
Chapter 4 Computerized Maintenance Management System

4.1 Introduction

A computerized maintenance management system (CMMS) is a type of management software that performs functions in support of management and tracking of O&M activities.

4.2 CMMS Needs Assessment

In determining the need for a CMMS, facility managers should assess their current mode of operation. Key questions to ask include:

- Do you have an effective way to generate and track work orders? How do you verify the work was done efficiently and correctly? What is the notification function upon completion?
- Are you able to access historical information on the last time a system was serviced, by whom, and for what condition?
- How are your spare-parts inventories managed and controlled? Do you have either excess inventories or are you consistently waiting for parts to arrive?
- Do you have an organized system to store documents (electronically) related to O&M procedures, equipment manuals, and warranty information?
- When service staff are in the field what assurances do you have that they are compliant with all life, health and safety issues (e.g., lock and tag) and are using the right tools/equipment for the task?
- How are your assets, i.e., equipment and systems, tracked for reporting and planning?

If the answers to these questions are not well defined or lacking – you may consider investigating the benefits a well implemented CMMS may offer.

4.3 CMMS Capabilities

CMMS systems automate most of the logistical functions performed by maintenance staff and management. CMMS systems come with many options and have many advantages over manual maintenance tracking systems. Depending on the complexity of the system chosen, typical CMMS functions may include the following:

- Work order generation, prioritization, and tracking by equipment/component.
- Historical tracking of all work orders generated which become sortable by equipment, date, person responding, etc.
- Tracking of scheduled and unscheduled maintenance activities.
- Storing of maintenance procedures as well as all warranty information by component.
- Storing of all technical documentation or procedures by component.

- Real-time reports of ongoing work activity.
- Calendar- or run-time-based preventive maintenance work order generation.
- Capital and labor cost tracking by component as well as shortest, median, and longest times to close a work order by component.
- Complete parts and materials inventory control with automated reorder capability.
- PDA interface to streamline input and work order generation.
- Outside service call/dispatch capabilities.

Many CMMS programs can now interface with existing energy management and control systems (EMCS) as well as property management systems. Coupling these capabilities allows for condition-based monitoring and component energy use profiles.

While CMMS can go a long way toward automating and improving the efficiency of most O&M programs, there are some common pitfalls. These include the following:

- **Improper selection of a CMMS vendor.** This is a site-specific decision. Time should be taken to evaluate initial needs and look for the proper match of system and service provider.
- **Inadequate training of the O&M administrative staff on proper use of the CMMS.** These staff need dedicated training on input, function, and maintenance of the CMMS. Typically, this training takes place at the customer's site after the system has been installed.
- **Lack of commitment to properly implement the CMMS.** A commitment needs to be in place for the start up/implementation of the CMMS. Most vendors provide this as a service and it is usually worth the expense.
- **Lack of commitment to persist in CMMS use and integration.** While CMMS provides significant advantages, they need to be maintained. Most successful CMMS installations have a "champion" of its use who ushers and encourages its continued use.

As reported in A.T. Kearney's and *Industry Week's* survey of 558 companies that are currently using a computerized maintenance management system (DPSI 1994), companies reported an average of:

28.3% increase in maintenance productivity
20.1% reduction in equipment downtime
19.4% savings in lower material costs
17.8% reduction in maintenance, repairs, operation (MRO) inventory
14.5 months average payback time.

Considerations for CMMS Evaluation and Selection

- Have all relevant in-house staff (particularly field staff) been involved with the assessment of need, desired capabilities, and usability of proposed system?
- Does the product meet all of the needs as assessed?
- "Feature overload" is a common complaint of active CMMS users. Are you purchasing more than you need or have the capability to manage?
- Does the product offer module expansion as your system or needs grow?
- If needed, how well does the system integrate with other facility/energy management or accounting systems?
- How long has the vendor been in business? Do they have references for similar installations they could provide?
- How does the vendor provide technical assistance?
- How are product upgrades accomplished, and at what cost?

4.4 CMMS Benefits

One of the greatest benefits of the CMMS is the elimination of paperwork and manual tracking activities, thus enabling the building staff to become more productive. It should be noted that the functionality of a CMMS lies in its ability to collect and store information in an easily retrievable format. A CMMS does not make decisions, rather it provides the O&M manager with the best information to affect the *operational efficiency* of a facility.

Benefits to implement a CMMS include the following:

- Detection of impending problems before a failure occurs resulting in fewer failures and customer complaints.
- Achieving a higher level of planned maintenance activities that enables a more efficient use of staff resources.
- Affecting inventory control enabling better spare parts forecasting to eliminate shortages and minimize existing inventory.
- Maintaining optimal equipment performance that reduces downtime and results in longer equipment life.

4.5 CMMS Resources

The Internet provides a great resource for identifying CMMS vendors. A simple search under “CMMS” provides links to the many vendors and the resources they offer.

CMMS and EMCS (Energy Management and Control System) Integration

As technology improves and both of these systems develop capabilities, opportunities for integration exist. A good example is with air filtration systems. Traditionally, air filters are changed as part of a time-based PM activity – filters may get changed every 3 months, needed or not. Newer filtration systems made use of pressure sensors to calculate a need based filter change out. Many of these systems communicate back through an existing EMCS and notify the system monitor of differential pressure limit/alarm and the need for a filter change.

The opportunity and capability now exists to “port” this same differential pressure limit from the EMCS directly to the CMMS. This development affords a level of real-time maintenance management, whereby the filter change notification becomes an automatically generated work order scheduled based on need. In addition, this particular filter item is removed from inventory and a re-order placed if necessary. While this example highlights a simple air filter integration capability, the same logic applies to many other systems and equipment for which time-based maintenance can be replaced with need-based maintenance.

4.6 Reference

DPSI. 1994. *Uptime for Windows Product Guide, Version 2.1*. DPSI, Greensboro, North Carolina.