IJEAST

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

VOLUME : 4 ISSUE : 09 Print / Issue Publication Date: 10-Mar-2020

ISSN : 2455-2143

DOI : 10.33564/IJEAST.2020.v04i09.010

Indexed In

Google SCHOLAR OPEN ACCESS doi Crossref

WWW.IJEAST.COM

editor@ijeast.com

International Journal of Engineering Applied Sciences and Technology, 2020
Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 100-103
Published Online January 2020 in IJEAST (http://www.ijeast.com)

IMPLEMENTATION OF COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM IN MAINTENANCE WORKSHOP

Osman Abdelrahman Ali Abdalaal
PHD Student
Faculty of post graduates
Nile Valley University, Atbara, Sudan

M.I.Shukri
Professor
Faculty of post graduates
Nile Valley University, Atbara, Sudan

ABSTRACT- Given the need for a quick response to today's dynamic market, the maintenance function is considered increasingly important for industrial companies. Managing maintenance involves several activities such as: planning of preventive maintenance actions; scheduling of activities considering available resources, management of spare parts; analysis of data to reduce the occurrence of failures and to improve performance of the maintenance function.
Effective resource management and reliable equipment are essential to optimize plant performance. Both depend up on accurate and timely management of massive amount of data and on the effective use of maintenance resources. Computerized maintenance management system (CMMS) also called computerized asset management system (CAMS), is a software that designed to fulfill these needs. This system can support cost effective means of managing and utilizing a massive amount of data that are generated by maintenance, inventory control, operation, purchasing and other relevant activities. This paper presents the challenges of successful CMMS implementation. .

Keywords: preventive maintenance, computerized maintenance management system, Maintenance, performance, measurement.

I. INTRODUCTION

For years, maintenance has been treated as a dirty, boring and ad hoc job. It's seen as critical for maintaining productivity but has yet to be recognized as a key component of revenue generation. The question most often asked is "Why do we need to maintain things regularly?" The answer is "To keep things as reliable as possible." However, the question that should be asked is "How much change or degradation has occurred since the last round of maintenance?" The answer to this question is "I don't know." Today, most machine field services depend on sensor-driven management systems that provide alerts, alarms and indicators. The moment the alarm sounds, it's already too late to prevent the failure. Therefore, most machine maintenance today is either purely reactive (fixing or replacing equipment after it fails) or blindly proactive (assuming a certain level of performance degradation, with no input from the machinery itself, and servicing equipment on a routine schedule whether service is actually needed or not).

Rather than reactive maintenance, "fail-and-fix," world-class companies are moving forwards towards "predict-and-prevent" maintenance. A maintenance scheme, referred to as condition based maintenance (CBM) that was developed by considering current degradation and its evolution. CBM methods and practices have been continuously improved for the last decades; however, CBM is conducted at equipment level − one piece of equipment at a time, and the developed prognostics approaches are application or equipment specific.

II. MANUAL SYSTEM

Computerized systems is now being installed in preference to the manual (paper based) preventive maintenance systems that have been around for many years. Commonly, these paper systems are little more than a record of scheduled maintenance. These have had limited success because of:

- The problems associated with training people to be disciplined enough to maintain the maintenance system, that is, to input the data to the system.
- The effort required, by supervisors and managers, in the organization and documentation of the system.
- Trade group's reluctance to become involved in paper work.
- The effort associated with the acquisition and compilation of meaningful data and statistics from the system.

In the paper system, each piece of equipment or asset has a history card or file. This file contain the asset's detailed description, along with information on maintenance procedures to be used, periodicities, trades required, last maintenance dates, and some out of date information about the breakdown, which occurred years ago! To determine what maintenance is due requires someone to look through every card, check each of the last maintenance dates against the periodicities and select those, which are due.
Next, the appropriate maintenance procedures must be selected from the file before work instructions are raised and

International Journal of Engineering Applied Sciences and Technology, 2020
Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 100-103
Published Online January 2020 in IJEAST (http://www.ijeast.com)

issued to the relevant trade's persons. Upon completion of the work, the relevant asset's file must be selected, details updated and the file replaced in its slot. Whether one or several persons complete these tasks, many man-hours are involved and to properly support any reasonable sized system of this type can become virtually a full time occupation.

III. WHAT SHOULD CMMS DO?

In simplest terms, CMMS should cover the following basic operations:

- Identifying the maintenance tasks to be done, listing each job and the steps to complete it.
- Describing the contents of each job or step.
- Planning jobs
- Scheduling jobs.
- Supporting the actual performance.

Certain support operations may be carried out by CMMS as enhancements to the basic operations. CMMS can:

- Keep a history of what was done in the past.
- Manage parts and materials in the inventory.
- Provide access to of repair procedures, bills of materials, drawings, and sketches.
- Monitor and report on equipment condition.

