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Original Article

Analysis of Production Management at PT Maha Putra Jaya: Challenges and Strategies for Increasing Efficiency

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Abstract

This research aims to analyze production management at PT Maha Putra Jaya with a focus on the challenges faced and strategies to increase efficiency. PT Maha Putra Jaya, as a manufacturing company, faces various issues in its production process, including low machine efficiency, product quality problems, and workforce training needs. The research methods used include interviews with production managers, direct observation on the production floor, and analysis of related documents. Key findings show that machine efficiency is compromised by a lack of preventive maintenance, product quality often does not meet standards due to suboptimal quality control, and employee training is inadequate to support the required skills. The research recommends implementing more stringent preventive maintenance systems, improvements in quality control techniques such as Six Sigma, and the development of more comprehensive training programs. By implementing these strategies, it is hoped that PT Maha Putra Jaya can increase production efficiency and product quality significantly.

Keywords: Employee Training, Machine Efficiency, Production Management, Preventive Maintenance, Quality Control.

1. Introduction

Companies often face issues such as waste, production delays and quality defects that can affect overall operational performance. One of the key challenges is waste reduction, which in this case includes overproduction and excessive lead times. This problem is similar to the findings at CV Marga Jaya, which also experiences significant wastage (Pradana et al., 2018). In addition, the company faced constraints in terms of quality control, where high defect rates required the implementation of an effective quality management system. The lean six sigma approach, which is often used to address quality issues, was one of the solutions adopted, similar to those applied in other studies (Pradana et al., 2018). In the same way, capacity constraints are also an important issue, where PT Maha Putra Jaya faces sub-optimal utilization of production facilities, which can have a direct impact on production efficiency. This is similar to the problem found at PT Girimulya Resource, which also suffers from low capacity utilization (Supriyatna & Okdinawati, 2024).

To improve efficiency, companies are implementing strategies such as lean manufacturing. Lean principles that focus on reducing waste and improving production processes have proven effective in increasing efficiency, as seen in the improvements. The application of this approach seek to reduce waste and improve overall quality and production capacity (Supriyatna & Okdinawati, 2024).

Production management is the key to success in the manufacturing industry. An efficient and effective production process can be a major competitive advantage, affecting not only production costs but also product quality and customer satisfaction (Ohno, 2019). PT Maha Putra Jaya, as a company operating in [mention industrial sector if relevant, for example: textile, automotive, electronics industry], is committed to providing high quality products. However, to achieve this goal, the company must face various challenges in its production process.

Along with technological developments and changes in market needs, PT Maha Putra Jaya must continue to adapt to maintain its competitiveness. Problems that frequently arise in production management include low machine efficiency, quality control problems, and inadequate training requirements for the workforce. These factors can result in increased production costs, decreased product quality, and decreased customer satisfaction, which ultimately has an impact on company performance.

Low engine efficiency, for example, can be caused by a lack of preventative maintenance or suboptimal engine settings (Juran, 1999). Product quality problems often stem from an ineffective quality control system (Alabdullah & Kanaan-Jebna, 2023), which causes product defects and customer dissatisfaction (Kumar & Suresh, 2006). Additionally, a lack of training can result in inadequate employee skills to meet complex and dynamic production challenges.

By considering these challenges, this research aims to analyze production management at PT Maha Putra Jaya. This research will identify the main problems that affect production efficiency and quality and formulate strategies that can be implemented to improve the production process. By understanding the challenges and developing appropriate strategies, it is hoped that companies can increase operational efficiency, reduce costs and increase customer satisfaction.

This research is expected to provide useful insights for production managers and other stakeholders at PT Maha Putra Jaya, as well as being a reference for other companies facing similar challenges in production management.

2. Literature Review

2.1. Production Management

Production management is the process of planning, controlling and supervising the production process to ensure that goods are produced efficiently and effectively. According to Heizer et al. (2020), production management includes various activities including capacity planning, quality control, and supply chain management. This activity aims to maximize productivity and reduce production costs while maintaining product quality. Hence, production management must pay attention to the balance between operational efficiency and set quality standards, so that the company can remain competitive in a dynamic market.

