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A STUDY ON EVALUATING TOTAL PRODUCTIVE MAINTENANCE PRACTICE IN AJUTE INTERNATIONAL PVT LTD.

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ABSTRACT

This project titled "A Study On Evaluating Total Productive Maintenance practice in AJute International PVT LTD. The main objective of TPM is to increase the Overall Equipment Effectiveness of plant equipment. TPM addresses the causes for accelerated deterioration while creating the correct environment between operators and equipment to create ownership. Convenience sampling method has used in the research work. Multiple choice questions have been chosen to collect the responses from 120 employees from Ajute International Pvt Ltd. Data has been analyzed through various statistical tools like Karl Pearson's Correlation, Chi- square test and One-way Anova test.

INTRODUCTION

In Industry, **Total productive maintenance** (**TPM**) is a system of maintaining and improving the integrity of production and quality systems through the machines, equipment, processes,and employees that add businessvalue to an organization.TPM focuses on keeping all equipment in top working condition to avoid breakdowns and delays in manufacturing processes. TPM brings maintenance into focus as a necessary and vitally important part of the business. It is no longer regarded as a non-profit activity. Down time for maintenance is scheduled as a part of the manufacturing day and, in some cases, as an integral part of the manufacturing process. The goal is to hold emergency and unscheduled maintenance to a minimum.

COMPANY PROFILE

AJute International Pvt Ltd has an experience of 30 years in manufacturing and marketing a diverse range of jute products, comprising traditional jute items as well as diversified modern jute products. The mission of Ajute International Pvt Ltd is to be the leading jute products manufacturer in terms of quality, efficiencies and margins by managing our partners, customers and associates in a productive and efficient manner. The mission of AJute International Pvt Ltd is to be the leading jute products manufacturer in terms of quality, efficiencies and margins by managing our partners, customers and associates in a productive and efficient manner.

STATEMENT OF THE PROBLEM

The industry's major problem was that of foreign competition. The most powerful competitor was Pakistan which had the advantage, being a late comer, of installing more productive modern machines as against India's old factories crying for modernization. The industry in Pakistan, assured of ample supply of lower-priced and better quality raw-fibre, enjoying a substantial export subsidy and operating through Bonus vouchers, was able to increase her share in the world jute exports from 7% in the fifties to nearly 30% towards the end of the Third Plan Period.

REVIEW OF LITERATURE

- **Lakho et al. (2020)**
  Concluded in their research the implementation of Total Productive Maintenance (TPM) and Overall Equipment Effectiveness (OEE) in Maintenance Management. The authors have discussed few related case studies about the implementation of Total Productive Maintenance (TPM) and Overall Equipment Effectiveness (OEE) in the maintenance management activities of various manufacturing industries. Lakho et. al. (2020) presented the detailed review of Total Productive Maintenance (TPM) and Overall Equipment Effectiveness (OEE) and discussed the implementations and benefits of Total Productive Maintenance (TPM) and Overall Equipment Effectiveness (OEE) in maintenance management activites of various industries.
- **Khan et. al. (2020a)**
  Conducted the exploratory study to explore the major lean manufacturing practices in the textile industry and highlighted the applications of popular lean practices for the textile industry. The authors mentioned the substantial benefits of the applications of highlighted lean practices including Total Productive Maintenance (TPM) in the specific segments of the textile industry**.**
- **Dr. Sridhar K., Chhatrapati Shivaji Institute of Technology, Durg, (2016)**
  The need to develop an integrated maintenance model in organizations can contribute the manufacturing performance improvement. In this case study the Availability of the machine is less or more idle time of the machine affects the schedule time of machine and hence to improve the productivity efforts must also be given to reduce the idle time of machine**.**
- **Ashish M Gohil, Dhaval B, Sanjay Desai (2015)-**
  Quality and Maintenance of manufacturing systems are closely related functions of any organization. Over a period of time two concepts have emerged which are Total Productive Maintenance (TPM) and Total Quality Management (TQM) along with other concepts to achieve World Class Manufacturing system.
- **Jagtar Singh,Richa Sharma (2014**)-
  This paper will review all the Total Productive Maintenance (TPM) Pillars, It can be seen that OEE has shown a progressive growth as shown in Table 5, which is an indication of increase in equipment availability, decrease in rework, rejection and increase in rate of performance. Today, with competition in industry at an all time high, TPM may be the only thing that stands between success and total failure for some companies TPM can be adapted to work not only in industrial plants, but also in construction, building maintenance, transportation, and in variety of other situations.