BASIC SYSTEM FEATURES:

Computerized maintenance management systems features include:

- Work order management.
- Project management.
- Preventive and predictive maintenance.
- Equipment listing.
- Equipment history.
- Parts and stores inventory.
- Management reports generation.
- Work planning, estimating, and scheduling.
- Financial and budget controls.
-

IV. CMMS IMPLEMENTATION

Implementation of the chosen package is critical for CMMS success. No matter how good and user-friendly a system, if the implementation is not carried out in a proper manner, it will be impossible for the system to live up to its expectations. The implementation of CMMS can be broken into three parts: user training, evaluation of the workshop, and entry of data into the system. All three parts are equally important to the success of the CMMS.

User Training.

User training should be focused on the work situation of the people who will be using CMMS and not just a learning exercise on how to push the right key on the computer. The training should be more of a workshop in which the trainer and users work with life examples from the maintenance management system environment. The trainer must teach personnel about how the system is designed and operated, and procedures must be developed about data collection.

Evaluation of the Workshop:

During the evaluation of the workshop, the implementation team prepares a plan for guiding all activities that support the installation of the computerized maintenance management system. A major portion of the plan deal with how to obtain inventories, databases, and pertinent files pertaining to other topics. Some of these topics include capital assets, manufacturing and facilities equipment, miscellaneous equipment, preventive maintenance schedules, predictive maintenance schedules, spare parts and materials, financial and budget information, personnel files, and reports. The information developed through data already on file, or it is necessary to obtain it by physically counting assets and equipment or other items at the site. Usually, a combination of these two approaches is necessary to evaluate the workshop completely and obtain all information needed to ensure the system is set up properly. The team will prepare all information in a format suitable for further action by the data entry function.

Data Entry:

Data entry is the most time consuming but also the simplest part of the implementation. The team of data entry personnel needs to enter the data, or information, into the computerized system databases in the format and quantity the system requires. The data entry persons do not have to have extensive knowledge of the system. However, this stage needs to be supervised by people who thoroughly understand the system.
.

V. SYSTEM OPERATION:

With the advent of powerful personal computer (PC) technology, CMMS is supported by microcomputers. At some point in the growth process, the systems may require larger capability, such as minicomputers or even mainframe computers according to the data to be entered. Even so, there are often PCs in the work areas which serve as terminals for communication with the host computer.

CMMS is usually operated by workshop personnel who enter instructions at the computer keyboard. Typically, these entries are made in response to questions, or prompts appearing on the monitor screen. A whole screen full of prompts is called a menu. The simplest and easiest CMMS use menus. The system is designed to serve several users at once, providing all with simultaneous access to the data files they need. The system operates in an on-line, real-time mode. Managers should be alert for improvements in CMMS capabilities just because constantly changing management responsibilities require timely and appropriate information for making effective decisions.

International Journal of Engineering Applied Sciences and Technology, 2020
Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 100-103
Published Online January 2020 in IJEAST (http://www.ijeast.com)

VI. REPORTS:

A dizzying array of reports is available with CMMS. These vary from fixed, standard reports that are common to most all systems to highly customized reports useful only to users having unique information requirements. Generally, reports are offered in categories such as:

- Work orders: remedial, corrective, project, preventive, predictive, alarm based, routine, administrative.
- Workload reports: current, backlog, project, priority.
- Labor utilization: trades, shift, customer, priority, dates.
- Equipment: uptime, history, trends, class, problems, cost.
- Budget variance: shop, equipment usage, labor, program, energy.
- Inventory: purchases, turnover, stock out, obsolescence, status.
- Custom: schedule analysis, repair history, work completed, quality assurance, overtime, part and equipment cross reference, labor and materials distribution.

VII. BENEFITS OF USING CMMS:

The purpose of operating CMMS is to improve performance of equipment or plant capability, as well as save maintenance time and costs. It may be difficult to specify why excellent maintenance is a necessity for producing a product or service of higher quality at lower cost than the competition. But it is widely accepted that lack of excellent maintenance can inhibit this goal. In fact, popular concepts such as total quality management (TQM) and total productive maintenance (TPM) emphasize that maintenance must be performed optimally to ensure competitiveness.

The advantage of computerizing the management of maintenance is that it allows monitoring of more activities, information, and knowledge, without spending more money in the process. Some specific measurable benefits of using CMMS include:

- More effective use of maintenance workers time.
- Less production loss.
- Improved equipment life and resale value.
- Improved product quality.
- More effective use of parts and materials.
- Lower parts and inventory requirements.
- Improved equipment reliability and dependability.
- Improved cost control
  – Higher equipment reliability
  – Traceable labor costs
  – Reduction of spare parts carrying cost
- Better understanding of equipment.
- Faster workforce training.
- Standardized procedures which can be continually improved.
- Data Consistency.

