# The Application of CMMS/EAM in Reliability and Corporate Communication

**An Essay by**
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"A CMMS/EAM cannot support enhanced maintenance productivity without complete and accurate information. Imagine the chaos created by a similar lack of detail in your company accounting information system."[1]

"If there are flaws in your maintenance management strategy, CMMS/EAM will not fix them. More likely the CMMS/EAM will expose those flaws even quicker."[2]

"Most Business People, … without knowing it, see the service world through the lenses of manufacturing goggles. They are influenced by historical traditions in business training, strategy techniques and organizational theory, all rooted in manufacturing."[3]

## Introduction

The introduction of Computerized Maintenance Management Systems (CMMS), in the 1980's, and Enterprise Asset Management (EAM) software, at the end of the 1990's and into the 2000's, provided the concepts of Scientific Management to the Reliability and Maintenance (R&M) industry. The potential benefits to the application of CMMS/EAM are tremendous, when properly selected, applied, implemented and supported.

A properly applied CMMS system has the potential to provide information related to maintenance, parts, scheduling and other functions more effective while EAM systems have the potential to provide this functionality combined with communication with other systems, such as accounting. Additionally, a fully applied system can be used to provide the necessary information for Condition-Based Maintenance (CBM) processes such as Reliability-Centered Maintenance (RCM).

However, a majority of systems that have been implemented, world-wide, have not been effective. In effect, while the vendors state that there are tremendous savings to be realized, fewer than 8% of CMMS/EAM customers have realized those savings following $Millions of dollars and years to implement. In most applications that I have seen, whole new Information Technology (IT) departments are formed and consultants hired to maintain the CMMS/EAM programs. Is the balance of purchasing systems, the cost of skilled IT workers and consultants, as well as the other implementation costs, of value to the organization?

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[1] O'Hanlon, Terrence, A Strategic View of Enterprise Asset Information Management, NetExpressUSA, Inc., 2005
[2] O'Hanlon, Terrence
[3] Head, Simon, The New Ruthless Economy, Oxford University Press, 2003

**The Issue with Modern CMMS/EAM Systems**

European and American studies on Enterprise Resource Planning (ERP), while not CMMS, ERP is the larger system that EAM is part of, identify how the systems are applied.

> *For a business, the implementation of ERP is expensive, disruptive, and very time-consuming. In its 1999 survey of ERP, Deloitte Consulting writes of a 'massive change like ERP' that takes 'up to four years' to complete. Thomas Davenport writes of 'the huge investment required to implement [ERP] at large companies – typically ranging from $50 million to more than $500 million.' The testimony of consultants, and of surveys conducted by consulting firms, provides strong evidence that, so far, ERP has been a poor performer. In a 2000 report on basic ERP, PA Consulting Group has come up with an astonishing statistic: 92 percent of its European respondents 'were dissatisfied with the results achieved to date,' while 'only 8 percent had achieved a positive improvement in performance.' Fifty-three percent of the surveyed companies had looked for improvements in productivity, but only 5 percent had gotten them. Fifty percent had aimed for 'streamlined business processes,' but only 5 percent had found them. Forty-five percent were banking on 'improved information flows,' but on this score only 13 percent were satisfied.*
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> *… On the American side, Computasoft Consulting came up with a similar result, finding in a 1999 survey that 'two thirds of companies have failed to realize the benefits they expected from the leading ERP solution, from SAP.' In yet another survey of basic ERP, which also appeared in 1999, Cambridge Information Networks found that 22 percent of companies 'never' expected to recover the cost of their ERP investments, with some respondents commenting that 'if time and payback are as long – or nonexistent – as the survey results indicate, then something is really wrong.' Tony Friscia, president and CEO of AMR Research, told the Financial Times at the end of 1999 that 'most companies are not doing business differently and have not achieved a result on their [ERP] investment.'*[4]

In 2005, NetExpressUSA, Inc. published a study focused on the R&M side of this industry, CMMS/EAM. The result was that "57% of recent survey responses reported that the CMMS/EAM implantation failed to generate the anticipated return on investment. Only 20% characterized their CMMS/EAM implementation as successful."[5] The survey also identified that "only 20% of respondents track 100% of maintenance and repair work in their CMMS/EAM."[6] The other primary issue is that many of the CMMS/EAM software vendors viewed all processes based on their experience and the basis of their systems: Finance.

