

I. Introduction

Maintenance refers to the science that coordinates a set of activities and operations that intends to economically preserve facilities or systems at their designed performance level, these activities include:

- Corrective Maintenance
- Preventive Maintenance
- Replacement
- Emergency Repair
- Opportunity Maintenance

One of the facility manager's responsibilities is to achieve these objectives by properly allocating material, supplies, equipment and labor hours to optimize work performance of the department. The facility manager is also responsible to establish policies or protocols to systematically optimize the resources and the use of the resources available.

With optimal functional levels of the facilities or systems, the institution will guarantee its customers the desired levels of quality, cycle times and response time, this will be achieved by minimizing variability on its processes or product, increase the capacity and guarantee the availability and reliability of the facilities.

II. Institution: South Texas College

South Texas College is a higher learning institution accredited by the Commission on Colleges of the Southern Association of Colleges and Schools. South Texas College was founded in 1993 in McAllen Texas. It currently serves more than 30,000 students with a faculty and staff force of more than 1,800. The institution provides its services with its five campuses located in the Hidalgo and Starr Counties of South Texas.

The Maintenance and Operations Department at South Texas College, is responsible for the Corrective and Preventive maintenance activities at the institution. Having its headquarters at the Pecan Campus located in McAllen TX, from here technicians are dispatched to their assigned location, the following table shows the one way travel distance from main campus to other service areas of the district.

From	To	One Way (Miles)
Pecan Campus	Mid Valley Campus	27
Pecan Campus	Starr Campus	50
Pecan Campus	Technology Campus	5
Pecan Campus	Nursing Campus	7

Table 1

III. Department: Maintenance and Operations “The Challenge”

In early 2010, the facility administrators had a big concern that their current work order system was not productive for the maintenance staff, lacked inventory control, had limited PM scheduling and had no asset management tracking. With the college district being so spread out and growing in size (students and square footage) the facility administrators decided that the need for change was now and immediate.

Upon researching various systems for Work Order Management, the department administrators decided on the one that facilitated the metrics acquisition for process improvement that would minimize variability, complexity and increase capacity.

The implementation of the new Work Order System (CMMS – Computerized Maintenance Management System) took place in the Fall of 2010. The new methods and procedures were received with low expectations of success and resistance from the users which jeopardized the implementation of the system by counteracting the technology. Leadership overcame the resistance by including the users at all levels with the implementation process and the definition of the project milestones.

The department’s successful implementation of a sustainable CMMS has endured over 2 years. The increase in productivity is partly due to the CMMS technology, but is mainly the effect of clear policies and procedures and the acceptance of the staff members on every level. This positive effect is contrary to the paradigm of investing on high dollar technology for quality and quick results. The Operations and Maintenance Department of South Texas College did a time investment of the development of clear policy and procedures that has not only improved the quality of the service but also increased productivity, reduced complexity and variability, but most importantly engaged and empowered personal that guaranteed a sustainable work order management system.

We will include diagrams and graphs that include work order process and inventory charts, etc.

IV. Work Flows and Diagrams For: “The Challenge”

a. Maintenance Management System:

