Maintenance Information Management

Are you managing information smartly? If at all..

In our maintenance pyramid of excellence framework, Information management completes the control elements. This element is about how well we manage the information we produced and collected in the process of managing our maintenance, and also how well we utilize this information to enable more effective and efficient maintenance practices.

The recent edition of the economists featured a comprehensive special report on managing information. In it, the economist argues that with current advancement in the information technologies, data are captured everywhere, everyday in almost all aspects of human endeavor. So information has gone from scarce to superabundant. The world now contains an unimaginably vast amount of digital information which is getting vaster ever more rapidly. This makes it possible to do many things that previously could not be done: spot trends, prevent diseases, combating crime, and, as the economist puts it, "predicts when equipments are going to fail"

So, as advanced information technologies have become readily available for many maintenance organizations to utilize, the challenge should now become how to select the right and relevant data; and how to interpret those data into information and decision we can use to improve our processes and decision making. Sadly, this is not necessarily true for most maintenance organization in Indonesia. We see that many are still struggling defining, capturing, and validating the right data in their system. Let alone using these data to their benefit to speed up the maintenance workflow or even supporting the use of it in various analyses to enable better maintenance decisions.

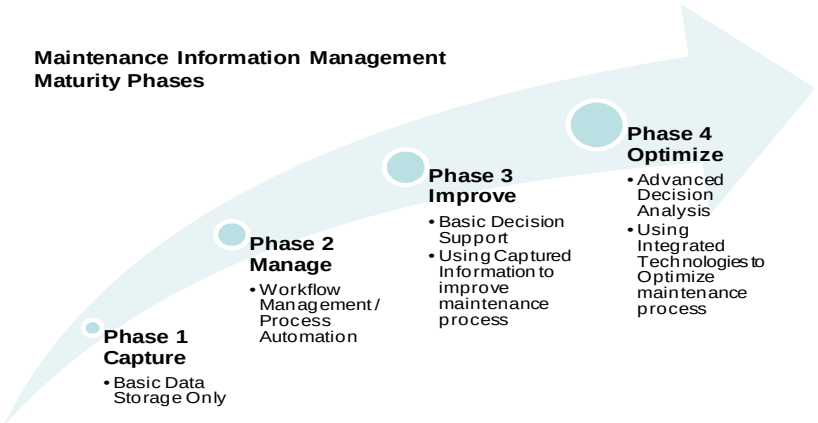
So, if good maintenance information management drives good and effective maintenance practice. This in turn enables company to become more profitable and stay competitive. Isn't it time for you to ask whether you have good maintenance information management practices in your organization? If you would like to know what good maintenance information comprise of, or where your organization stands, please read on.

What is Maintenance Information Management?

It goes without saying that to achieve maintenance excellence one needs to firstly manage the maintenance function effectively. And good information goes a long way in ensuring the effectiveness of a management function. As such, in our various assignments, reviewing and improving maintenance organizations, we also look at how well the particular maintenance organizations manage their information. That is, looking at (i) how well each organization keep **tracks** the various information it has available within the asset system and the organization, and (ii) how extensive does the organization **use** and synthesize those tracked information to produce and execute well informed decisions.

Advancement in information technologies has enabled the achievement of the two objectives mentioned above (to comprehensively track and use maintenance information) with greater efficiency and effectiveness. In most maintenance organizations, accomplishment of those objectives is done through an integrated system solution known as the computerized maintenance management system (CMMS). Popular CMMS solutions includes: SAP, BAAN IV, Ellipse, Maximo, and Enterprise One. The typical CMMS solution offers comprehensive modules that cover a broad range of functionalities from asset register, work management, inventory, and purchasing module, to resources, labor, and even production calendar. All with financial integration option to a financial system/module. In addition to the CMMS, there are also a great variety of advance technologies already available for the maintenance function to significantly improve its performance. This include, condition monitoring devices, modular maintenance system, expert system used to support maintenance decision making process, and advance maintenance packages that goes beyond the traditional CMMS, covering an even greater functional scope. These are also part of good maintenance information management enablers for best practice.

In general, the degree to which a maintenance organization track, manage, and use information can be categorized into 4 maturity phases which also reflects the extent of information technology utilization within the practice.



Phase 1 – Capture: Basic Data Storage Only.

Maintenance organizations in this phase mainly capture and maintain data just as they are. The organizations may have an advanced CMMS. However, they are only using the system to store basic information and digitizing their maintenance related forms. Amongst others, typical characteristics of organizations in this phase include:

- Equipment register exist and may be in the form of asset hierarchy together with location register and or other related attributes. Associated costs for the equipment may also be registered as historical information.
- Work orders may be used and completed in the CMMS system but recorded only after the fact and is not used in driving the maintenance work process.
- Equipment related spares may be registered in the system in the form of MRO spares catalogue. However, the spares management module is probably not integrated such that purchase orders and goods issues are not linked to the related work orders.
- Other functions' forms (such as purchase orders or work permit) may exist but as stand alone, non integrated forms.

Phase 2 – Manage: Workflow management / Process Automation.

