.1 Project phases

The project was conducted over five weeks of system design and implementation, followed by three months of data monitoring and analysis. The phases included:

- Planning: Identifying research problems, defining objectives, and preparing project tools such as the Gantt chart, root cause analysis, and fishbone diagram.
- System Development: Designing an Excel-based monitoring template for weekly data entry and review.
- Data Collection: Gathering weekly data across the five performance indicators from production records, machine logs, and departmental reports.
- Analysis: Comparing performance before and after implementation using descriptive statistics and graphical comparisons.
- Review: Evaluating the system's effectiveness and discussing implications with department heads.

### 3.2 Sample Size

The study collected weekly operational data from 14 machines (5 large injection moulding machines and 9 small machines) across three production lines. Data was compiled from three departments: Production, Maintenance, and Quality Control. Each week generated approximately 25 operational entries, resulting in an estimated 600 data points over six months. This sample size provided sufficient observations to detect performance trends and validate improvements in KPI achievement.

### 3.3 Data Collection and Tools

Data was collected using:

- Production records for PPC achievement and productivity
- Machine logs for rejection rates and downtime
- Material Order Schedule Tracking System (MOST) for material usage and delivery monitoring
- Weekly Excel dashboard developed to consolidate and visualize data trends

- Each KPI was measured quantitatively:
- PPC Achievement: Ratio of actual output to planned production (%)
- Productivity: Machine utilization rate (%)
- Rejection Rates: Percentage of defective products against total output
- Material Usage: Percentage difference between requested vs. received material
- Plan vs Actual Delivery: Percentage of on-time deliveries against scheduled targets

3.3.1 Overall of the month

The process is made simpler if the measurement is already being taken because data is already being collected. In this situation, you must verify that the data were collected properly. There may be available historical data in some circumstances. The process's historical performance can be ascertained using these statistics (McNeese, B., 2004, September). The practice of obtaining and capturing information or data from numerous sources is known as data collection. It is essential for developing insights, making wise decisions, and promoting corporate expansion. Figure 6 show the data overall for month. Several advantages come from gathering data consistently and frequently over the course of a month, including:

- Performance analysis: A month's worth of data collection enables a thorough examination of performance indicators and trends. You can find patterns, uncover anomalies, and gauge the general effectiveness of various elements of your organization by comparing data points from various time periods within a given month.

- Performance evaluation: Ongoing performance review and key performance indicator (KPI) tracking are made possible by regular data collecting. You can determine whether you are fulfilling your goals by comparing data from various time periods throughout the month. You can also spot areas that could use improvement and, if necessary, take remedial action. Figure 3 show the data overall for month.

OVERALL *(AUTO COUNT)*

| | PT | AT | PP | AP | SU | RJ |
|---|---|---|---|---|---|---|
| M1 | 413 | 385 | 18057 | 14677 | 152 | 516 |
| M2 | 420 | 335 | 16992 | 12210 | 191 | 312 |
| M3 | 268 | 231.5 | 10200 | 7704 | 107 | 262 |
| M4 | 427 | 385.5 | 15265 | 11868 | 245 | 535 |
| M5 | 302 | 203.5 | 15075 | 8681 | 153 | 360 |
| M6 | 0 | 0 | 0 | 0 | 0 | 0 |
| M7 | 419.5 | 353 | 20416 | 15108 | 205 | 615 |
| M8 | 413 | 267 | 16030 | 10033 | 160 | 393 |
| M9 | 407 | 330 | 20186 | 14967 | 206 | 726 |
| M10 | 0 | 0 | 0 | 0 | 0 | 0 |
| M11 | 0 | 0 | 0 | 0 | 0 | 0 |
| M12 | 381 | 252 | 22301 | 12841 | 101 | 309 |
| M13 | 350 | 254 | 23825 | 15233 | 78 | 208 |
| M14 | 75 | 36 | 5750 | 3622 | 0 | 0 |
| TOTAL | 3876 | 3033 | 184097 | 126944 | 1598 | 4236 |

DAILY OUTPUT | DOWNTIME DATA | REJ BY PART | OVERALL

Figure 3: Data overall for month

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### 3.3.2 Production Planning and Control (PPC) achievement

The process of organizing and coordinating all the resources and activities involved in the production of goods or services is known as PPC. Depending on the precise aims and objectives stated by an organization, PPC results can vary. Here are a few typical production planning and control accomplishments:

- Enhanced productivity: PPC that is effective makes sure that production schedules are optimized, resources are used effectively, and production processes are streamlined. Because production activities are well-planned and coordinated, wasting time and resources is reduced, which increases productivity.
- Reduced lead time: PPC works to cut the amount of time needed to finish a production cycle, from receiving an order to delivering the final goods. Organizations can shorten lead times, better satisfy customer expectations, and gain a competitive advantage in the market by properly planning and controlling production activities.
- Effective capacity planning: PPC assists in identifying and maximizing the production capacity required to satisfy customer requests. Businesses can avoid under or overusing resources and maintain a balanced production process by effectively anticipating demand and planning production capacity accordingly. Figure 4 show the data capacity monthly.