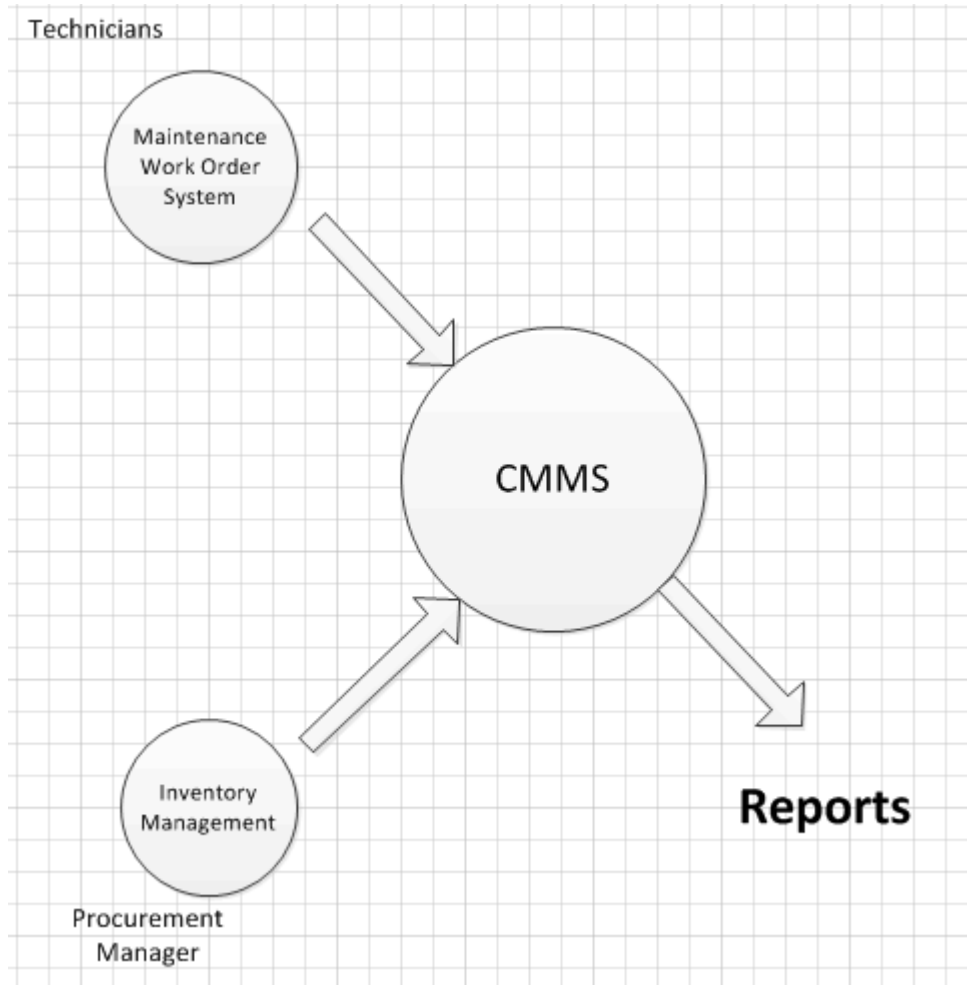


Figure 2

The above figure is a representation of how the CMMS is used by the institution, captures the information from technicians and inventory managers to generate reports on accountability of material, budget and resources. On one end the technicians utilize the Maintenance Work System to manage their work load and material transactions, on the other end the Procurement Specialist uses the Inventory Management section to manage inventory transactions and inventory levels.

I. Analysis: Present State

a. Work Order/Inventory Management Process

The following figure (Figure 3), is a flow chart of the responsibilities of each individual when performing a work order in a supply request context.

