

It Application in-"Mill Wide Maintenance Strategies" in Paper Industry

Rajesh Chopra, Piyush Gupta,
Harish Bhatt-Bhatt, J.K. Gupta

ABSTRACT

With the advent and advancements in IT, Manufacturing organization has been opting to go for IT solution in large numbers to have the control and maximizing the efficiency of their operations. Though not much have been seen in Pulp & Paper industry to go for ERP solutions but the recent years growth has now showing effect on this industry as well and one can see increased awareness and willingness to opt these kind of systems. The application of CMMS can extensively help any organization in cost effective, efficient and reliable maintenance.

INTRODUCTION

Pulp and paper industry falls under the category of **Process industries** which stake their profitability on rapid response to cyclic changes in the market and on effective use of equipment energy, wood supply and Waste Paper and water resources. Key to these factors will always be strong production facilities running 24x7 with reliability and assurance of minimum breakdown and unexpected failures or else you see them resulting in direct loss of revenues and reputation and an uncontrollable increase in expenses. A good Computerized Maintenance Management System (CMMS) cannot direct global markets, but it can guide a company to improved work and business practices that increase competitiveness in the market.

A CMMS can also help organizations use their resources more productively. Maintenance departments can substantially increase labor productivity, decrease inventory needs and reduce equipment downtime by eliminating waste and spotting repair trends. More than anything, CMMS is a way of keeping accurate and timely accounts of maintenance activities. Such measurements allow effective management decisions instead of blind guesses and provide the kind of feedback needed to continue making improvements. They also let maintenance personnel become proactive rather than reactive-getting on top of things rather than simply responding to problems as they arise.

However blindly getting an ERP with

good CMMS and expecting your production facilities to run in order will only make you added to the CMMS implementation failure list. It requires complete involvement of management and Production and maintenance personnel to devote them to such software and have the patience and hard work which is required if you want to reap the actual benefits of this kind of systems.

Every manufacturing organization (especially process industries as the case of Paper & Pulp) small or big has some kind of maintenance management in place. It may range from Act as it happen to full planned and automated maintenance management systems.

Intense competition and increased opportunities making companies stress on making sure their plant run for 24x7 with minimum downtime and unexpected and breakdown and this fact has made CMMS an integral part of an ERP systems like finance etc.

Just as Finance module helps to manage the financial activities of an organization, maintenance management software provides the organization with the means to manage maintenance effectively. CMMS module gives the ability to capture information and make powerful decisions about the valuable assets of a organization, whether those assets are production equipment or rooms in a facility.

The article provides in detail answers to many questions like why do we need such software and why it's gaining high importance in ERP Software.

Features of the CMMS

1. Effectively Plan Maintenance Functions

CMMS lets one take control of maintenance functions in their organization, giving the freedom to move maintenance activities out of crisis mode and into planning mode.

2. Improve Productivity

CMMS improves organization's productivity by maximizing equipment uptime and keeping assets in peak operating condition. This reduces unplanned downtime and demand maintenance. Work efficiency is also achieved through better scheduling of maintenance staff.

3. Lower Overall Operating Costs

CMMS lets the organisation to control and lower maintenance department costs. Thus giving significant savings by preventing expensive repairs before they occur and improving the efficiency of routine maintenance tasks. And because mills can't stop paying employees when equipments isn't functioning, preventing downtime also delivers lower operating costs.

4. Keep on Top of Legal Obligations and Liability

CMMS can remind of inspections and preventive maintenance chores that are required by law. For example, facility management personnel may have the legal obligation to perform regular upkeep on various types of equipment (elevators, fire prevention systems, medical equipment, etc.). CMMS can make sure to know when maintenance

Kalptaru Infosoft (P) Ltd.
701, Avdhesh House, Opp. Gurudwara,
Thaltey, S.G. Highway, Ahmedabad-380 054

is required, can keep reminding until the work is actually done, and can preserve records proving that the necessary maintenance was completed. In this way, CMMS can protect the organization against lawsuits and other potential risks.

5. Extend Equipment Life

When an organization maintains equipment with proper inspections and preventive maintenance, it doesn't have to be replaced as often. Extending the life of expensive equipment saves the organization money.

6. Reduce insurance Premiums

Many insurance companies have recognized that proper use of a CMMS reduces the chance of costly insurance claims. The facilities are safer with CMMS because maintenance work gets done promptly and reliably. The equipment suffers fewer malfunctions and preventive maintenance inspections can spot potential dangers before they actually cause trouble. For this reason, insurers may reduce the premiums of organizations using a CMMS.