Organizations in this phase are using the information technology infrastructures to manage their maintenance activities and drive the work flow of the maintenance processes. Although the CMMS utilization may vary greatly from organization to organization, the typical practice characteristics of those organizations in this phase are:

- Automation of the work order management process from identification of work through work request, work approval, work order creation, job estimation, work planning, scheduling and assignment.
- Whenever required, the process also calls on/initiates other linked supporting function such as material / spares reservation and / or purchase requisition generation, as well as finances and human resources module.
- Utilization of the planning & scheduling modules. With predefined equipment parts list, the CMMS infrastructure helps maintenance organization to better prepare for major overhaul / turnaround.

- Maintenance activities efficiency reports, including costs may be produced easily from the system, and becomes the basis for management control.

Phase 3 –Improve: Maintenance Efficiency and Effectiveness

Organizations in this phase are using the information technology infrastructures not only to drive and manage the work flow of the maintenance processes, but also to use the captured information to improve the maintenance process. This is done by evaluating and analyzing the captured information to enable better decision making throughout the process. Both to improve the efficiency of the maintenance effectiveness and the effectiveness of the maintenance practices. Thus, in this phase begins the development of maintenance knowledge database which will become the most important intellectual capital of the maintenance organization. While the organization may choose to outsource the actual maintenance work, this knowledge should always reside within the organization who owns the asset. Other typical characteristics of organizations in this phase include:

- Integration of the Failure Mode Effects Analyses database which is linked to the asset register/ hierarchy and maintenance policies.
- Proper work order close out with accurate and meaningful data including failure cause history and other work related information such as parts usage, actual work-man hours executed which enable and prompted actions for improvement analyses.
- Incorporating properly defined and comprehensive performance measures for both assets and maintenance activities which will become the basis for evaluating future improvement needs.
- Utilization of reliability engineering tools in the attempt to process captured data info usable information that helps support improvement of maintenance policies.
- Periodic review and analyses of failure and work information to improve PM program, planning & scheduling process, and execution quality.
- May incorporate the use of other external devices to capture additional information that will enable better decision (although processing of this information may still be done externally to the system and manually). These external devices may include, condition monitoring devices such as vibration analyzer, oil sampling or others; and may involve the use of data warehousing software to process these data.

Phase 4 – Process Optimization

This is the basis for best practice. At this stage, the organization has become very efficient not only in capturing the required data but also in processing them into information that leads not only to better decision but better decision fast. The right decisions at the right time improves the planning process as it provides buffer time to deal with uncertainties and unforeseen anomalies which has become the norm in the physical asset maintenance world. Hence, Organizations in this phase seeks to continuously optimize their infrastructures by implementing proven solutions that enable them to improve decision making in maintaining their assets. Examples of this practice are:

- Utilization of advanced tools or expert system in processing knowledge based information into better decisions. Example of this practice include the use of an Advanced decision support system called EXAKT which analyze various condition monitoring data and combine them with asset failure data to determine the most optimal model to predict when equipments are going to fail related to its age, condition, and maintenance interval.

- Integrated, knowledge based application with various multi linked information databases. An example of this practice is to include all related information of your physical assets from basic data, to strategy, historical failure information, including historical condition data and repair history which will then provide easy information access for the analyses.

- Combining the two points above with the use of built in algorithm model and rule based routines for automating and managing maintenance decision making process which enables execution of the right decision (decision to repair/replace) at the right time.

To realize this phase, organizations would normally need to have technology enabler. An example of this enabler is the EXP enterprise software solution which delivers results by formally documenting and deploying the asset reliability strategy, transforming diverse sources of asset condition data into a single, real time view of overall asset health to support proactive asset management. This software solution enables operation and maintenance altogether to have **"The power to make informed asset care decision with real time information"**. To learn more on EXP enterprise please download the brochure at this web link <http://www.relogica.com/main/statics/48.>

The maturity profiles described above should provide enough illustration on the evolution of information management practices within the maintenance function and on what is available as best practice. However, as information technology development is expanding at unprecedented rate, we can be sure that this best practice will soon be surpassed by another best practice enabling technology that will change the way maintenance is performed. As organization trying to achieve excellence, we should be asking, have we been utilizing technology to our benefit? Because our competitors might.

How good is your maintenance information management practice?

Does your maintenance organization promote good information management practice? If you are still uncertain on where your organization stands with regards to the maintenance management best practices, please find below more indications of good Information Management practices. Do you know if your organization has these characteristics?

- A fully functional maintenance management system exists, which is linked to the plant financial and material management systems.
- Our maintenance and materials management information is considered to be a valuable asset and is used regularly. The system is not just a "black hole" for information or a burden to use that produces no benefit.
- Our maintenance management system is easy to use. Most of the maintenance department, especially supervisors and trades, has been trained on it, can use it and do use it.
- Our planners / schedulers use the maintenance management system to plan jobs and to select and reserve spare parts and materials.
- Parts information is easily accessible and linked to equipment records. Finding parts for specific equipment is easy to do and the stock records are usually accurate.
- Failure mode database is integrated within the system and linked to the equipment hierarchy to keep track failure events.
- Scheduling for major shutdowns is done using a project management system that determines critical paths and required levels of resources.
- Condition-based maintenance techniques are supported by automated programs for data analysis and forecasting.
- Reliability engineering tools are used frequently to analyze failure history and revise the maintenance strategy.
- Expert systems are used in areas where complex diagnostics are required.

If there is a specific question you need to clarify on these good practices, please visit our website, or contact us through our address below:

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