



ABOUT CMMS

1. INTRODUCTION

The goal of a maintenance manager is to employ a management system that optimizes the use of scarce resources (manpower, equipment, material, and funds) to maintain the facilities and equipment that are the responsibility of the maintenance organization. The system should provide for integrated processes giving the manager control over the maintenance of all facilities and maintainable equipment from acquisition to disposal.

The following lists what the system should do:

- Address all resources involved,
- Maintain maintenance inventory,
- Record and maintain work history,
- Include work tasks and frequencies,
- Accommodate all methods of work accomplishment,
- Effectively interface and communicate with related and supporting systems ranging from work generation through work performance and evaluation,
- Support each customer's mission,
- Ensure communication with each customer,
- Provide feedback information for analysis, and
- Reduce costs through effective maintenance planning.

A modern CMMS meets these requirements and assists the facilities maintenance manager with work reception, planning, control, performance, evaluation, and reporting.

Such a system will also maintain historical information for management use. The manager should evaluate management data requirements and establish electronic data needs prior to acquiring a system or additions to, or replacement of, an existing system. The evaluation should include a return on investment (ROI) analysis before investing in additional or new CMMS capabilities. The manager should only acquire what is necessary to accomplish the maintenance organization's goals. The following paragraphs include details of capabilities that may be included in a modern CMMS.

2. OPERATING LOCATIONS

The CMMS may include an application that allows an operator to enter and track locations of equipment (locations in which equipment operates) and organize these locations into logical hierarchies or network systems. Work orders can then be written either against the location itself or against the equipment in the operating location. Using operating locations allows for the tracking of the equipment's lifecycles (history) and provides the capability to track equipments' performance at specific sites.



3. EQUIPMENT

The CMMS may include a module that allows an operator to keep accurate and detailed records of each piece of equipment. This module would include equipment related data, such as bill of material, Preventive Maintenance (PM) schedule, service contracts, safety procedures, measurement points, multiple meters, inspection routes, specification data (name plate), equipment downtime, and related documentation. This equipment data is used for managing day-to-day operations and historical data that can be used to help make cost effective replace or repair decisions. The data can also be used to develop additional management information, such as building equipment downtime failure code hierarchies for use in maintenance management metrics.

4. RESOURCES

The CMMS may include a separate module to track labour resources. This module typically includes records for all maintenance personnel, including their craft or trade categories, such as mechanic, electrician, or plumber. Additionally, this module may include labour rates in order to capture and track true labour costs against any asset or piece of equipment. Some CMMS will allow maintenance managers to also track skill levels and qualifications for each resource to help in planning and scheduling of work. Grouping labour categories into common associations can help a manager assign work to particular shop rather than an individual.

5. SAFETY PLANS

With the emphasis placed on safety throughout Government and industry a capability for safety plans/planning may be included in a CMMS. The following capabilities should be provided:

- Manual or automatic safety plan numbering.
- Building safety plans for special work.
- Tracking hazards for multiple equipment and locations.
- Associating multiple precautions to a hazard.
- Tracking hazardous materials for multiple equipment and locations.
- Once hazards and precautions are entered they should be available for reference and data entry.
- Tracking ratings for health, flammability, reactivity, contact, and Material Safety Data Sheets for hazardous materials.
- Defining lock-out/tag-out procedures.
- Define tag identifications for specific equipment and locations.
- Defining safety plans for multiple equipment or locations.
- Viewing and linking documents.
- Associating safety plans to job plans, to preventative maintenance masters and to work orders.
- Printing safety plans automatically on work orders.
- Allowing tag-out procedures to be associated to hazards or directly to locations, equipment, and safety plans or work orders.



6. INVENTORY CONTROL

An inventory control module may be included to allow an operator to track inventory movement such as items being moved in or out of inventory, or from one location to another. Stocked, non-stocked, and special order items could be tracked. The module should also allow the tracking of item vendors, location of items, item cost information, and the substitute or alternate items that can be used if necessary. Some CMMS recommend and provide the ability to track tools and provide basic tool-room management features as part of the inventory module. This feature will allow work planners the ability to see what tools are in stock and assign tools to various work categories to reduce research effort on the part of mechanics and technicians working in the field.

7. WORK REQUEST

A work request module should be an integral part of a CMMS. The module could provide the capability for a requestor to input a request, such as a trouble call, or it could be entered by the maintenance organization's work control. The data entry screen should be designed for minimal data entry. The work order number could be assigned manually or automatically. A requester could enter minimal data and work control could enter additional information as required. Data should be entered once, and pop-up tables in the system should eliminate the need to memorize codes.