7. Record and Store Valuable Information

Perhaps the greatest utility of CMMS is its ability to provide with relevant information regarding maintenance functions. For example, CMMS can alert organization to under-performing equipment or spaces, labor inefficiencies and reasons for production outages. This type of information lets the mill make better and more accountable decision about maintenance functions in the organization.

What CMMS does

It keeps records about an organization's maintenance operations. The CMMS notes what jobs have been done, schedules what jobs need to be done in future, and keeps track of all information relevant to maintenance work. A comprehensive solution can record costs of labor and materials on a per-job basis, can show what equipment is under warranty, and can tell when to reorder spare parts.

More than anything else, a CMMS lets the organization to measure what they are doing. It helps them to answer questions like these:

- What was the total cost of maintenance (labor and materials) on a particular piece of equipment in the past year?
- What's the replacement cost of that same piece of equipment? When is it more cost-effective to replace the equipment rather than keep repairing it?
- What was the total amount of downtime on that equipment (from which one can calculate downtime costs to the company)?
- What kind of problems did the equipment have? Do the repairs have an overall pattern that suggests maintenance procedures should change? Is it likely that more frequent inspections or preventive maintenance will stop trouble before it happens. It can prove that this would be worth the cost.

The organization can't make sensible management decisions until they have the facts. A CMMS gathers all the facts in one place, and provides maintenance personnel with overviews, summaries, or detailed reports as needed. Armed with such facts, maintenance personnel usually find it easier to show senior management the value of maintenance work.

What is in a CMMS ?

Basically it provides the following features:

1. Complaint & Request Management

Keeping track of problem reports received from sources outside the maintenance department (e.g. complaints from other departments in the organization).

2. Work order management

Keeping track of work orders prepared by maintenance personnel. This includes the creation of work orders, plus recording the results of each job

after it's finished. The creation of work orders include.

- Description of the job
- Specifying date and time the job should be done
- Estimating length of job
- Assigning personnel and estimating labor costs
- Reserving materials expected to be needed for the work.
- Specifying accounting information for the job (e.g. account to which costs should be charged)
- Recording useful information for workers (e.g. access information, contact people, applicable service contracts).

After job is finished, it records information like the following;

- What the job actually entailed
- Actual start and end times for the job
- Actual labor costs and material usage
- Length of down-time for any equipment involved
- Actual cause of the problem
- Any other detail that might be relevant now or in future

Work order management also includes automatic generation of work orders for Preventive Maintenance.

3. Equipment management

It keeps the track of the organization's machinery (e.g. assembly lines, manufacturing equipment, vehicles, etc.). This includes keeping records of equipment specifications, meter readings, warranties, service contracts, past repairs, necessary preventive maintenance and spare parts needed to maintain the equipment, cost and replacement cost projections, mean-time between failures, etc.

In essence, a good CMMS can tell maintenance personnel anything they want to know about a piece of equipment before they go off to perform maintenance on that equipment. It can also provide data that may lead to the detection of significant trends; for example, if a number of machines in the same building suffer electrical problems, maybe there's some overall problem with the

building's electrical system.

Equipment records can also simplify making cost-benefit analyses of maintenance activities. For example, one company discovered that the amount they were spending on preventive maintenance for a set of fans was vastly greater than the cost of just replacing the fans whenever they broke.

4. Facility management

It keeps the track of maintenance on an organization's premises. Facilities management requires the same kind of information tracking as equipment management.

5. Inventory control

Keeping track of the materials and spare parts used to perform maintenance activities. This includes ordering stock when current supplies get low, reserving items for use in upcoming jobs and maintaining records of storage locations so personnel can find the supplies they need. Good inventory records let you meet expected requirements without buying more than you need. They also let you minimize the amount of storage space you need by eliminating unnecessary surpluses.

6. Purchasing and receiving

Keeping track of the costs of everything involved with maintenance: materials, service contracts, work done by outside contractors and so on. Related facilities let you determine the cost of the materials you keep on hand, track price quotes from different vendors, monitor inventory "shrinkage", etc.

7. Personnel management

It keeps the track of staff costs and productivity. A CMMS can produce sensible schedules for personnel and can also provide personnel with time-saving information. For example, the CMMS can record any special instructions associated with equipment of facilities, like "Get the key from Chris Smith" or "Repairs must be done before 8:00 a.m. or after 5:00 p.m."

CMMS : Implementation Challenges :

The capabilities and scope of CMMS,

no doubt has significant role to play in an organization but expecting that by introducing it alone would provide the promised benefits would be the most dangerous assumption to hold.