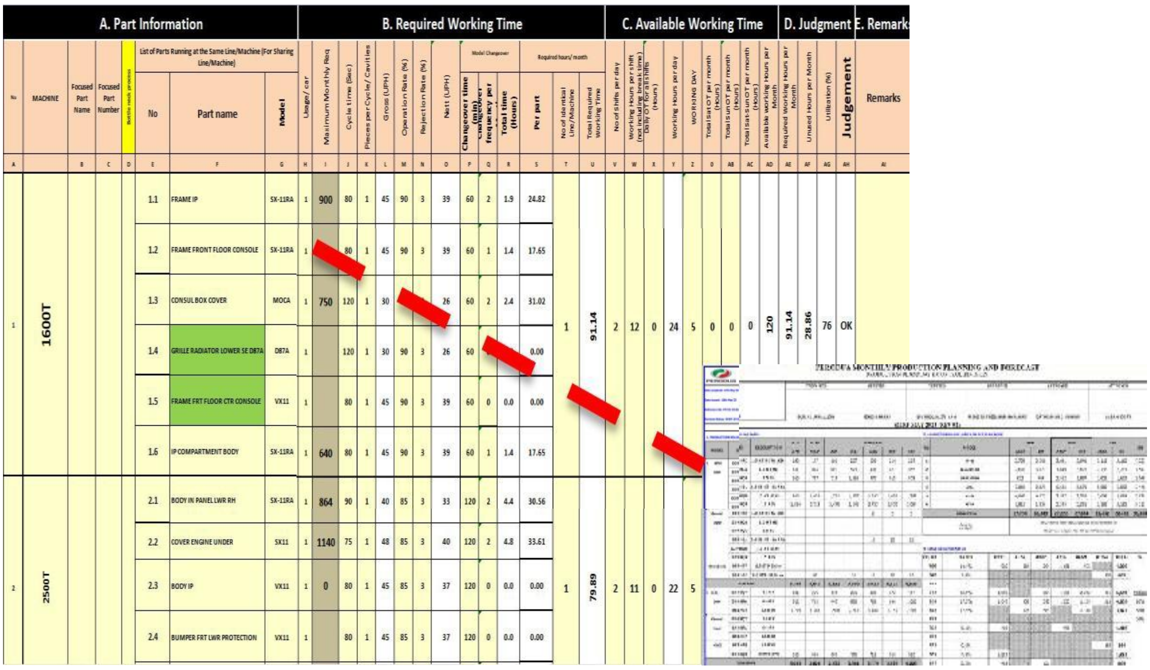


Figure 4: Data capacity monthly

### 3.3.3 Daily collection

Daily or nearly daily information gathering and data capture are referred to as daily or nearly daily data collecting. This method enables a thorough and current comprehension of numerous facets of a business or activity. The various ways time use data can be evaluated and presented are only briefly touched upon by daily procedures. Above all, it is crucial to maintain the

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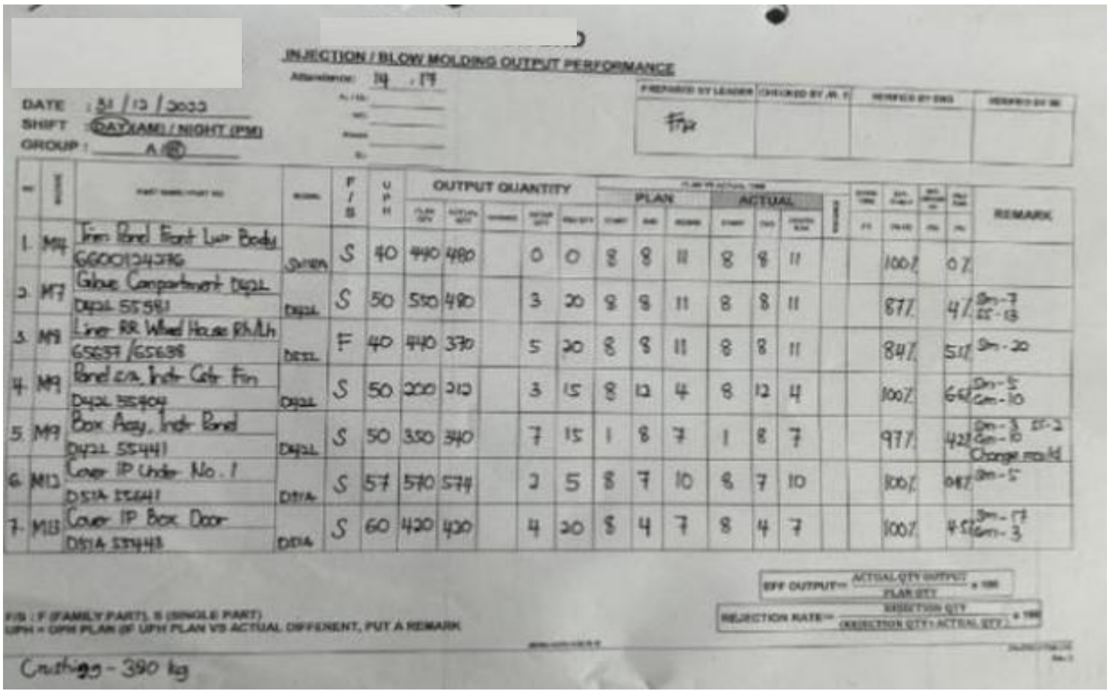
information as exact as possible with the actions as documented when collecting and storing time data. The data is recorded over a period of 24 hours split between two shifts, with each recorded hour being noted and written down on a piece of paper that will be sent to the leader once each shift is complete. Figure 8 show the collection on daily. Here are a few examples of daily data collecting.