2.2. Production Efficiency

Production efficiency refers to the ability to produce goods with minimal use of resources and in the most efficient time possible. Krajewski et al. (2013) explained that efficiency can be influenced by factors such as machine maintenance, process settings, and the technology used. Implementing a preventive maintenance system and using the latest technology are methods that have proven effective in increasing production efficiency (Juran, 1999). Preventive maintenance serves to minimize sudden breakdowns that can disrupt smooth production, while modern technology can increase speed and accuracy in the production process, which in turn reduces wastage of time and resources.

2.3. Quality Control

Quality control is a process to ensure that the products produced meet established quality standards. Montgomery (2007) suggests that quality control techniques such as Six Sigma and Total Quality Management (TQM) can help companies identify and reduce product defects. Effective quality control not only increases customer satisfaction but also reduces costs associated with product defects and returns. Thus, companies need to integrate these quality control techniques into every stage of production, from raw material procurement to final product packing, to ensure that every product produced meets strict quality requirements.

2.4. Employee Training

Employee training is an important aspect of production management that focuses on developing employee skills and knowledge. Stevenson et al. (2007) notes that good training can increase employee productivity and reduce errors in the production process. An effective training program should cover a variety of aspects, including machine operation, quality control techniques, and safety procedures. In addition, training should also focus on improving employees' interpersonal and communication skills, as good teamwork is essential in complex production processes.

2.5. Challenges in Production Management

Challenges in production management often include issues of machine efficiency, quality control, and employee training. Slack et al. (2010) identified that companies often face problems in maintaining optimal machine performance and maintaining product quality standards. Additionally, deficiencies in employee training can hinder their ability to handle complex production challenges. For that reason, companies must be proactive in identifying and addressing these challenges so that the production process can run smoothly and produce high-quality products.

2.6. Improvement Strategy

Some strategies that can be implemented to improve production management include:

a) Preventive Maintenance: According to Agarwal and Narain (2016) preventive maintenance can reduce machine downtime and increase production efficiency.
b) Quality Control Improvement: Implementation of quality control techniques such as Six Sigma can help in reducing product defects (Montgomery, 2007).
c) Employee Development: Ongoing training programs can improve employee skills and productivity (Steven & Prasetio, 2020).

3. Methods

3.1. Research Design

This study used a descriptive qualitative approach to analyze production management at PT Maha Putra Jaya. This approach was chosen because it allows researchers to explore in depth various aspects of production management, including the challenges faced and strategies that can be implemented to improve efficiency. The descriptive qualitative approach is considered appropriate to gain a deeper understanding of the phenomena that occur in the field, without being limited to quantitative variables alone, so as to provide a more comprehensive picture of the managerial processes that occur in the company.

3.2. Location and Research Subjects

This research was conducted at PT Maha Putra Jaya, a company engaged in the manufacturing sector. The selection of this location was based on the company's relevance to the research topic, which is directly related to the production management to be analyzed. The research subjects consisted of production managers, technical staff, and employees working on the production floor. The selection of subjects was done by considering their roles in the production process and their involvement in decision-making related to production management. This was done so that the information obtained could cover various relevant perspectives in production management in the company.

3.3. Data Collection Techniques

Data was collected using the following techniques:

a) Interviews: Semi-structured interviews were conducted with production managers and technical staff to gain insights into the production process, challenges faced, and strategies implemented. Interviews were conducted face-to-face and recorded for further analysis. This technique allowed the researcher to explore more in-depth information related to factors affecting production management in the company.
b) Observations: Direct observations are conducted on the production floor to assess machine efficiency, quality control procedures, and employee interactions. Observations are carried out on various shifts to get a comprehensive picture of production operations. The observation approach provides important contextual data to understand the dynamics of the field and the application of managerial practices in everyday situations.
c) Documentation: Document analysis involves reviewing production performance reports, machine maintenance records, and quality control reports. This document provides quantitative data about production efficiency and problems that occur. Documentation also helps in verifying data obtained through interviews and observations.

3.4. Data Analysis Techniques

Data obtained from interviews, observations and documentation were analyzed using a thematic approach. Data analysis steps include:

a) Transcription and Coding: Transcription of interview results and observation notes was carried out to facilitate analysis. Data was coded to identify key themes related to production management challenges and strategies.
b) Theme Grouping: The themes that emerged from the data were categorized into major groups such as machine efficiency, quality control, and employee training.
c) Thematic Analysis: Grouped data is analyzed to identify patterns, relationships, and insights that can explain challenges faced and proposed improvement strategies.