"A CMMS/EAM cannot support enhanced maintenance productivity without complete and accurate information. Imagine the chaos created by a similar lack of detail in your company

[4] Head, Simon
[5] O'Hanlon, Terrence
[6] O'Hanlon, Terrence

accounting information system. You must track 100% of your maintenance activity and 100% of maintenance and repair spares in the CMMS/EAM to get the greatest return."[7]

**The Cause of the Disconnect**

In ERP, CMMS and EAM, even in customized systems, most are Commercial-Off-The-Shelf (COTS) items. This basically means that one of the concepts that are hard to accept is that you must change how you do business in order to match what the vendor feels are 'best practices.' These best practices are usually formed around the financial portion of the business and tend to put CMMS/EAM floor-level practices as a last thought.

In effect, to be successful, the business and maintenance organization must change the way they do business. The NetExpressUSA study identified that 61% of businesses had to change their maintenance work processes in order to fit the selected CMMS/EAM.

"If you suffer from poor maintenance work practices, a CMMS/EAM will simply automate the process so disaster happens faster and with less effort. If you automate a dysfunctional process, you simply create a more efficient dysfunction. Explore, improve and document maintenance work process before implementing a CMMS/EAM."[8]

Skilled trades R&M professionals often view CMMS/EAM systems with suspicion. In the past, the skilled tradesman was a firefighter with a majority of their business being reactive repairs. The ego of the R&M professional was fulfilled with the victory of each 'save' of equipment and process. With a greater financial view of the company, upper level managers realized that an average of 40% of the cost of their business was related to the R&M effort. As a result, those corporate managers re-enforced decisions to implement CMMS/EAM strategies but, as is the case, left the R&M departments with few resources, let alone input, into the selection and implementation of the programs.

With very little support and buy-in, many resist the application of the program. In fact, many view the application with suspicion, concerned that 'big brother' is watching over their every action.

> *Maintenance and service have traditionally been unrepresented in the corporate boardroom and largely ignored business functions due to their own peculiar rules. But never before has this presumed cost center been so crucial to revenue and profit margins. Maintenance alone can consume upwards of 40-percent of an operational budget, and yet it often seems under-funded. As Jack Welch, the now retired Chairman of General Electric, once said, 'If you consider services aftermarket, you're probably treating it as an afterthought.'"*[9]

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[7] O'Hanlon, Terrence
[8] O'Hanlon, Terrance
[9] Wray, Ian J., "Best-of-Breed Versus Integrated EAM for Asset-Intensive Industries," Indus International, 2005.

Maintenance management relies upon the accuracy of the CMMS/EAM system to provide accurate information to perform the tasks at hand. Some of the R&M skilled workers view the CMMS/EAM system with suspicion. Executive management views the application of a software package to maintain and monitor the costs associated with R&M as the solution to improve to the 40% operational costs associated with maintenance.

**The Impact of Software on the R&M Philosophy**

One of the most common issues with the application of the newer EAM systems, and in many cases, the CMMS systems, is the selection without regard to the actual application by maintenance.

> *For many organizations, the solution has been to avoid integrations altogether by selecting a single vendor's complete suite of enterprise applications. Although the intent is not to disparage enterprise applications, the reality is that while they offer application breadth, they may not offer sufficient application depth (depending on your specific needs). The result is a compromise in application functionality in order to satisfy the needs of the broadest number of users.*
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> *However, in asset-intensive organizations, this compromise may have dire consequences. All too often, the maintenance department is forgotten and left to use whatever functionality comes along with the rest of the enterprise suite and usually has little input into the selection process. This often results in resistance by the maintenance staff and ineffective use of the enterprise suite. In some situations, the maintenance department may even revert to using inefficient paper-based systems. Thus, these asset-intensive organizations should not ignore the needs of the maintenance department – especially when they're the ones responsible for maintaining the assets that produce the revenue stream.*[10]

The resistance is a double-edged sword for the maintenance organization. Management relies upon the CMMS/EAM system to provide information for allocating resources. In one of an increasing series of common occurrences, I was performing a site industrial survey. During the evaluation of the powerhouse of the site, I asked how they utilized the corporate CMMS system. The powerhouse maintenance supervisor, a skilled tradesman, proudly showed how effective his maintenance program was. However, he warned that the program was rapidly decaying into a reactive program because management was cutting the number of people. He had just dropped another five and he did not know how he was going to meet his planned maintenance goals. I then inquired about how their times were reflected in the CMMS system. He stated, simply, that he felt that the use of the CMMS program was to force them to do things too fast and to monitor their work, so he did not use it and did not promote its use. They received their materials through common blanket purchase orders and only used the CMMS to process emergency work orders for repairs (ie: motor rewind and major pump repairs). When some of the repairs were not as critical, instead of sending them out, they would perform them in-house.