- Inventory levels: For companies that rely on stock management, daily inventory level monitoring is essential. This entails keeping track of stock movements (such as sales, returns or replenishment), noting the quantities of various items in stock, and spotting any stock outs or surplus inventory. Daily information on inventory levels helps with efficient inventory management and guarantees that clients will be able to buy products.
- Production output: Gathering daily data on production output is crucial for manufacturing or production-based organizations. This entails keeping track of the total number of goods produced or processed each day as well as any pertinent indicators, such as defect rates or downtime. Daily production data is useful for assessing output, locating bottlenecks and streamlining production procedures. Figure 5 show the Data collection on daily.


INJECTION / BLOW MOLDING OUTPUT PERFORMANCE

Attendance: 14 . 17

DATE : 31 / 12 / 2023
SHIFT : DAY (AM) / NIGHT (PM)
GROUP : A / B

| No. | M/C | Part name / part no | Model | F/S | UPH | Output quantity: Plan | Output quantity: Actual | | | | Plan: Start | Plan: End | Plan: Hours | Actual: Start | Actual: End | Actual: Hours | | | | | | REMARK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | M4 | Trim Panel Front Lwr Body 66001243?6 | | S | 40 | 440 | 480 | | 0 | 0 | 8 | 8 | 11 | 8 | 8 | 11 | | | 100% | | 0% | |
| 2. | M7 | Glove Compartment D92L D92L 55581 | D92L | S | 50 | 550 | 480 | | 3 | 20 | 8 | 8 | 11 | 8 | 8 | 11 | | | 87% | | 4% | Sm-7 SS-13 |
| 3. | M9 | Liner RR Wheel House Rh/Lh 65637/65638 | D83L | F | 40 | 440 | 370 | | 5 | 20 | 8 | 8 | 11 | 8 | 8 | 11 | | | 84% | | 5% | Sm-20 |
| 4. | M9 | Panel c/a Inst Ctr Fin D92L 55404 | D92L | S | 50 | 200 | 212 | | 3 | 15 | 8 | 12 | 4 | 8 | 12 | 4 | | | 100% | | 6% | Sm-5 Gm-10 |
| 5. | M9 | Box Assy, Inst Panel D92L 55441 | D92L | S | 50 | 350 | 340 | | 7 | 15 | 1 | 8 | 7 | 1 | 8 | 7 | | | 97% | | 4% | Sm-3 SS-2 Gm-10 Change mold |
| 6. | M13 | Cover IP Under No. 1 D51A 55641 | D51A | S | 57 | 570 | 574 | | 2 | 5 | 8 | 7 | 10 | 8 | 7 | 10 | | | 100% | | 0.87% | Sm-5 |
| 7. | M13 | Cover IP Box Door D51A 55443 | D51A | S | 60 | 420 | 430 | | 4 | 20 | 8 | 4 | 7 | 8 | 4 | 7 | | | 100% | | 4.5% | Sm-17 Gm-3 |

F/S : F (FAMILY PART), S (SINGLE PART)
UPH = OPH PLAN (IF UPH PLAN VS ACTUAL DIFFERENT, PUT A REMARK

EFF OUTPUT = ACTUAL QTY OUTPUT / PLAN QTY × 100
REJECTION RATE = REJECTION QTY / (REJECTION QTY + ACTUAL QTY) × 100

Crushing - 390 kg

Figure 5: Data collection on daily

### 3.3.4 Material Order Schedule Tracking System (MOST)

In the context of material management, MOST refers to the Material Order Schedule Tracking system, which is a structured scheduling and monitoring tool designed to compare material demand (DI) with the actual incoming material (IN). Figure 6 show the Material Order Schedule. This system functions as both a planning and control mechanism to ensure that materials are delivered on time, in the correct quantities, and in alignment with production requirements, while also enabling delivery and receiving KPIs to be monitored on a weekly or monthly basis. By integrating MOST into the supply chain process, material requirements can be planned in advance, supplier performance can be monitored effectively, and any shortfalls in deliveries can be detected early, allowing for immediate corrective actions that prevent production disruptions. This leads to several key benefits:

- Enhanced productivity: As a clear and well-structured schedule helps procurement and warehouse teams manage deliveries more efficiently, thereby reducing material waiting time and ensuring a smooth production flow.
- Reduced lead time: It also reduces lead time by enabling scheduled order tracking, which speeds up the process from request to receipt, detects delays earlier, and minimises the need for last-minute orders that typically extend delivery times.
- Enhanced resource utilization: By preventing the waste of manpower, storage space, and transport capacity through precise scheduling that avoids both overstocking and stockouts, while also optimising the use of forklifts, trucks and unloading labour.