3.5. Validity and Reliability

To ensure the validity and reliability of the research, several steps were taken:

a) Data Triangulation: Using multiple data sources (interviews, observations, and documentation) to ensure consistency and accuracy of information. This triangulation aims to strengthen the research findings and reduce potential bias.
b) Data Verification: Interview and observation results are verified by comparing with documentation data to identify and reduce bias. This verification is important to increase the credibility of the data collected.
c) Quality Test: The data analysis process is audited by fellow researchers to ensure the quality and consistency of analysis results. This quality test ensures that the analysis

process is conducted in a systematic and objective manner, resulting in findings that can be accounted for.

With this approach, the research is expected to provide comprehensive insight into production management at PT Maha Putra Jaya and formulate effective strategies to improve production efficiency and quality.

4. Results and Discussion

4.1. Research Result

4.1.1. Machine Efficiency

Machine efficiency at PT Maha Putra Jaya shows that machine operations have not reached the optimal level. Based on observations, frequent machine downtime is caused by the lack of implementation of preventive maintenance and irregular maintenance schedules. Maintenance reports show that about 15% of the total machine operating time is interrupted by preventable damage.

In an interview with one of the senior technicians, Mr. A, it was revealed that maintenance schedules are often not implemented on time due to limited technician manpower and delays in procuring spare parts. *"We already have a maintenance schedule, but in reality, there are so many operational disruptions that we have to deal with emergency problems first. As a result, routine maintenance is often delayed,"* he explains. In addition, another technician, Ms. S, added that management often ignores technicians' reports of repair needs before severe damage occurs. These issues point to the need for improvements in machine maintenance management, including more efficient procurement of spare parts and allocation of sufficient resources to adhere to preventive maintenance schedules.

4.1.2. Quality Control

The quality control process at the company showed inconsistencies in its implementation. Despite the implementation of quality control procedures, the product defect rate reached 8%, exceeding the tolerance limit set by the company. This indicates a weakness in the inspection process that is unable to detect product defects early.

In an interview with the production manager, Mr. H, it was stated that the main factor causing product defects was the lack of training of quality control personnel. *"Most of our quality control staff do not have enough expertise to identify small defects that could affect the final quality of the product. Also, the measuring tools we use are outdated,"* he said. A quality control staff member, Ms. L, added, *"We often have to rely on personal experience because the measuring tools are often inaccurate, so some defects are missed."* Concrete actions are needed, such as the procurement of more modern inspection tools and an intensive training program for quality control staff to improve their ability to detect product defects.

4.1.3. Employee Training

Employee training at PT Maha Putra Jaya is considered inadequate to support the company's operational demands, especially regarding the operation of modern machinery and the implementation of effective quality control procedures. Based on interviews with several employees, many of them feel that they have not received sufficient training.

One of the production operators, Mr. D, stated, *"The new machine that came a few months ago is very different from what we are used to. Unfortunately, we were only given*

training once, and even then it was very short, so we often struggle when there are technical problems."

In addition, a new employee, Ms. R, revealed that she did not receive adequate job orientation. *"I was only given work guidance in the form of documents, without any direct assistance from the supervisor. As a result, I often feel confused when I have to make decisions in the field,"* she said.

This issue shows the importance of planning a structured training program, including technical training for operators and in-depth orientation for new employees. In addition, management could consider a continuous evaluation system to ensure the effectiveness of the training that has been provided.

4.2. Discussion

4.2.1. Challenges in Machine Efficiency

The main challenge in machine efficiency at PT Maha Putra Jaya stems from the lack of planned preventive maintenance implementation and the lack of predictive technology integration. In the view of Heizer et al. (2020), structured preventive maintenance can reduce downtime by up to 30%, increasing efficiency and machine life. Observations show that 15% of total machine operating time is interrupted by preventable breakdowns. These breakdowns often stem from the use of obsolete parts, mechanical component fatigue, and ignoring early signs of damage.

