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A Study on Total Productivity Maintenance Systems in Mahindra Logistics at Salem

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ABSTRACT

The purpose of this study is to examine the advantages of effective total productive maintenance (TPM) programs in competitive manufacturing.Additionally, it looks extensively at how key TPM implementation projects affect an Indian logistics organization. A recently developed method for maintaining machinery and plants is called Total Productive Maintenance (TPM). Implementing the Pillar activities to address breakdown concerns in the industrial sector is the main focus of this study. The logistics industry, where the research is being conducted, is currently having trouble setting up particular machining operations at their facility and keeping it up to date to minimize downtime caused by maintenance. The strategy seeks to determine the fundamental cause of the problems that result in maintenance challenges within the logistics sector of the Indian industry. In the course of this work, the maintenance problem is addressed through the execution of root cause analysis (RCA) on the factors contributing to the increase in downtime. A crucial aspect of this research involves the integration of Total Productive Maintenance (TPM) principles into project-oriented businesses. The study highlights the manner in which well-planned TPM initiatives enhance organizational performance and underscores the importance of effective TPM program management in initiating long-term maintenance improvement projects. The application of root cause analysis and TPM techniques can reduce maintenance issues by 50%.

Keywords: Root Cause Analysis (RCA), Total Productive Maintenance (TPM), and organizational performance.

INTRODUCTION

The effectiveness of production is assessed by productivity. It shows the proportion of inputs—the resources needed to produce it—to production, or actual output. The entire output divided by the total input is the measure of productivity. A particular organization's control managers focus on increasing productivity through process-oriented observations and enhancements.

Productivity – Meaning

The connection between the resources consumed in production (input) and the resulting quantity produced (output) is referred to as productivity. It represents the ratio of resources employed in the production process to the output of goods and services.

The principle underlying the total productivity maintenance system (TPM) is that every employee within a facility should participate in maintenance activities, rather than limiting this responsibility to the

maintenance team alone. This approach seeks to incorporate maintenance into the daily operations of a facility by leveraging the skills of all personnel.

OBJECTIVES OF THE STUDY

This study's primary goal is to examine and evaluate the logistics industry's approach to implementing the Total Productivity Maintenance System (TPM). The particular goals are to:

- Examine how logistics companies apply the Total Productive Maintenance (TPM) components of Planned Maintenance (PM) and Autonomous Maintenance (AM).
- Increase the machinery's dependability and maintainability.
- Strive to improve operators' equipment proficiency.
- Why Establish a motivated workplace and assess how the Re-Engineered TPM strategy, which combines Autonomous Maintenance, Planned Maintenance, and Asset Productivity, affects manufacturing performance.

NEED OF THE STUDY

- The goal of this study is to examine the application of TPM in order to determine how its advantages are being realized, how it might be improved, and how the brewing company's successes could be duplicated in other businesses in the same sector to cut down on losses and boost output.
- The business must preserve its priceless assets. To achieve a high degree of maintenance performance, the maintenance body should figure out how to implement global best practices. First and foremost, it is critical to understand what these best practices are.

SCOPE OF THE STUDY

- The study's scope examines productivity and maintenance in comparison to the plan and updates upper management on the findings.
- To support, advise, and exert pressure on operating management to set goals and make plans.
- To gather and compile information in terms of the entire organization and make sure that it aligns with long-term goals and other components of the overall business strategy;
- To offer the research required for efficient organizational and workforce planning

REVIEW OF LITERATURE

J.G. Prendergast (2023) Equipment will unavoidably malfunction and break down, regardless of how advanced or simple it is in operation and design. Procedures for equipment maintenance are essential in any business where manufacturing is the principal activity. Not only does equipment maintenance need to be planned for, the possibility and probability of failures and disruption to operations must also be addressed when planning and scheduling production. The foundation of the many maintenance management techniques currently employed in global manufacturing is examined in this research. These tactics support the maintenance function and make it possible to optimize the maintenance process.

Gabriela Rusu (2023) Achieving excellent performance in companies is mostly dependent on motivation. Since employee motivation and organizational climate are closely related, managers' ability to foster a supportive organizational climate is crucial to creating a motivating work environment in industrial firms. This paper's primary goal is to highlight the organizational climate's most pertinent aspects that, in accordance with Herzberg's dual factors theory, boost employees' intrinsic and extrinsic motivation.

RESEARCH METHODOLOGY

Research methodology is a methodical approach to problem solving; it comprises the different processes that a researcher typically takes when investigating the topic and the reasoning behind them. The current investigation Logistics industries' systems for maintaining total productivity

RESEARCH DESIGN

A research design is the configuration of parameters for data collection and analysis with the purpose of achieving a balance between procedural efficiency and relevance to the study's objectives. For these studies, a descriptive research design was adopted.

METHOD OF COLLECTION

Primary data: Primary data is information that has just been gathered. Primary data has mostly been gathered by surveys, in-person interviews, and other methods.