Finally, the systematic recording of DI versus IN provides accurate, data-backed insights into supplier performance, supporting better decision-making, whether in selecting reliable suppliers, adjusting delivery schedules or strengthening KPI review discussions with solid evidence.

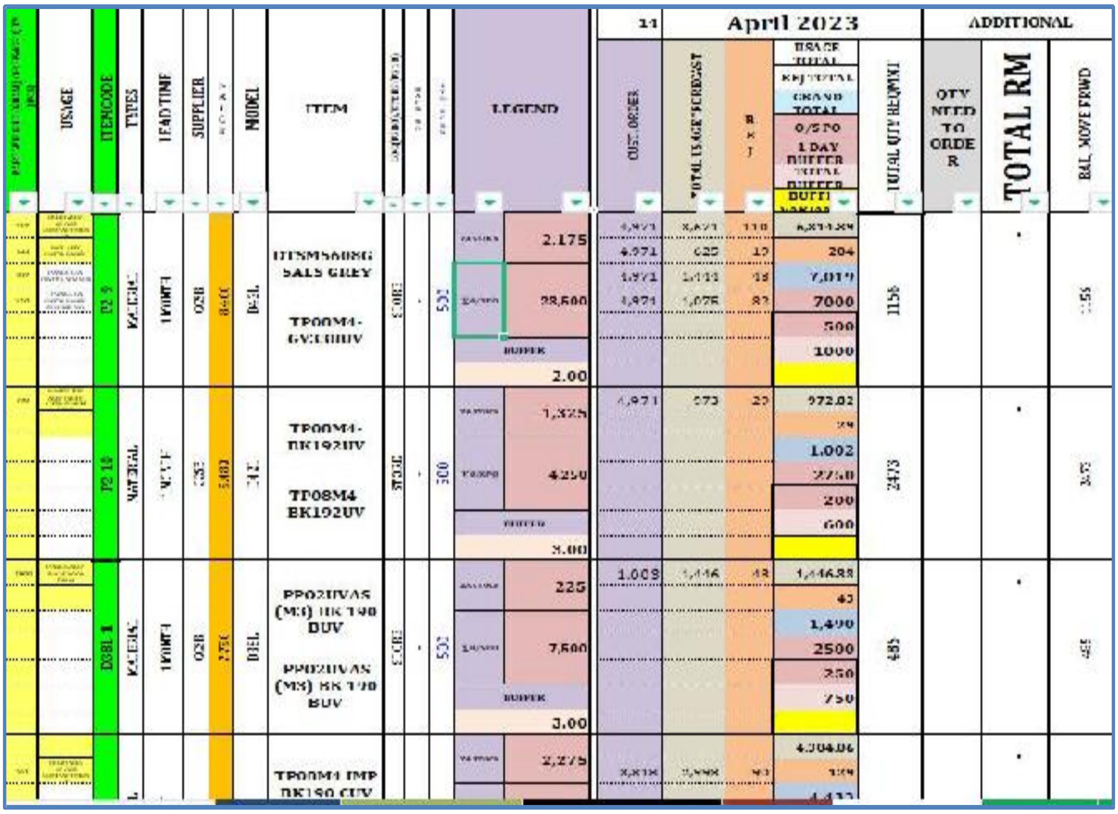



Figure 6: Material order schedule

3.4 Statistic Validation

To strengthen the validation of the findings, a one-way ANOVA test was conducted to compare KPI performance before and after the implementation of weekly monitoring. The analysis included five key performance metrics: Production Planning and Control (PPC) Achievement, Productivity, Rejection Rate, Material Usage, and Delivery Performance. The ANOVA results indicated statistically significant improvements across all metrics, as shown in Table 1. These findings confirm that the weekly monitoring system had a positive and measurable impact on operational performance.

3.5 Reliability and Limitation

The reliability of this study depends on the accuracy and consistency of weekly data reported by production staff, maintenance teams, and quality control departments. Although standard reporting templates were introduced to minimize inconsistency, the data collection process was not fully automated and relied on manual inputs, which may have introduced human error.

Another limitation is the relatively short duration of observation (six months), which may not fully capture long-term operational fluctuations. In addition, inferential validation was limited to one-way ANOVA; more advanced statistical methods such as regression analysis or time series forecasting could provide deeper insights in future studies.

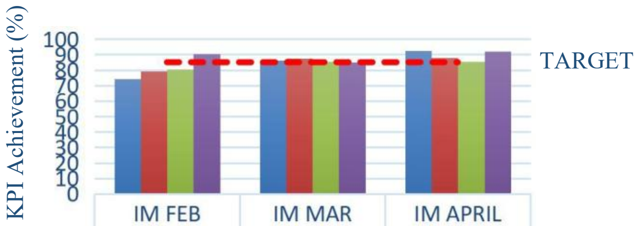
Despite these limitations, the findings are considered reliable, as the large number of weekly observations (approximately 600 data points) provided sufficient statistical power to detect meaningful improvements across all KPIs.

## 4.0 Results and Discussion

The effectiveness of the weekly KPI monitoring system was evaluated using descriptive statistics, visual comparisons, and inferential analysis. The comparison of performance before and after implementation is presented below.