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[10] Mendoza, Joseph, "Serving Up EAM Integration," PopWare, Inc., 2005

In effect, in this instance, management was unaware of the number of hours were required to maintain the powerhouse and were reducing personnel via attrition, in such a way that met their union agreement requirements. The supervisor was unaware of the impact, had an ingrained paranoia about the use of the system and had not been trained in its use and benefits. I have seen enough of these to know that chances are good that the management attitude fed into the paranoia which was re-enforced with the knowledge that the local manager in-charge and the corporate managers in-charge were unaware of this massive breakdown in the system.

In another survey, I sat in a maintenance meeting where a combined management and worker team discussed plant maintenance issues. I was impressed until the managers kicked out the tradesmen and commenced to discuss the status of their facility in preparation for a report to corporate. Using red-yellow-green charts, they scored themselves 'green' on their CMMS implementation. During the survey, with a skilled trade acting as the guide, I noted that all of the CMMS terminals were locked, even though the philosophy was that anyone should be able to enter a work order. He laughed and explained that there had been no training, to date, and that most of the equipment was still not included in the system, even though the program had been in the plant for close to five years. The system was being used for planned maintenance and parts only. At the corporate location, I discovered that they were under the impression that the CMMS had been fully implemented.

As a third case, in an EAM application, during a site survey, the maintenance manager was proud of his percentage of completed PM's. During the walk-through I noticed a number of issues including: Broken equipment had not been entered into the EAM, and, the maintenance force concentrated on smaller non-critical PM's first, in order to keep the completion rate up. The company's reward system focused on completed PM's as recommended by their EAM implementation consultant.

During a site survey, performed prior to meeting with the plant maintenance supervisor as he was on vacation, I noted a high rate of leaking pump seals in process pumps (high rate = 100%). There were systems of water hoses pouring water over the pump shafts in order to keep the product from damaging the shafts or getting into the motor bearings (although water was!). When brought to the maintenance manager's attention, he pulled up a work order screen on his CMMS system and announced that he only had a few pump seal work orders and that it couldn't be that bad. I walked through just one building and took pictures of over 65 pumps that were leaking product onto the floor and passageways. When presented, he was shocked that there were so many. It later turned out that the purchasing department, based upon the high rate of seal failures (average life of 18-24 months) decided to save money by changing from double to single seal cartridges. While reducing the cost by approximately half, they also reduced the life to about 4-6 weeks per seal. The maintenance staff, already burdened by a primarily reactive maintenance program, gave up entering work orders for the pumps.

A West-Coast amusement park has suffered a high rate of injuries and death that have been related to maintenance. In a recent news article, it was noted that the company had implemented an RCM program using just maintenance records and failure rates without

including maintenance staff. As a result, maintenance staff was reduced and redundancies removed. Could it be that they had incomplete information in their maintenance and failure history?

Finally, during a study on the impact of electrical motor diagnostics, we compared the detection of potential faults to the records of sixteen site locations. The very first thing that stood out from the evaluation of 8-10 months of records, was that the information was extremely inaccurate. The extreme at one end was that virtually no work orders had been entered into the system by one site, where we were intimately aware of numerous issues, and the other extreme where every detail of daily maintenance was entered into the system. The good news, for us, was that the results were very conservative and that we knew that our success numbers were very high. The bad news was that we were also involved in successful combined maintenance/management RCM and maintenance effectiveness reviews that relied on this data for success. We were now aware that the data that we needed to rely upon was completely unreliable and that our RCM and MER success rate could be much higher.

**Conclusion**

CMMS/EAM software systems provide a significant opportunity for the R&M industry. However, to date, the success of these systems has been abysmal. The result has been a greater gap in the ability to communicate between maintenance and management. A number of conclusions and recommendations can be drawn for success, however. These we will present in a later essay.

In the next essay, we will cover personality and reward systems and their impact on communications.

**About the Author**

Howard W Penrose, Ph.D., CMRP, is the President of SUCCESS by DESIGN, a reliability and maintenance services consultant and publisher. He has over 20 years in the reliability and maintenance industry with experience from the shop floor to academia and manufacturing to military. Dr. Penrose is a past Chair of the Chicago Section of the Institute of Electrical and Electronic Engineers, Inc. and is presently the Founding Executive Director of the Institute of Electrical Motor Diagnostics. For more information, or questions, related to this article or SUCCESS by DESIGN services, please contact Dr. Penrose via phone: 860 575-3087 or email: howard@motordoc.net.