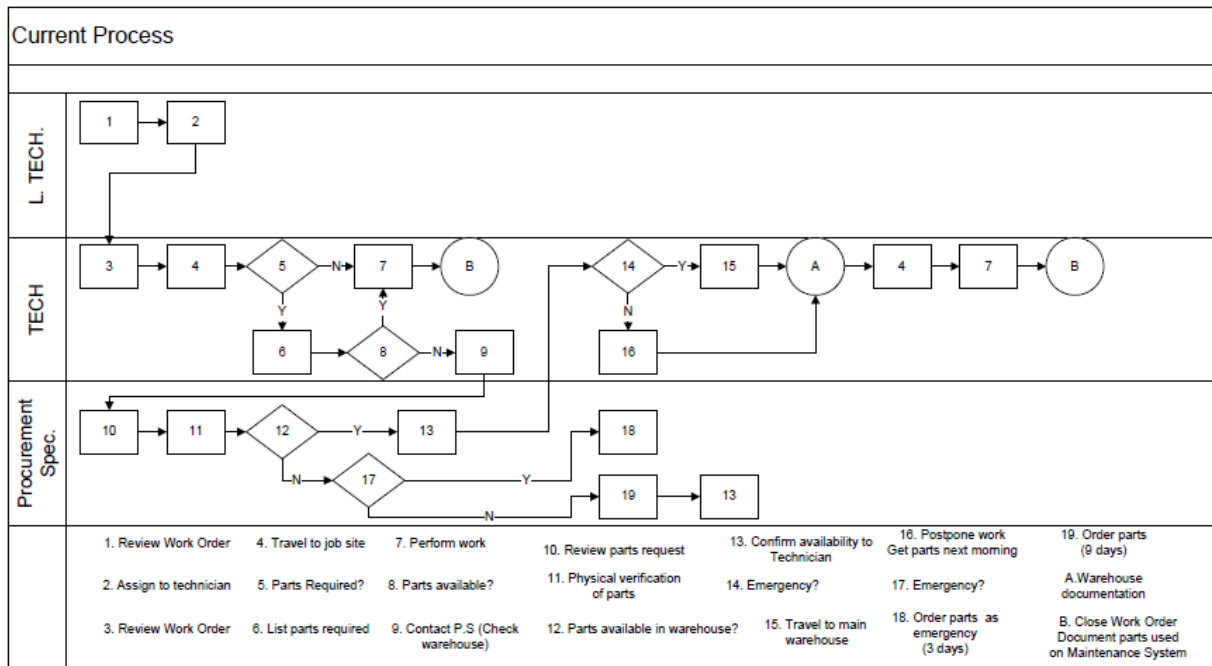


Figure 3

Responsibilities

Lead Technician:

- Review work orders.
- Assign work orders to respective technician.

Technician:

- Log material used and required.
- Assign parts used to work orders.
- Provide proper description of required material.
- Perform Job.
- Close work order, providing relevant information.

The Procurement Specialists:

- Maintain inventory count.
- Re-stock warehouse when necessary to “ensure” material availability.
- Maintain proper inventory levels at all times.
- Review/verification of parts requested.

Process:

After the work order is reviewed by the lead technician, the assigned technician travels to the job site to attend the work request, using the service vehicle provided by the institution. Once at the job site and during the repair, the technician must make the decision if parts are required to complete the request, if parts are not required to complete the work order he must immediately attend this request and “close” the work order by providing the following information (B).

- Date of completion
- Material used
- Hours of labor
- Notes on work performed.

Using the screen on figure 4:

▶ Back to Shortcuts

Journal Notes

✍ New Note

Date	Journal Note
	No Journal Notes at this time

▶ Back to Shortcuts

Transactions

✍ New Purchase Transaction
✍ New Issue Transaction
✍ New Labor Transaction

1 - 3 of total 3 listed

◀ First ◀ Previous 25 Next 25 ▶ Last ▶

Date	Item Number Description	Type Invoice/PO #	Labor	Qty	Cost Each	Tax	Shipping/Other	Amount
12/1/2010	Jorge Garcia	Labor	1		\$0.00	\$0.00	\$0.00	\$0.00
12/1/2010	Armando Soldan	Labor	1		\$0.00	\$0.00	\$0.00	\$0.00
12/1/2010	030003 F32T8SP35 Fluorescent lamp	Issue		6	\$1.27	\$0.00	\$0.00	\$7.62
			2					
Total Labor								\$0.00
Total Sales Tax								\$0.00
Total Purchases								\$0.00
Total Inventory								\$7.62
Total Shipping								\$0.00
Total Others								\$0.00
Grand Total								\$7.62

Figure 4

If the technician does not have the necessary components available to complete a request, he must identify and provide a list of the material required to the Procurement Specialist (PS) who must check that the material is on the inventories database (Step 11). If this database indicates that the material is available (step 12), the PS must physically verify if the component is available, if this is the case the PS must notify the technician of the availability of

the material (Step 13). If the part is not available, the PS must decide if the requested material must be ordered immediately as an emergency which would take an average of 3 days to receive the material (Step 18), or in the case that the parts are NOT an emergency the parts will be ordered in standard time which takes an average of 9 days to receive (Step 19). After the Procurement Specialist receives the parts he must immediately notify the technician of the availability of the components (Step 13). If the parts were available in step 12 of the chart, the PS will notify the technician, who must make the decision if the parts must be picked up immediately (emergency) or can be picked up at a later time (Step 14), if the part must be picked up immediately, the technician must travel to base (Pecan Campus) where the warehouse is located and retrieve the components from the warehouse (Step 15), following documentation protocol (B) if the part can be retrieved at a later time, technicians usually wait for the end of the shift to get the necessary material (Step 16) and then follow the same documentation protocol.