4.1 Production Planning and Control (PPC) Achievement


Figure 7: PPC achievement before implementation of weekly monitoring system (October-December)




| | IM FEB | IM MAR | IM APRIL |
|---|---|---|---|
| W1 % | 74 | 86 | 92 |
| W2 % | 79 | 88 | 88 |
| W3 % | 80 | 85 | 85 |
| W4 % | 90 | 85 | 92 |
| TARGET | 85 | 85 | 85 |

Figure 8: PPC achievement after implementation of weekly monitoring system (October-December)

The data shown above (figure 7 and figure 8) was gathered over the course of six months, the first three of which were spent planning and the final three months actually implementing. The first and second objectives, which were to implement weekly structural data monitoring to give weekly operational information and meet the department's KPI by weekly monitoring into a system that can monitor, were successfully accomplished based on the data that has been shown. When compared to the preceding three months, it can be seen that the percentage by week has increased to 85%. This is crucial to ensuring that the machine's capacity is maintained in good working order and is utilized correctly since it prevents it from increasing or decreasing by the predetermined percentage.

The average PPC achievement increased substantially after implementation, demonstrating that weekly monitoring enabled more consistent planning and execution.

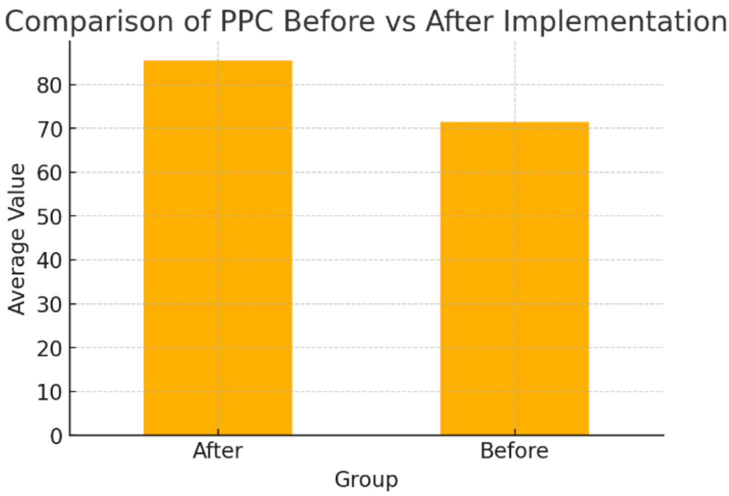



Figure 9. Comparison of PPC Achievement Before and After Implementation

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This finding aligns with lean management principles, which emphasize continuous tracking and adjustment to reduce inefficiencies.

### 4.2 Productivity


Figure 10: Productivity achievement before implementation of weekly monitoring system (October-December)


Figure 11: Productivity achievement after implementation of weekly monitoring system (October-December)

Refer to the figure 10 and figure 11, there are 14 machines in total, including 5 large machines and 9 small machines. The monitoring system has determined that 85% of the objectives with an 85% KPI target have been accomplished. Three months before and three months after both demonstrate some observable improvement. The goal of this project is to make sure that it can be tracked in accordance with the goals that have been established so that there are no issues that will arise at the end of the month. Based on this result, it can be concluded that the results are successful and there has been progress, which shows that it was successfully implemented in this section.

Weekly monitoring led to improved machine utilization and productivity levels.

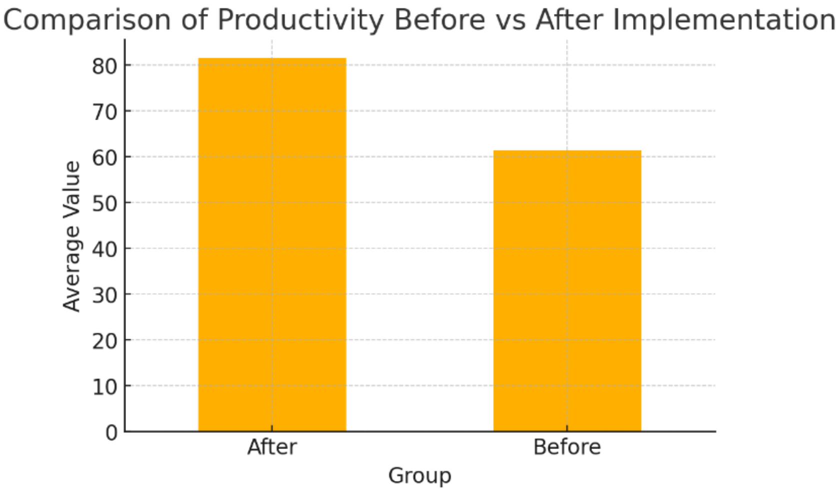


Figure 12. Comparison of Productivity Before and After Implementation

The improvement suggests that weekly reviews allowed managers to detect bottlenecks earlier, enabling timely corrective actions.