The company's reactive approach, where repairs are only made after a breakdown occurs, not only increases maintenance costs but also significantly affects production flow. This approach results in uncertainty in production schedules, which ultimately affects customer satisfaction and overall operational performance. Further, according to Lee et al. (2020), predictive maintenance based on technologies such as IoT sensors, data analytics, and real-time monitoring can predict breakdowns before they occur, enabling more effective maintenance. The implementation of this kind of technology in similar companies is reported to reduce downtime by 40% and maintenance costs by 25% (Al-Turki et al., 2019). Thus, PT Maha Putra Jaya needs to invest in modern maintenance technology to create sustainable operational efficiency.

Key benefits of a reactive approach include reduced downtime and improved cost efficiency. Structured maintenance helps ensure higher machine availability, while utilization of predictive technologies such as IoT sensors enables real-time data collection for proactive maintenance (Elkateb et al., 2024; Oroy & Anderson, 2024). In addition, predictive maintenance supports sustainability by optimizing resource use and reducing unforeseen breakdowns (Nimma et al., 2024). However, while the benefits are significant, the implementation of these technologies requires a large initial investment and training of human resources. These challenges can be an obstacle, especially for companies with limited budgets or resources. Therefore, companies need to design a well-thought-out implementation strategy to maximize operational efficiency without burdening the existing cost structure.

4.2.2. Challenges in Quality Control

The quality control issues faced by PT Maha Putra Jaya indicated the weak structure and implementation of the quality assurance system. The product defect rate reached 8%, well above the acceptable tolerance, which typically ranges from 2% to 3% in modern manufacturing standards. The data showed that most of the defects occurred in the final stages of production, reflecting less than optimal supervision in the early stages of the production

process. This is due to inconsistent implementation of quality control procedures, lack of modern measuring instruments, as well as reliance on manual inspections that are prone to human error.

In this context, Montgomery (2007) highlights the importance of applying Six Sigma methodology to minimize defects with a data-driven approach. Six Sigma focuses on reducing process variability and improving quality through measurable statistical tools. In addition, the adoption of technologies such as automated optical inspection (AOI) and machine vision systems enables companies to detect defects in the early stages of production with a much higher degree of accuracy than manual inspection (Wang et al., 2019).

With a structured and data-driven approach, Six Sigma minimizes defects through the DMAIC (Define, Measure, Analyse, Improve, Control) cycle which is effective in identifying the root cause of problems and providing sustainable solutions (Monday, 2022). This methodology also utilizes statistical tools to measure and control process variability, so that defect rates can be significantly reduced (Fan, 2024).

The integration of advanced technologies such as automated optical inspection (AOI) and machine vision systems strengthens Six Sigma implementation by improving defect detection accuracy over manual methods. AOI technology enables earlier defect detection, providing opportunities for timely intervention and waste reduction in the production process (Sihombing & Marwan, 2024). Meanwhile, machine vision systems provide high precision in defect identification, which is particularly beneficial in high-risk manufacturing environments (Ghelani, 2023).

But despite the significant benefits it offers, some companies, especially small ones, face challenges in adopting this methodology. Obstacles such as high initial implementation costs and the need for extensive training for employees can be major barriers to the widespread adoption of Six Sigma (Supriyati & Widyatri, 2024).

PT Maha Putra Jaya should also strengthen the competency of its quality assurance team through intensive training in the use of modern measuring instruments and data-based system management. This is in line with Juran's (2010) findings, which state that developing the competence of the quality workforce is key to ensuring compliance with international quality standards.

4.2.3. Employee Training and Skills Development

Employee training and skills development are essential components in improving organizational productivity and job satisfaction. Effective training methodologies include a variety of approaches, such as on-the-job training that allows employees to acquire hands-on skills in a real work environment, which helps them understand their roles better (Kisasilla & Mutarubukwa, 2024). In addition, mentor programs play an important role in skills development and personal guidance, contributing to improved skills and employee satisfaction (Chaudhary & Bhaskar, 2016). The impact of training on organizational performance is seen in increased productivity and decreased employee turnover, which in turn strengthens company performance (Nmadu et al., 2021). In addition, structured training opens up career opportunities by aligning the employee's skills with the needs of the organization, providing benefits to both parties (Nursaumi & Sunarya, 2022). Nevertheless, the effectiveness of training programs must also be aligned with the organization's strategic objectives to align with employee aspirations and business needs, in order to maximize effectiveness (Nmadu et al., 2021). Continuous assessment of training programs is important to ensure that strategies remain relevant and adaptive to changing workforce needs

(Chaudhary & Bhaskar, 2016). While the benefits of employee training are well documented, differences in organizational culture and employee needs emphasize the importance of a customized approach to ensure the success of training and development programs.