OBJECTIVES OF THE STUDY

- To study the current status of TPM implementation in AJute International Pvt Ltd
- To know the effectiveness of maintenance and repair works carried out during the facility downtime condition.
- To determine the efficiency of the TPM training programme for new employees
- To identify the biggest hurdles for the effective implementation of TPM in Ajute International Pvt Ltd
- To assess the impacts of TPM in AJute International Pvt Ltd
- To make suggestions to improve the effectiveness of total productive maintenance practice in Ajute International Pvt Ltd.

SCOPE OF THE STUDY

- ·It increases OEE (Overall Equipment Effectiveness) using improvement activities.
- ·It establishes an autonomous maintenance program performed by equipment operators.
- ·It establishes a planned maintenance system.
- ·It requires training to improve operation and maintenance skills.
- ·Increasing Overall Equipment Effectiveness.

NEED FOR THE STUDY

One of the main objectives of TPM is to increase the productivity of plant and equipment with a modest investment in maintenance (TQM) and total productive maintenance (TPM) are considered as the key operational activities of the quality management system. In order for TPM to be effective, the full support of the total workforce is required. This should result in accomplishing the goal of TPM: "Enhance the volume of the production, employee morale and job satisfaction." The main objective of TPM is to increase the Overall equipment effectiveness of plant equipment.

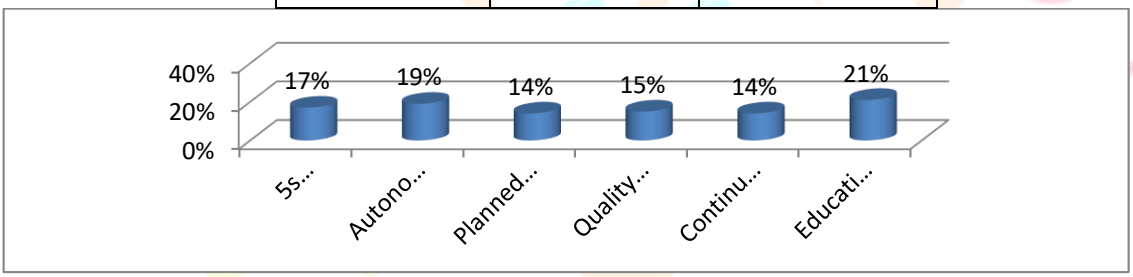
RESEARCH METHODOLOGY

Research Methodology is the specific procedures or techniques used to Identify, Select, Process, and Analyze information. Fundamental to the success of any formal marketing research project is a sound research design. A good research design has the characteristics of problem definition, specific methods of data collection and analysis, time required for research project and estimate of expenses to be incurred.

DATA ANALYSIS

1. THE TABLE SHOWING SEGMENTS BEING PRACTICED AT INDUSTRY

Particulars	No Of Surveyed employees	No Of Percentage
5s technique	20	17%
Autonomous maintenance	23	19%
Planned maintenance	17	14%
Quality maintenance	18	15%
Continuous improvement	17	14%
Education and training	25	21%
Total	**120**	**100%**



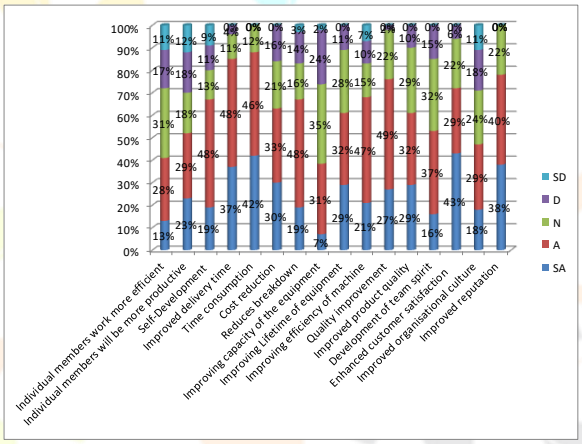
INFERENCE

From the above the table 21% of the surveyed employees are in Education and training segment at industry.

2. THE TABLE SHOWING IMPACTS OF TPM IN INDUSTRIES

Particulars	SA	%	A	%	N	%	DA	%	SD	%	No Of Surveyed employees
Individual members work more efficient	16	13%	34	28%	37	31%	20	17%	13	11%	**120**
Individual members will be more productive	27	23%	35	29%	22	18%	22	18%	14	12%	**120**
Self-Development	23	19%	57	48%	16	13%	13	11%	11	9%	**120**
Improved delivery time	44	37%	58	48%	13	11%	5	4%	0	0%	**120**
Time consumption	51	42%	55	46%	14	12%	0	0%	0	0%	**120**
Cost reduction	36	30%	40	33%	25	21%	19	16%	0	0%	**120**
Reduces breakdown	23	19%	58	48%	19	16%	17	14%	3	3%	**120**
Improving capacity of the equipment	8	7%	37	31%	42	35%	30	24%	3	2%	**120**
Improving Lifetime of equipment	35	29%	38	32%	34	28%	13	11%	0	0%	**120**