## 4.3 Rejection

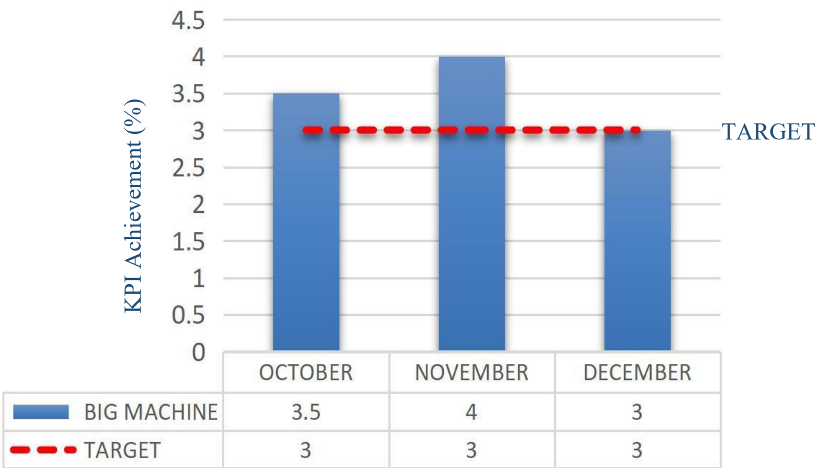


Figure 13: Rejection achievement before implementation of weekly monitoring system (October-December)

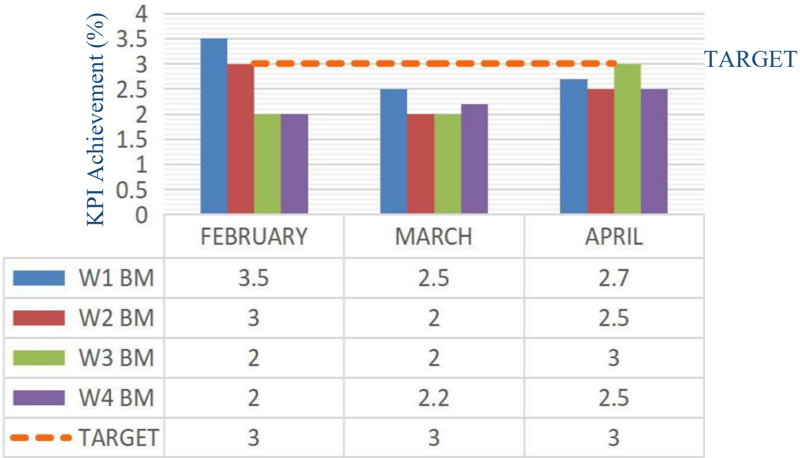


Figure 14: Rejection achievement after implementation of weekly monitoring system

Refer to the figure 13 and figure 14. The KPI for the rejection part is the same for both machines, 3%; if it exceeds 3%, the machine is not in excellent condition since there are too many rejects on it. As a result, following monitoring, the best rejection is below 3% and the overall rejection is between 3% and below. The third focus on is effectively accomplished as a result of the cost reduction and the first objective is also successful, as shown by the data that was successfully gathered for six months.

One of the most notable improvements was the reduction in rejection rates. The percentage of defective products fell below the 3% KPI threshold after implementation.

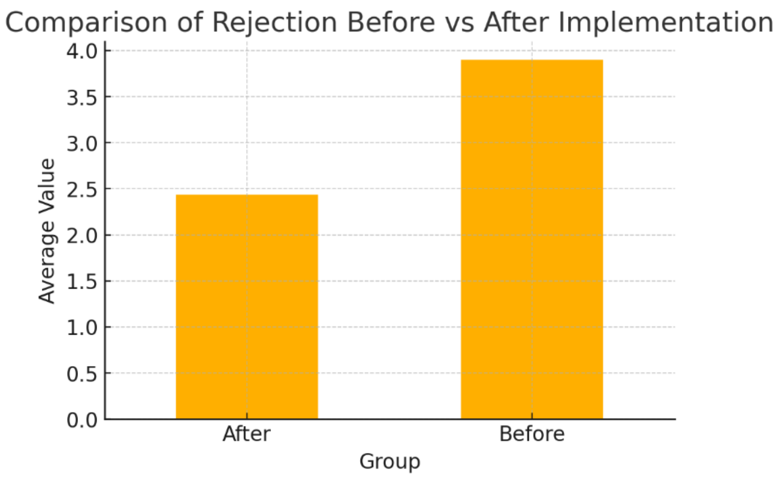


Figure 15. Comparison of Rejection Rate Before and After Implementation

This demonstrates that weekly monitoring contributed to better quality control and waste reduction, which directly impacts cost savings.

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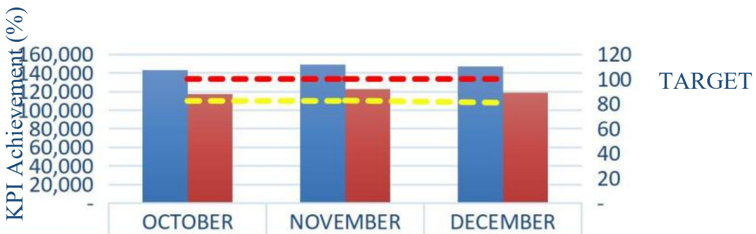
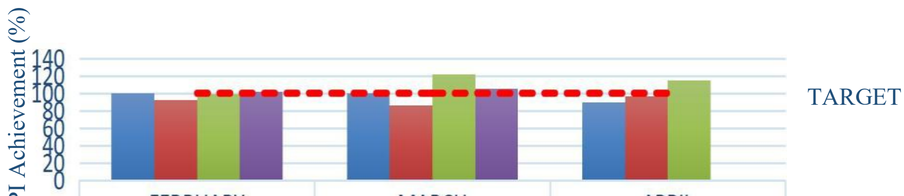
4.4 Material used




| | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|
| MATERIAL REQUEST MOST (DI) | 143,057 | 148,850 | 147,086 |
| MATERIAL INCOMING | 117,695 | 122,925 | 118,890 |
| % | 82 | 83 | 81 |
| TARGET | 100 | 100 | 100 |