Once the technician has all the components on hand, he must then travel back to the job site and complete the work requested and “close the work order using the maintenance work order system by providing the information mentioned above. (B)

b. Current Inventory Transfer Flow

All purchases done by the procurement specialist are classified as “ warehouse items (WHI)” or as “non-inventory items (NII)”, WHI are items that are considered to be generic inventory items such as capacitors, belts, contactors, relays or any other component that is necessary to carry day to day routine operations. NII are items that are requested by a technician or lead technician to perform a specialized repair, in other words this item will only be used once and there is no need to keep in inventory.

Current Inventory flow:

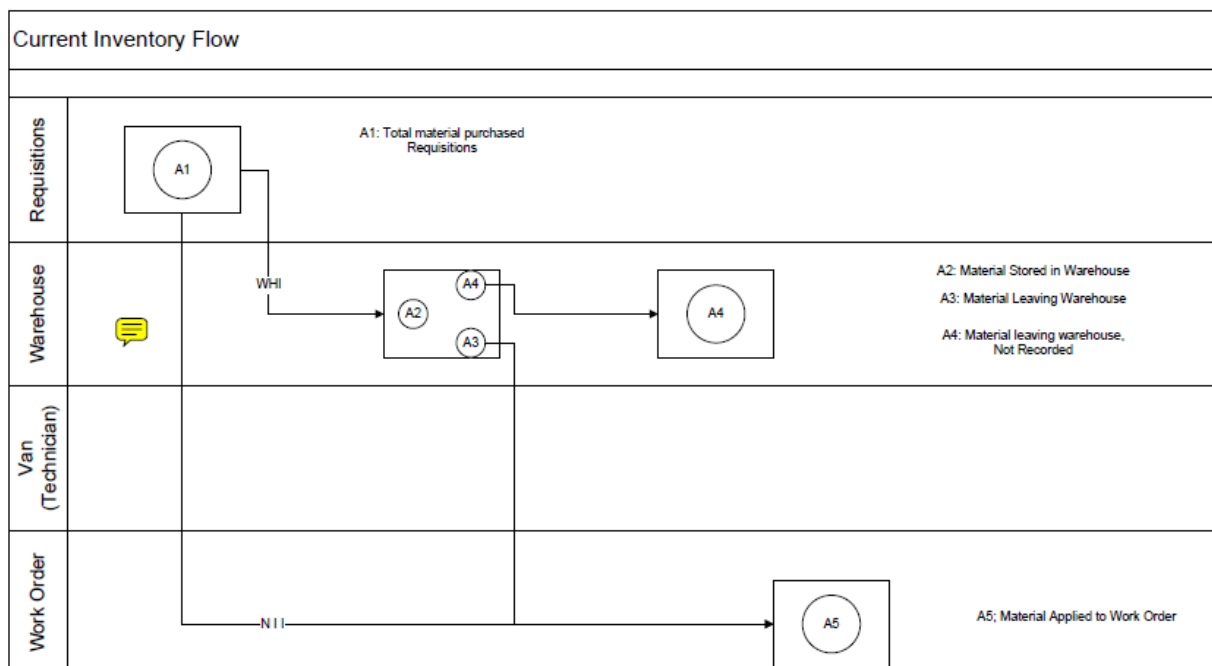


Figure 5

The previous diagram demonstrates how items are transferred from the point of purchase to the point of installation (work order completion) purchases are initiated by the request sent by the technician to the procurement specialist. Once an NII item is received and reviewed by the procurement specialist, the PS charges these components directly to the work order and hands the item to the technician for installation without proper documentation. In the other hand warehouse item take another route. When an item is received is then reviewed by the procurement specialist, then she allocates this material to the trade warehouse. At the warehouse level the parts are pulled out by technicians by following current documentation. Some of these items are properly documented due to the willingness of the parties. However, the majority of the items are pulled out from the warehouse, without proper documentation, or the documentation is filled out incorrectly. At the work order level, parts and components, are charged or used and documented by the technician at the moment of closing the work order.

Our key contributors, in no particular order:

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