The complexity of modern production processes requires a workforce that has adequate technical skills, something that is still a weakness at PT Maha Putra Jaya. Based on interviews with employees, the majority stated that the training provided by the company is inadequate, both in terms of intensity and scope. New employees often do not have adequate orientation on production processes and work safety, while existing employees do not receive advanced training to keep up with technological developments.

According to Stevenson et al. (2007), effective training programs not only improve technical skills but also reduce error rates in the production process by up to 20%. In addition, companies can leverage collaboration with technical training institutions or certification bodies to develop specialized training modules, such as training on automated machine operation and data-driven quality control techniques (Garavan et al., 2021). This training should also include aspects of occupational safety management to reduce the risk of accidents that could disrupt productivity. Research shows that companies that invest more than 1% of their annual revenue in employee training experience productivity gains of up to 15% in the long run (Noe et al., 2015).

4.2.4. Improvement Strategy

To overcome these challenges, PT Maha Putra Jaya needs to adopt a holistic strategy that includes technological innovation, strengthening operational systems, and human resource development. This strategy includes:

1. Preventive and Predictive Maintenance

Integrate IoT-based predictive technologies to detect potential engine failures before they occur. This includes using sensors to monitor temperature, vibration, and the condition of machine components in real-time, which can be integrated into analytics systems to provide insights into maintenance planning (Lee et al., 2020).

2. Quality Control System Improvement

Adopt Six Sigma methodology and automated inspection technology to reduce product defect rates. The implementation of Total Quality Management (TQM) is also important to create a culture of quality throughout the organization (Montgomery, 2013).

3. Continuous Employee Training Program

Develop a comprehensive training program that includes orientation for new employees, advanced technical training, and certification. The program should be designed to meet the company's operational needs, such as training in the use of automated machinery and quality control data analysis (Garavan et al., 2021).

4. Production Process Optimization

Conduct periodic evaluations of production workflows using tools such as value stream mapping to identify and eliminate waste (Stevenson, 2007). Lean manufacturing practices can also be applied to improve operational efficiency..

5. Investment in Industry 4.0 Technology

Implementing Industry 4.0-based technologies, such as integrated production systems and artificial intelligence, to support data-driven decision-making. This move enables PT Maha Putra Jaya to be more adaptive to changes in market demand and improve overall competitiveness.

By implementing this strategy, PT Maha Putra Jaya can create a more efficient production system, consistent product quality, and a more competent workforce. In addition, this approach will give the company a significant competitive advantage, ensure sustainable growth, and proactively address future industry challenges.

5. Conclusion

This research analyzes production management at PT Maha Putra Jaya with a focus on identifying challenges and proposing strategies to improve efficiency. The findings of this study highlighted three main issues: low machine efficiency, ineffective quality control systems, and inadequate employee training. Machine efficiency was compromised by a lack of preventive maintenance and non-optimal machine settings, which led to frequent downtime and lower productivity. The existing quality control system failed to detect product defects in the early stages of the production process, increasing costs and lowering customer satisfaction due to inconsistent product quality. In addition, limited employee training programs hindered the development of skills needed to adapt to technological advancements and improved production procedures, which negatively impacted work quality and production efficiency.

To address these challenges, several strategies are proposed. First, the implementation of a strict preventive maintenance system can reduce machine downtime by proactively identifying and addressing issues through scheduled maintenance and inspections. Second, the improvement of quality control systems through methods such as Six Sigma and Total Quality Management (TQM) can help detect and reduce defects earlier in the process, thus ensuring consistent product quality. Third, improved employee training programs covering the latest production technologies, quality control techniques, and standard operating procedures are essential for skill development and operational efficiency. Fourth, regular evaluation of the production process can identify areas that require improvement and enable the implementation of best practices and modern technology. By adopting these recommendations, PT Maha Putra Jaya can optimize production efficiency, reduce operational costs, and improve product quality. This study provides practical insights to overcome challenges in production management and achieve continuous performance improvement.

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