VIII. HOW CMMS CAN REDUCE COSTS:

Using a CMMS can make scheduling of maintenance more efficient and reduce administrative labor. But the system pays dividends in other ways as well.

The traditional means of keeping these records – on paper, in logbooks – not only required a substantial amount of work, it increased the chance that important vehicle and equipment upkeep would be overlooked. Without a centralized system that managed all assets, manually keeping track of so many individual variables meant a high probability of error.

In contrast, CMMS can monitor maintenance intervals and provide automatic reminders when ordinary maintenance is due, for an entire fleet. This can prevent equipment failure and expensive repairs or replacement.

IX. SUMMARY:

The time and effort needed to select and implement CMMS are well spent because of the benefits and savings they offer in managing the maintenance function. Intense evaluation of the requirements of the user should be undertaken before any system is chosen. There is a support cost associated with using CMMS. Constant attention must be given to keeping the system up to date and supplied with input data. Growth of the maintenance department's responsibilities may require expansion and upgrading, even replacement, of the system. These represent added cost. But the added dimension CMMS offer in managing the maintenance function is well worth the investment.

X. REFERENCES:

1. Bagadia, Kishan(2010-7-19).Computerized Maintenance Management Systems Made Easy: How to Evaluate, Select, and Manage CMMS. McGraw Hill Professional.(p.65-233).
2. Cato, William; Mobley, Keith (2002). Computer-managed Maintenance Systems: A Step-by-step Guide to Effective Management of Maintenance, Labor, and Inventory. Butterworth-Heinemann. (P.45-67-172).
3. Cato, W. W., and Mobley K. R. (2001). Computer Managed Maintenance System. Elsevier Science & Technology Books.(p112-283).
4. Dunn, S. (1997), Implementing a computerized maintenance management system: why most CMMS implementations fail to provide the promised benefits, paper presented at Maintenance in Mining Conference.
5. Isabel Lopes et al /Procedia CIRP (2016, Requirements specification of a computerized maintenance management system, paper presented at Maintenance in Mining Conference.

6. Labib, A. W. (2003), Computerised Maintenance Management Systems (CMMSs): A black hole or a black box?, Journal of Maintenance & Asset Management, (p18, 16–21).
7. Labib, A W. (1998), World-class maintenance using a computerised maintenance management system, Journal of Quality in Maintenance Engineering,
8. Mather, D. (2009). Developing CMMS Implementation Templates. Plant Maintenance Resource Center.(p . 4, 66–75).
9. Mather, D. (2002). CMMS A Timesaving Implementation Process. Boca Raton London New York Washington, D.C. CRC PRESS
10. Michael Wienker etal .Procedia Engineering 138 (2016) The Computerized Maintenance Management System An essential Tool for World Class Maintenance.
11. O'Hanlon, T., Computerized Maintenance Management and Enterprise Asset Management Best Practices, 2005.(p.182 -205).
12. Rastegari A, Mobin M. Maintenance decision making, supported by computerized maintenance management system. 2016 Annu. Reliab. Maintainab. Symp., IEEE; 2016.
13. Swanson, L. (1997), Computerized maintenance management systems: a study of system design and use, Production and Inventory Management Journal, Vol. 38 No. 2
14. Wireman, Terry (1994). Computerized Maintenance Management Systems. Industrial Press Inc.(p 220-264).
15. YEE V. ADVANCING CMMS TO SUPPORT PERFORMANCE BASED ASSET MANAGEMENT. PROC WATER ENVIRON FED 2007;2007:894–902 .
16. Yonas Lemma (Proceedings of eMaintenance 2012, Luleå, 12-14 December), CMMS Benchmarking Development in Mining Industries, paper presented at Maintenance in Mining Conference.

IJEAST

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

ABOUT IJEAST

International Journal of Engineering Applied Science and Technology (IJEAST) is a peer-reviewed, open access journal that publishes high-quality research papers in the field of Engineering, Applied Science and Technology.

IJEAST aims to provide a platform for researchers, academicians, and professionals to share their innovative ideas, research findings, and practical experiences with the global scientific community.

FOCUS AREAS

- Engineering
- Applied Science
- Technology
- Innovation & Development
- Interdisciplinary Studies

PEER REVIEWED
All submissions are rigorously peer reviewed to ensure quality.

OPEN ACCESS
Free and unrestricted access to research for all.

GLOBAL REACH
Connecting researchers and professionals worldwide.

TIMELY PUBLICATION
We ensure a swift and efficient publication process.

For more information, visit our website
www.ijeast.com

INTERNATIONAL JOURNAL
OF ENGINEERING APPLIED SCIENCE
AND TECHNOLOGY

editor@ijeast.com
www.ijeast.com
India

2455-2143