

# Selecting a Computerized Maintenance Management System

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Computerized maintenance management systems (CMMS) are required to manage and control asset, plant, and equipment maintenance in today's hospitals. A CMMS is much more than just a way to schedule preventive maintenance (PM). By using a CMMS, you can create equipment logs to record events associated with a piece of equipment; create work orders automatically according to a schedule or manually from service requests; record authorized uses of equipment; and track scheduled services or PMs, training, maintenance history, employee time, downtime of a device, parts inventory, purchase orders, and much more.

Last year, the Biomedical and Engineering Department at Middlesex Hospital in Middletown, CT, started an evaluation of CMMS available for hospitals. The current system in place was outdated and difficult to use. Many of the repairs completed by technicians were not associated with a time charge, the old system wasn't keeping track of the hours spent fixing a device or performing a PM, and there was need for additional software to run weekly and monthly reports. While multiple repairs were completed, no work orders were created and the need for an updated system became more obvious by the day.

## Finding the Right Product

The final cost of the product is a significant factor when picking a CMMS. Operating under a fixed budget, we had to find the right CMMS—one that would perform the tasks needed without stressing the budget. To give ourselves some guidelines we separated features into "Required" and "Optional/Future" (see Figure 1).

These features are just some of the tasks that hospitals need to run on a daily basis. Having an accurate record of the inventory, maintenance history, hours spent on a device, and essential reports is not a luxury—it is fundamental to running a clinical engineering department.

We started looking for a manufacturer to provide us with a CMMS by conducting our own research, talking to other hospitals, and inviting vendors to hold presentations. The criteria for selecting the company were simple:

## Check Points

Lessons learned from implementing a CMMS:

- ✓ Extensive and targeted training is key.
- ✓ The timing between training sessions is important to absorb information.
- ✓ Make sure that training costs are included in the software package.
- ✓ Include the IT department when making a decision.

it has to be a reputable company that has been in business for a while and is specialized in CMMS. Other hospitals were one of our best resources. The Middlesex Hospital biomed team regularly attends New England Society of Clinical Engineers meetings, which attract engineers from other hospitals as well as representatives from other companies, many of whom had insights into different CMMS solutions. We used the meetings to spread the word that we were on the market for a CMMS. This way, many companies would hear about it and competition would be higher; which in turn would bring the price of the product down and increase the number of features included in the package.

## RFP and Final Selection

Based on the features mentioned above, and by talking to other clinical engineering departments, we narrowed our search. Requests for proposals were sent out to selected companies detailing the features we were looking for.

In the meantime, we visited a few clinical engineering departments in southern New England. We saw firsthand how different systems were working and heard about some of their strength and weaknesses. We asked the technicians and other users about their experiences. The CMMS will be used not only by the engineers, but also by managers, technicians, secretaries, volunteers, etc. Therefore, testing the CMMS in another hospital where they have been using it for a while is probably better than just testing it in your own hospital setting for a

Features	Required	Optional/ Future
Ease of use	X	
Close work orders instantly by using a handheld PDA/ barcode scanner		X
Run quick reports, managerial reports, and create customizable reports (inventory, service records, etc.)	X	
Work order request over the web by clinicians		X
Integration with RFID		X
Automatic alerts and recalls		X
Create tasks and planned events	X	
Dynamic/adaptable over the years	X	
24/7 technical support included	X	
Training included	X	

Figure 1. The required and optional features of a CMMS as defined by Middlesex Hospital.

week or so. Additional information can be collected from other users that easily be overlooked.

Different systems had different strengths and weaknesses, and, as a result, it was challenging to find one that will fit every need that our department has.

- One CMMS was easy to use but it lacked technical support and wasn't dynamic. The company was using an MS Access Database, which doesn't support a lot of advanced features such as creation of temporary tables in the database or user-defined functions, views, and procedures. Also, the size of the database is a lot smaller when compared to its peers (MS SQL or MySQL); has a limited number of concurrent users (255); and supports a very limited number of objects. While this doesn't mean a lot to the regular user, it means a lot to the information technology (IT) personnel who would be working with the database in the background.
- Another CMMS was easy to use and could provide good reports, but did not have the capacity to customize reports. This didn't make managers happy, though the technicians seemed pretty satisfied with the software.
- One system provided handheld devices with barcode scanners attached, but the devices were so slow that nobody in the hospital used them. One thing to keep

in mind with handheld devices is that the hospital wireless infrastructure must be able to support them, otherwise they are useless. Also, the handheld's central processing unit must be fast enough and the memory large enough to run the software.

- Integration with RFID was the strength of one system; however, it lagged behind in everything else, including technical support. As RFID hasn't yet been fully implemented at Middlesex Hospital, this strength alone wasn't a selling point.

After a thorough comparison of pros and cons from all the systems and manufacturers, while keeping an open mind, a decision was made on the final selection of the system. The system chosen was a compromise of the must-have features, the price, and the optional/future features. We didn't compromise on the reputation of the company, the ease of use of the system, and 24/7 technical support.

### Implementation and Training

The transition to the new system wasn't as easy as we had anticipated. While the manufacturer helped a lot with the database and the server issues, the transition took more time and resources than anticipated. We spent about two months compiling a list of medical devices and categorizing them. In part because of this up-front work, the implementation phase itself was very efficient. Wizards and other automated entries made the implementation fast and easy, and the software was up and running in no time. We equipped all technicians with a Tablet PC to create and close work orders on the fly as they were performing PMs or doing rounds in the hospital.

We spent two half-day sessions training the technicians on the system, and another four half-day sessions training the managers and administrators. This training was done in the course of two weeks and was very demanding in terms of time, attention, and effort.

Once the training was complete, the technicians felt somewhat confident using the system; however, we soon realized there was need for another training session. This was provided about three weeks after the original training. After the last training the technicians were much more at ease with the system and could understand most of the features it offered.

One lesson learned is that extensive and targeted training is key to a smooth transition and is well worth the expense. Also, the spacing between training sessions

is very important. We realized that we need to give ourselves some time to absorb the information and use the features we learned in one training session before jumping into the next. Had we spaced our training sessions better, very likely there wouldn't have been need for an additional training.

Another lesson is to ensure that the price of extensive training is included in the software package. Most manufacturers will have something included, but it will likely not be enough. Make sure additional training is included in the package, as training can get very expensive.

### Final Thoughts

By updating our CMMS, we now can keep track of virtually everything that happens in the department and have moved away from paper records of service reports. We have been able to determine how much time is spent on certain tasks, can see maintenance activities and materials purchased, and can manage technicians' time more effectively. Also, we have given clinicians the ability to create a work order for us over the web when maintenance is needed, and can respond to these orders more efficiently.

Finding one system that fits your needs is not an easy

task and requires a fair amount of time and resources, as well as some compromise. For any healthcare facility considering a CMMS, take a good look at what we did at Middlesex Hospital and then improve on it. Keep in touch with other healthcare facilities and welcome their feedback on their systems, be up to date on what is available, get input from other departments, attend meetings of your local clinical engineering society and AAMI Conferences, and keep an open mind when making a decision. Finally, remember two important things when purchasing a CMMS:

1. Include the IT department when making a decision. They will give you important information on the server requirements, database requirements, your network infrastructure, etc.; as well as provide you with help when designing custom reports.
2. Share what you learned so that other healthcare facilities can benefit from your experience and we can move a step closer to a better management of healthcare. ■

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# CMMS

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