Secondary data:

Data that is already available is termed secondary data. The method of collecting and examining secondary data is referred to as desk research. Typically, secondary data is collected by specific organizations or agencies that have already processed it when utilized by the researcher.

SAMPLING METHODS

The population is the total number of elementary units in the survey. Here, the whole logistics sector is covered.

SAMPLE SIZE

The productivity maintenances were the sole basis for the study. A total of 130 respondents were included in the study's sample.

SAMPLING UNIT:

Sampling unit is in Salem.

Sample design

Convenience sampling techniques were used for the study.

LIMITATIONS OF THE STUDY

- The study's duration is restricted to the researcher's available time, and it simply looks at the logistics materials' desire to provide a suitable response to the query.
- The respondents lack the courage to discuss their personal and professional issues.
- The researcher encountered challenges when collecting data from various industries.
- Because some of them were disregarded and lacked the necessary expertise to adequately explain their business.

CHI-SQUARE ANALYSIS

NULL HYPOTHESIS

HO: There is no connection between the focus on creating TPM policies and the goal and effort to boost efficacy.

ALTERNATIVE HYPOTHESIS

H1: There is a connection between the focus on creating TPM policies and the goal and effort to boost effectiveness.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.150E2[a]	9	.000
Likelihood Ratio	271.590	9	.000
Linear-by-Linear Association	121.492	1	.000
N of Valid Cases	130		

RESULT

Because the quantity in the table is less than the amount that was calculated. Thus, the null hypothesis is refuted. The action done to increase efficacy has nothing to do with the purpose of creating TPM policies.

CORRELATION

The table illustrates how the stages of loss relate to the gradual increase in equipment cycle times, whereas the TPM pillar centers on routine maintenance.

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Correlations

			Stages of loss refers to the gradual in equipment cycle times	Pillar of tpm focuses on routine maintenance
Kendall's tau_b	Stages of loss refers to the gradual in equipment cycle times	Correlation Coefficient	1.000	.734**
		Sig. (2-tailed)	.	.000
		N	130	130
	Pillar of tpm focuses on routine maintenance	Correlation Coefficient	.734**	1.000
		Sig. (2-tailed)	.000	.
		N	130	130
Spearman's rho	Stages of loss refers to the gradual in equipment cycle times	Correlation Coefficient	1.000	.766**
		Sig. (2-tailed)	.	.000
		N	130	130
	Pillar of tpm focuses on routine maintenance	Correlation Coefficient	.766**	1.000
		Sig. (2-tailed)	.000	.
		N	130	130

RESULT

This relationship is favorable. The stages of loss, which describe the progressive lengthening of equipment cycle durations, are related to the TPM pillar of routine maintenance.

ANOVA

NULL HYPOTHESIS

Ho: There is no discernible relationship between the respondents' years of schooling and TPM's ability to boost productivity.

ALTERNATIVE HYPOTHESIS

H_1: There is a noteworthy relationship between the respondents' years of schooling and TPM's contribution to higher production.

ANOVA

EDUCATIONAL QUALIFICATION OF THE RESPONDENTS			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		135.123	4	33.781	106.508	.000
	Linear Term	Unweighted	103.365	1	103.365	325.902	.000
		Weighted	126.559	1	126.559	399.030	.000
		Deviation	8.565	3	2.855	9.001	.000
Within Groups			39.646	125	.317		
Total			174.769	129			

RESULT

H1 is accepted based on the aforementioned analysis, which shows that the computed F-value is a positive 106.508 value. There is a substantial correlation between the respondents' years of schooling and TPM's contribution to productivity growth, as indicated by the P value of 0.000 being less than < 0.05. The results are substantial at 4% level.

SUGGESTIONS

- The TPM team has been thought to be incapable of coming up with ideas for cost-cutting measures.
- By using all relevant data and the production line's status, the Total Productive Maintenance (TPM) strategy, which focuses on overall equipment effectiveness (OEE), aims to show that operators and maintenance personnel can collaborate effectively to produce more improvement proposals and to guarantee the availability, performance efficiency, and proper functioning of equipment. The findings showed a relationship between the TPM method and expected maintenance expenses. Other elements that affect manufacturing success can be examined in greater detail in future studies.
- For instance, the model mix, automation degree, vertical integration, product qualities, and market demands can all affect production performance.

CONCLUSION

TPM works to guarantee that losses related to equipment are kept to a minimum and that further efforts are taken to minimize losses or faults connected to equipment. As several experts have pointed out, TPM could fundamentally aid in reducing equipment depreciation, hence enhancing performance. It's possible that this association wasn't robust enough to withstand the multivariate analysis. Their case study suggests that work habits and communication, especially for production lines and different shifts, may have an effect on the morale of TPM team development. It is possible to infer from this study that the operator level and other departments do not have a clear perception of the TPM team's leadership and communication.

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