To achieve the maximum possible benefits from a CMMS implementation, business processes must be formally re-engineered and work practices changed in a coordinated and planned manner if significant change is to be achieved. It requires a Business Re-engineering (BPR) approach to Systems Implementation, which focuses on both the Technology and the Business Processes involved in a CMMS implementation.

The people aspect of CMMS implementations is rarely given the attention it deserves. Perhaps this is because the "softer" aspects of Maintenance performance have not been exposed. In any case, skills and culture play a vital role in successful CMMS implementation.

Often, in a CMMS implementation, focus is given to the computing skills required to ensure that those using the new system know how to operate it. It is at least as important, however that they understand **WHY** they are using it. It is only when those people who are using the system understand the importance of the data that they are putting in and how it will be used in the future, that you have at least a fighting chance of getting reasonable data into the CMMS in the first instance. Even better is when those people who are putting data in are also the ones using the data for decision-making. This is an important consideration in designing the control processes mentioned above.

In addition, Maintenance planners need many enhanced skills in job planning (as distinct from job scheduling) and Maintenance Supervisors need enhanced skills in Leadership and Management and that all Maintenance personnel need enhanced skills in Failure Investigation and Analysis and Reliability Centered Maintenance, if the full potential benefits of CMMS are to be realized.

CMMS : Roadmap

The implementation of CMMS should

be considered and implemented as Business Process Reengineering. It requires a certain degrees of patience as it may require to capture data for a good period of time before it starts giving deeper insight to establish optimum maintenance plan.

CMMS allows to arrange Production facilities and system in the same way as they are in real world. It requires concise identification of process and their hierarchies and their interdependence. This is very important as whole implementation plan will be based on it. ***It is essential for all new or unfamiliar items of equipment whose performance is critical to the enterprise to carry out assembly analysis to identify the maintenance-demanding parts. When the maintenance-demanding parts are left to identify themselves by in-service failure it will take years to fully define the PM plan and will cost the business very dearly in business disruption-loss of prime quality throughput, high maintenance costs and SHE violations.***

CMMS implementation requires following series of action for a better turnout from the systems. It's only a brief as it's a detailed activity and its full scope will not be possible to cover under this article.

Analyze the failures associated with the system parts-historical and potential failures and consequences. Once we are done with defining hierarchies we have to identify failure-prone parts from logical engineering analysis. By studying the parts assemblies and their context of operation, the parts prone to failure and their likely failure modes are to be deduced by engineering judgement.

The available records of equipment failure and repair have to be reviewed and should be used to confirm and update the failure profile of parts-and identify worthwhile PM tasks.

Maintenance supervisors who are most knowledgeable about the equipment should be interviewed. Their personal experience and opinion should be used to confirm and update the failure profile to parts and identify worthwhile PM tasks.

An interview session should be conducted with Operators and production supervisors for the same. They know the plant best of all. Even when autonomous maintenance is not officially practiced, most operators carry out small fixes on their equipments. They are most conscious of the plant's 'quality functions' and most familiar with the states of 'partial failure to function' (when a function is degraded but not completely lost). They know the points of equipment unreliability and operational inadequacy.

Once all the information is gained by analysis, inspection and interview, an initial list of maintenance countermeasure tasks for the parts of each system in consideration of the nature of failure, likelihood of failure, impact on the enterprise and the method

of earliest distress detection is prepared. The failure of a system or asset is initiated by the failure of a single component part. The effect of the failure can be localized and minor-or it can have a wider effect, involving collateral damage, with major and even of fatal consequences.

After this exercise Task Groups are formed. Task Group is a bundle of care and maintenance tasks to be carried out together at a defined frequency by a designated 'executor group' on a target system. They can be divided into 'on-line' and 'off-line', depending on whether they must be completed with the target system in an energized or de-energized state. The routine frequencies can standard fixed calendar periods or it can be a user defined range.

Tasks can be marked as next planned shutdown and an expiry date whatever

comes first. So if a planned shutdown occurs before expiry, task can be carried out in that shutdown opportunity and a shutdown can be prevented. Then this process go on regularly and based on the data and reports generated by the system, Maintenance manger has to continuously update the tasks and task groups.

CONCLUSION

The computerized maintenance management system can help mills to achieve two exceedingly important objectives-saving money and improving bottom line. The effect of technology adoption is both immediate and long-term, allowing the mill to quickly improve maintenance operations as well as enjoy enhanced efficiency gains and savings in the long run.