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To Identify the Factors Affecting Downtime of Ready Mix Concrete Plant- A Review

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Abstract

Downtime is the single biggest cause of lost manufacturing time for most producers. Downtime means the time when there is no machine available for manufacturing. In Ready Mix Concrete we produce a Concrete for Construction Projects. Unexpected failures in equipment can result in expensive process flow interruptions, harm to equipment and loss of product. To determine the factors causes for downtime or slow production of concrete plant along with mathematical model to find its downtime cost through case study. In this paper we are planning to conduct a survey to collect the data from various concrete plants so we design a simple questioner to conduct this survey.

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Key Words:- Downtime, Ready Mix Concrete Plant, Literature Study, Survey, Questioner Design

1. INTRODUCTION

Unexpected failures in equipment can result in expensive process flow interruptions, harm to equipment and loss of product. The time spent in downtime logging equipment can also be readily justified by the time-and money-saving advantages for the maintenance department and the organization as a whole. Literature survey is much helpful to decide which data have to collect and to decide the factors causes for downtime & model for downtime cost.

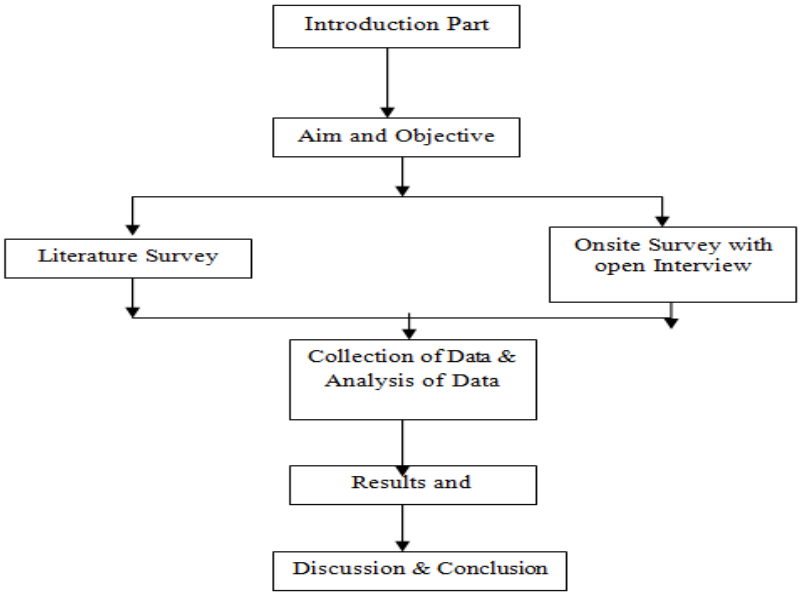
2. AIM & OBJECTIVE OF PAPER

To determine the factors causes for downtime or slow production of concrete plant Following are the objectives of this project,

[1] To identify the various factors causes for downtime of construction equipment through literature review by using journals, papers, books, etc**..**

[2] To design the questioner & collect the data from various concrete plant.

3. METHODOLOGY



Flowchart No. 01 Flowchart of Project Work

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4. LITERATURE REVIEW

The author Damjan Maletic and Matjaz Maletic focus on, the role of maintenance in improving company's competitiveness and profitability. The author developed Conceptual model of maintenance impact on company's profitability, This models shows that maintenance impact on production process by mess defect losses, minimal number of failure, reduce environmental impact etc.

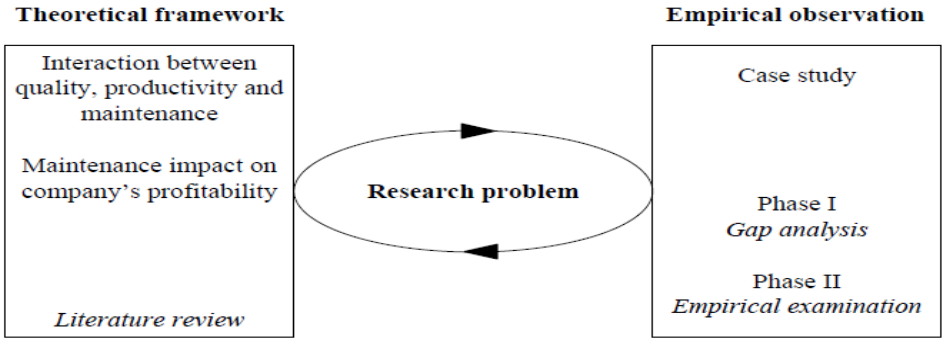

Figure 1. Research design(1)

A per M. Manikandan , M. Adhiyaman, K. C. Pazhani , elevate on benefits of implementing total Productivity as Construction Equipment is the key factor in successfully running the project. There are two primary and secondary sources of information sources in this study. Primary sources of data include interview and questionnaire, these questionnaires and interviews consisted of open ended and closed ended items, while secondary sources were generated by checking relevant documents. The contribution of each of the factors to overall delays was examined and the ranking of the features was conducted in terms of their criticality as perceived by the respondents using the Relative Importance Index (RII), which was calculated using equation and the evaluation results are shown.

$$RII = \sum W / A*N \ (0 \leq RII \leq 1)$$

As per D. B. Phadatare & S. B. Charhate, research aims to find out how construction equipment impacts the efficiency of building activities and to analyze the flow of traffic. In maintenance, it is essential to maintain as many parts as possible in their initial form to guarantee safety and velocity of manufacturing. It involves inspection, adjustment and maintenance, major workshop repairs and overhauls, tiny field repairs and adequate machine layout. The overall equipment efficiency was improved with less idling, low machine breakdown and minimized crop accident that maximized productivity rate, optimized process parameter.