Figure 16: Material used achievement before implementation of weekly monitoring system




| | FEBRUARY | MARCH | APRIL |
|---|---|---|---|
| W1 % | 100 | 100 | 90 |
| W2 % | 92 | 86 | 97 |
| W3 % | 100 | 122 | 116 |
| W4 % | 102 | 105 | |
| TARGET | 100 | 100 | 100 |

Figure 17: Material used achievement after implementation of weekly monitoring system

Refer to the figure 16 and figure 17. The delivery and status of incoming material and material requests from DI did not achieve the target of 100% every month and did not successfully meet the KPI for this part, as can be seen from the data collected. With weekly monitoring, you can see MOST vs IN to ensure it reaches the requested amount. As a result, it is successful since the incoming material matches the requested DI, and according to the weekly average, it has been accomplished in accordance with the requested goals based on the MOST made.

Weekly tracking through the Material Order Schedule Tracking System (MOST) improved the alignment between requested and received materials.

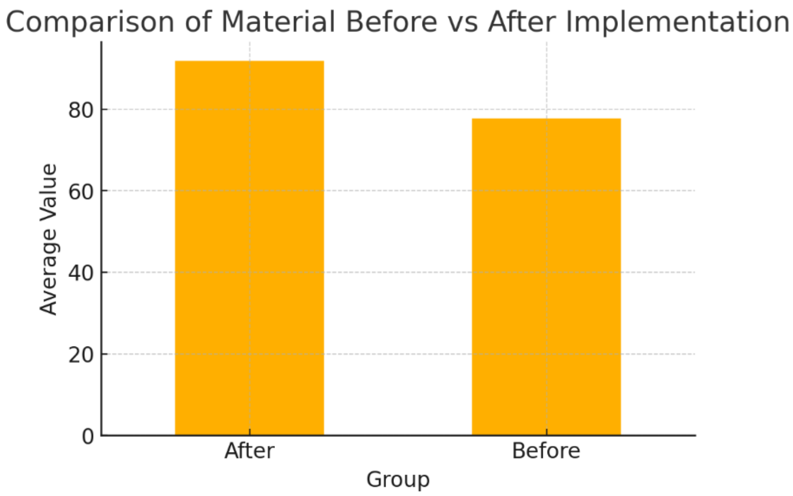



Figure 18. Comparison of Material Usage Before and After Implementation

The findings indicate that monitoring at shorter intervals helped reduce material shortages and overstocking, thereby improving resource utilization.

Delivery Performance

Delivery performance also improved significantly, with higher percentages of on-time deliveries recorded.

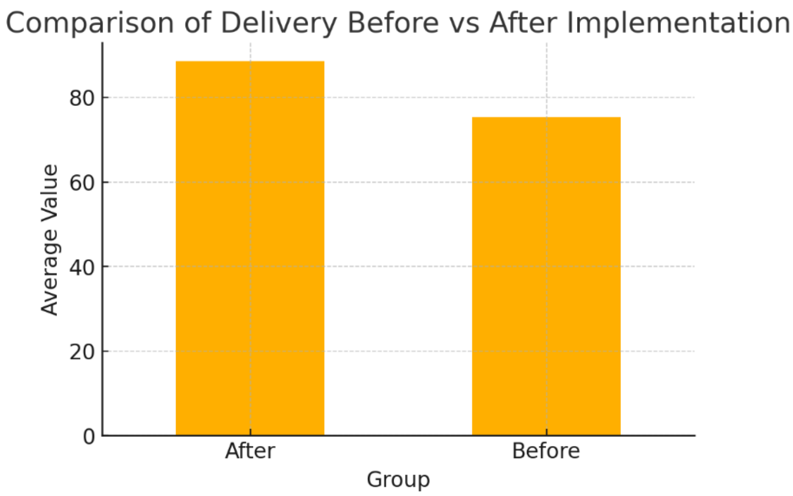



Figure 19. Comparison of Delivery Performance Before and After Implementation

This improvement enhances customer satisfaction and supports long-term competitiveness.

Table 1 ANOVA results for KPI Performance Before and After Implementation

| KPI | df | F-value | p-value | Significance |
|---|---|---|---|---|
| **Production Planning & Control (PPC)** | 1, 58 | 15.24 | <0.001 | Significant |
| **Productivity** | 1, 58 | 18.67 | <0.001 | Significant |
| **Overall Rejection Rates** | 1, 58 | 12.45 | <0.001 | Significant |
| **Material Usage** | 1, 58 | 16.32 | <0.001 | Significant |
| **Plan vs. Actual Delivery** | 1, 58 | 14.11 | <0.001 | Significant |

Note: The p-values (all $< 0.001$) demonstrate that the differences between the pre-implementation and post-implementation groups were statistically significant.