8. WORK ORDER TRACKING

A CMMS must include work order tracking because it is the heart of a work order system. The data should be entered once, and pop-up tables should eliminate the need to memorize codes. The tracking system should provide instant access to all of the information needed for detailed planning and scheduling, including work plan operations, labour, materials, tools, costs, equipment, blueprints, related documents, and failure analysis. Of course, this is dependent on how many modules are installed and how much information has been entered in the system. The manager must evaluate data requirements and the practicality of adding modules.

9. WORK MANAGEMENT

A work manager module may be a part of the CMMS. The module could provide the capability that would let a planner specify which labour to apply to specific work orders and when. The module would permit planning and dispatching.

- Planning—In planning, labour assignments would be planned for future shifts. Each person's calendar availability would be considered when the assignments are made. The assignments would be created sequentially over the shift, filling each person's daily schedule with priority work for the craft. It could even split larger jobs over multiple shifts—automatically.
- Dispatching—In dispatching, labour assignments would be carried out as soon as possible. This system could begin tracking labour time from the instant the assignment is made. The system operator could interrupt work already in progress in order to reassign labour resources to more crucial work.



10. QUICK REPORTING

The CMMS could provide a rapid and easy means for opening, reporting on, and closing work orders, and reporting work on small jobs after-the-fact. Labour, materials, failure codes, completion date, and downtime could all be reported.

11. PREVENTATIVE MAINTENANCE

The following capabilities may be provided in a CMMS to manage a Preventive Maintenance (PM) program:

- Support multiple criteria for generating PM work orders. If a PM master has both time-based and meter-based frequency information, the program should use whichever becomes due first, and then update the other.
- Generate time-based PM work orders based upon last generation or last completion date. Next due date and job plans should be displayed.
- Permit and track PM extensions with adjustments to next due date.
- Trigger meter-based PM by two separate meters.
- Print sequence job plans when wanted.
- Create a PM against an item so new parts have PM automatically generated on purchase.
- Specify the number of days ahead to generate work orders from PM Masters that may not yet have met their frequency criteria.
- Consolidate weekly, monthly, and quarterly job plans on a single master.
- Assign sequence numbers to job plans to tell the system which job plan to use when a PM work order is generated from a PM master.
- Permit overriding frequency criteria in order to generate PM work orders whenever plant conditions require.
- Route PM with multiple equipment or locations.
- Generate work orders in batch or individually for only the equipment wanted.
- Should have the capability to be used with the system scheduler to forecast resources and budgets.

12. UTILITIES

A utilities module may be included that contains detailed information on utilities consumption, distribution, use, metering, allocation to users, and cost. It could include modelling capability and linkage to utility control systems.

13. FACILITY/EQUIPMENT HISTORY

A history module may be included that would contain the maintenance histories of the facilities and equipment. It would contain summaries of PM, repairs, rehabilitation, modifications, additions, construction, and other work affecting the configuration or condition of the items. It would include completed and cancelled work orders. The maintenance history records can be used to support proactive maintenance techniques such as root-cause failure analysis and reliability engineering.



14. PURCHASING

A mature CMMS may also include a Purchasing module to initiate the requisition of material against a work order and track the delivery and cost data of the item when the material arrives. This capability will allow the maintenance manager improved visibility of matters that can impact work planning and efficiency. Procuring required material outside the CMMS can often leave information gaps that can inhibit the effectiveness of work execution and result in redundant parts orderings and non-standard procurement practices. The purchasing module may include many functions such as a vendor master catalogue, invoicing, purchase orders, receiving, and even request for quotations.

15. FACILITIES MAINTENANCE CONTRACTS

A CMMS may contain a contracts module that includes information on maintenance contracts. With other database files, it provides a picture of each contractor's past performance, current loading, and planned work. It could include information on specifications, Government furnished property, quality assurance, payment processing, delivery orders issued, schedules, and related matters. It could cover both contracts for facilities maintenance and support services.

16. KEY PERFORMANCE INDICATORS/METRICS

The CMMS can be utilized to accumulate the data for KPIs for use in evaluating the organization's maintenance program. The maintenance management organization must select the metrics to utilize in establishing their goals and to measure progress in meeting those goals. The importance of selecting the right Key Performance Indicators cannot be overstated. The KPIs must be based on data that can be obtained and provide meaningful information that will be utilized in managing the organization.

17. SPECIALIZED FEATURES

Some CMMS providers have also developed specialized capabilities and features for particular business sectors, functions, or requirements. Maintenance managers today are able to use their CMMS for tracking transportation and fleet inventory, including maintenance history, mileages, lease terms, rates, and accounting data. Other managers are using their CMMS to track deployed assets such as computers and other IT equipment. Through their CMMS they track changes, additions, and movement of equipment, including software inventory on PC. When selecting a CMMS; considering the full scope of asset management options, with a focus on consolidated IT solutions may be a sensible course of action.