Improving efficiency of machine	25	21%	56	47%	18	15%	12	10%	9	7%	**120**
Quality improvement	32	27%	59	49%	26	22%	3	2%	0	0%	**120**
Improved product quality	35	29%	38	32%	35	29%	12	10%	0	0%	**120**
Development of team spirit	19	16%	44	37%	39	32%	18	15%	0	0%	**120**
Enhanced customer satisfaction	52	43%	35	29%	26	22%	7	6%	0	0%	**120**
Improved organisational culture	22	18%	35	29%	28	24%	22	18%	13	11%	**120**
Improved reputation	46	38%	48	40%	26	22%	0	0%	0	0%	**120**



INFERENCE

Therefore 43% of the surveyed employees are strongly agreed that Enhanced customer satisfaction

ONE-WAY ANOVA CLASSIFICATION

Null hypothesis (Ho): There is a significance difference between the Current Status of TPM Implementation in Ajute International Pvt Ltd and Enhanced customer satisfaction.

Alternate hypothesis (H1): There is no significance difference between the Current Status of TPM Implementation in Ajute International Pvt Ltd and Enhanced customer satisfaction.

Current Status of TPM Implementation in Ajute International Pvt Ltd

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
SA	43	2.67	.969	.148	2.38	2.97	1	4
A	29	2.41	1.476	.274	1.85	2.98	1	4
N	22	3.05	.844	.180	2.67	3.42	2	4
D	6	3.00	.000	.000	3.00	3.00	3	3
Total	120	2.70	1.106	.111	2.48	2.92	1	4

Test of Homogeneity of Variances

Current Status of TPM Implementation in Ajute International Pvt Ltd

Levene Statistic	df1	df2	Sig.
30.515	3	96	.000

ANOVA

Current Status of TPM Implementation in Ajute International Pvt Ltd

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.569	3	1.856	1.544	.208
Within Groups	115.431	96	1.202		
Total	121.000	99			

Calculated value = 1.544

Tabulated value = 2.70 F = F cal >F tab F=1.544> 2.70

Hence, the Alternate hypothesis [H1] is accepted.

INFERENCE:

The calculated value of F is greater than the tabulated value. Hence, we reject the null hypothesis and conclude that there is no significance difference between the Current Status of TPM Implementation in Ajute International Pvt Ltd and Enhanced customer satisfaction.

ANALYSIS USING KARL PEARSON'S CORRELATION Correlation analysis is the statistical tool used to measure the degree to which two variables are linearly related to each other. Correlation measures the degree of association between two variables.

Null hypothesis (H0): There is positive relationship between the segments being practiced at industry and Current Status of TPM Implementation in Ajute International Pvt Ltd.

Alternate hypothesis (H1): There is negative relationship between the segments being practiced at industry and Current Status of TPM Implementation in Ajute International Pvt Ltd.

Correlations

		Current Status of TPM Implementation in Ajute International Pvt Ltd	segments being practiced at industry
Current Status of TPM Implementation in Ajute International Pvt Ltd	Pearson Correlation	1	.055
	Sig. (2-tailed)		.583
	N	120	120
segments being practiced at industry	Pearson Correlation	.055	1
	Sig. (2-tailed)	.583	
	N	120	120

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2}\sqrt{N\sum Y^2 - (\sum Y)^2}}$$

INFERENCE:

Since r is positive, there is positive relationship between the segments being practiced at industry and Current Status of TPM Implementation in Ajute International Pvt Ltd

SUGGESTIONS AND RECOMMENDATIONS

- Ajute International Pvt Ltd can take proper measures to reduce document failures that happens on a regular
- Advanced technologies can be used to maximize the benefit of total productive maintenance. Automated system to monitor the process and procedure has to be used across in Ajute International Pvt Ltd
- Few respondents are not clear the various impact of TPM to them and to their company. This need to be eradicated to improve the overall effectiveness and the impact of TPM.
- Some are dissatisfied with the total productive maintenance training because the it is given only once in a year. Management of Ajute International Pvt Ltd can conduct periodical training on TPM
- There is an inadequate in the effectiveness of training materials on TPM. So Ajute International Pvt Ltd can provide adequate training materials to employees to remind about the process and procedures

CONCLUSION

This study has been undertaken to understand the overall effectiveness of the total productive maintenance in Ajute International Pvt Ltd . For this purpose, responses from the employees of Ajute International Pvt Ltd have been collected and analyzed. Advanced technologies can be used to maximize the benefit of total productive maintenance. Automated system to monitor the process and procedure has to be used in Ajute International Pvt Ltd . Based upon the findings out of the research, few valuable suggestions have been given to the management of Ajute International Pvt Ltd to improve the overall effectiveness of the total productive maintenance

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