As per Juraj Drahnovsky, Equipment maintenance is one of the most important components of production services management Determination of the category by the dominant influence, for example. Safety, environment, manufacturing, etc. Category determination by cost category Safety / Environment: cost of safety, cost of eliminating the implications of breakdowns, category Production: cost of repair, cost of production lost, cost of logistics, and other category: cost of repair, cost of logistics.

The author, **Poonam P. Patil, Rohit R. Salgude**, focus on using a mathematical model in her paper to find out downtime cost of RMC, as per authors, Failure reasons for RMC Plant following are the failure reasons of RMC Plant- Health of the plant, Irregular maintenance of plant,No use of checklist on regular basis, Unawareness about plant, Gradually wear of machine, Failure due to force majeure, Lack of experts on plants, Improper maintenance of plant, Unavailability of records of machines maintenance. For analysis of RMC plant the author use COX Model. This model gives the annual loss due to equipment failure.

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5. RESEARCH GAP

Through these literature reviews, we understand downtime of equipment affect on our profitability & quality; following are the research gap we found from this research study,

- ✓ Future studies are required to define the most significant Downtime related variables and procedures.
- ✓ Survey was performed by various author but some more parameters is required on ground level to identify the Downtime of equipments.

6. DATA COLLECTION

Data collection enables a person or organization to answer relevant questions, evaluate outcomes, and predict future probabilities and trends. 25 questionnaires are to be distributed to technical persons, owner of Concrete mix plant in Pune- Pimpri Chinchawad area. To identify the practical factors which affect the productive of machines and also to find the various reasons of equipment breakdown, and also to find the remedial measure for same the questionnaire survey is conducted in which the following questions are included-

1] Nature of Participant-_____
2] Name of Company- _____
3] Name & Address of Company - _____
_4] Name of Participant with Designation & Contact No. & e-Mail —_____

A] General Information-

Qn. No.	Questions To Be Ask	Dry mix Concrete Plant	Wet mix Concrete Plant	Mobile Concrete Plant	Stationary Concrete Plant
A1	Which Kind of plant do you have in your company?				
A2	What is the Price of Plant?				
A3	What is the Capacity of that Plant?				
A4	What is the average production hour per day of Plant?				

B] Questions Based on Actual Plant Failure Related-

Marks for Question is as per follows,

1) **1 – Strongly Disagree** 2) **2 - Disagree**
3) **3 – Neither Agree Nor Disagree**
4) **4 - Agree** 5) **5 – Strongly Agree**

Qn. No.	Questions To Be Ask	Response					Remark
		5	4	3	2	1	
B1	Does irregular maintenance affect the productivity of Plant?						
B2	Does keeping checklist during inspection of plant reduce the frequency of breakdown?						
B3	Does plant fail due to operator fault?						
Qn. No.	**Questions To Be Ask**	**Response**					**Remark**
		5	**4**	**3**	**2**	**1**	
B4	Does plant fail due to helper fault?						

B5	Does the plant fail due to use of it's over limit?						
B6	Does machine fail due to irregular maintenance?						
B7	Does lead distance affect the productivity of machine?						
B8	Is workability of equipment dependent upon the skills of operator, helper?						
B9	Does the age of plant factor affect the productivity?						
B10	Due to Lack of experts on plants, Plants may Failure?						
B11	Unawareness of new technology is reason for failure of plant?						
B12	Unavailability of records of machines maintenance is reason for failure of plant?						
B13	Due to improper segregation of material is reason of failure of plant?						
B14	Lack of commutation between the staff is reason of failure of plant?						
B15	Gradually wear of machine is reason of failure of plant?						
B16	Does wedges for worker is the reason for failure of Plant?						
B17	Does the competition is the reason for failure of Plant?						
B18	Does the Political influence is the reason of failure of plant?						
B19	Does the quality of RMC problem is the reason of failure of plant?						
B20	Does the non availability of Resources is the reason for failure of plant?						
B21	Does the location of plant is the reason of failure of plant?						
B22	Does non availability of second supporting system of operation plant is the reason of failure of plant?						
B23	Does the training to operator, labor may reduce the failure of plant?						
Qn. No.	**Questions To Be Ask**	**Response**					**Remark**
		5	**4**	**3**	**2**	**1**	

B24	Does the proper inventory for material may reduce the failure of plant?						

Sign & Stamp of Respondent

Before giving the questionnaire to the expert personal, following information was described.

- ✓ The personal just have to give rating by making tick into the box.
- ✓ Each question carries only one answer
- ✓ Use five point scale Etc.
- ✓ Respondent must give his/her opinion or suggestion for minimization of downtime.

6. DISCUSSION & CONCLUSION

From the literature reviews it's clear that the Downtime is the single biggest cause of lost manufacturing time for most producers. Various Literature reviews focus on, maintenance is very important for profitability of any company, no doubt survey is the good practice to identify the different factors but at the same time in local area the level of problem is different most of the researcher not focus on different factors like, training to helper & operator is important, over production than recommendations, lead distance, record keeping for maintenance, political & location aspects etc. This questioner survey helps us to find out the factors causes for downtime.

7. FURURE SCOPE

In next time we collect the data from various plant operator/Plant Owner to identify the factors with the help of RII method and find out the rank of these factors.

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