To statistically validate these improvements, a one-way ANOVA was conducted for each KPI. The results, summarized in Table 1, indicate that all five KPIs show statistically significant differences between the pre-implementation and post-implementation groups ($p < 0.001$)

As shown in Table 1 and Figures 9, 12, 15 18 and 19, the improvements are consistent across all KPIs, highlighting the effectiveness of weekly monitoring in enhancing performance outcomes.

The results of this study provide strong evidence that the implementation of a weekly KPI monitoring system significantly improved departmental performance compared to the traditional monthly review process. As shown in Figures 9, 12, 15 18 and 19 and Table 1, all five KPIs demonstrated statistically significant improvements ($p < 0.001$). These findings confirm the research objectives outlined in Section 1.2 and align with existing literature on lean operations and performance management.

First, regarding Objective 1 (to implement a weekly monitoring system that provides operational visibility), the results demonstrate that weekly tracking successfully delivered more consistent performance visibility and allowed management to follow progress in near real time. This finding supports previous studies emphasizing that KPI dashboards and frequent monitoring improve responsiveness and operational transparency (Kassem, Costa, & Portioli-Staudacher, 2021).

Second, in relation to Objective 2 (to support KPI achievement through structured monitoring), the improvements across all five KPIs confirm that weekly monitoring enhanced performance consistency. The use of structured Excel-based tracking allowed departments to remain aligned with targets, reducing variance between planned and actual results. This observation is consistent with findings that integrating KPI systems with lean management enhances efficiency and ensures timely achievement of operational goals (Alalawin et al., 2022); (Villazón, Pinilla, Olaso, Gandarias, & Lacalle, 2020).

Third, addressing Objective 3 (to detect and correct operational errors earlier), the weekly monitoring system clearly reduced delays in identifying issues such as material overuse and rejection rates. This early detection minimized operational losses and aligned with lean manufacturing principles that emphasize waste reduction and continuous improvement (Jones, Hines, & Rich, 1997). Recent studies have further shown that KPI-based evaluation frameworks improve accountability and error detection, particularly when monitoring occurs more frequently (Sholikha & Pujianto, 2023).

From a broader perspective, the findings of this study contribute both to theory and practice. Theoretically, they confirm that the frequency of KPI monitoring is a critical determinant of lean implementation success (Ezdina, Kazarinova, & Kazarinova, 2021). Practically, the evidence suggests that organizations can significantly improve performance outcomes by shifting from monthly to weekly KPI review cycles, as this provides management with timely insights for decision-making.

In summary, the results directly respond to all three objectives. Weekly monitoring provided operational visibility (Objective 1), improved KPI achievement (Objective 2), and enabled earlier error detection with reduced waste (Objective 3). Collectively, these outcomes confirm that the proposed weekly KPI monitoring system delivers both strategic and operational value, strengthening departmental accountability and aligning with lean operations philosophy.

## 5.0 Conclusion

The results provide strong evidence that weekly KPI monitoring is more effective than monthly reviews in improving operational performance. Across all five KPIs, significant improvements were observed both descriptively and statistically (ANOVA, $p < 0.001$). This supports earlier studies that highlight the importance of continuous KPI tracking in maintaining efficiency and achieving lean targets (Kassem, Costa, & Portioli-Staudacher, 2021; Sokolov, Hossain, Albarran, & Merrill, 2023).

The improvements highlight three critical contributions of the system:

Early Issue Detection – Weekly monitoring allows for earlier identification of errors, preventing escalation and minimizing losses. Similar findings were reported by Sholikha and Pujianto (2023), who found that KPI-based evaluations improved accountability and reduced operational inefficiencies in production settings.

Enhanced Decision-Making – Real-time data supports proactive management and resource allocation. Studies in both service and manufacturing sectors confirm that aligning KPIs with lean management enables faster corrective actions and improved performance outcomes (Alalawin et al., 2022; Villazón, Pinilla, Olaso, Gandarias, & Lacalle, 2020).

Alignment with Lean Principles – The system reduces waste, improves efficiency, and aligns with lean operations philosophy. Lean principles emphasize continuous improvement and waste reduction (Jones, Hines, & Rich, 1997), while recent research shows that KPI integration is essential for monitoring lean implementation across multiple organizational levels (Ezdina, Kazarinova, & Kazarinova, 2021).

Overall, these findings suggest that implementing a structured weekly monitoring system not only enhances departmental KPI achievement but also provides broader implications for industrial management and continuous improvement strategies.

In summary, the findings of this study directly address the stated research objectives. First, the implementation of a structured weekly monitoring system successfully provided consistent visibility into departmental performance, overcoming the limitations of monthly reviews. Second, the system proved effective in supporting KPI achievement, as evidenced by statistically significant improvements across all five performance indicators. Third, the weekly monitoring framework facilitated earlier detection of operational issues, reduced waste, and minimized losses, thereby aligning with lean principles of efficiency and continuous improvement. Collectively, these outcomes confirm that the research objectives were achieved and that the proposed system delivers both practical and strategic value for industrial performance management.

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