

IT for MRO

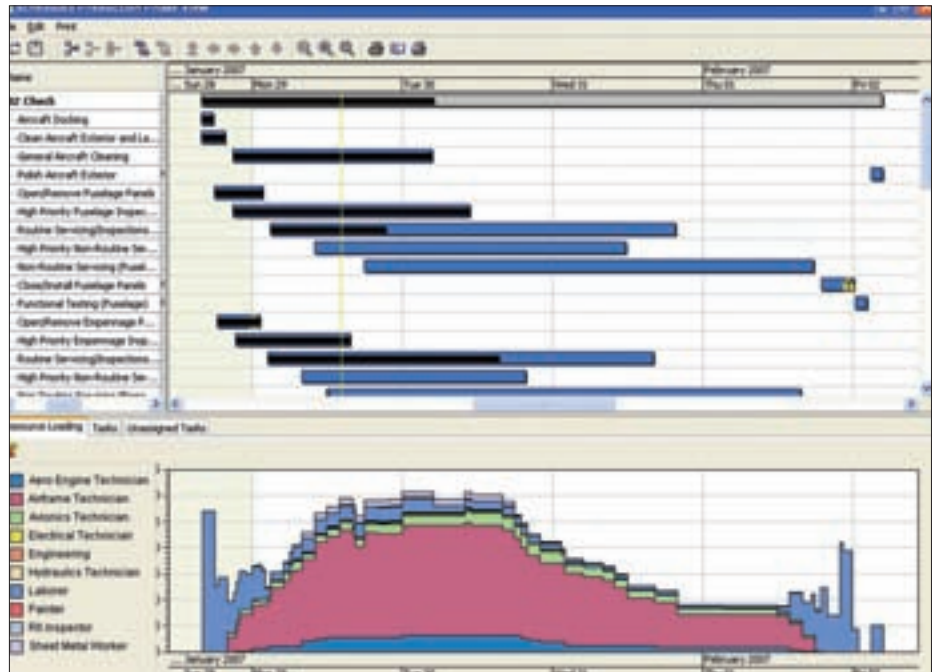
Russ Halliday, a product manager at Mxi Technologies, identifies the requirements of an effective IT solution for the MRO industry.

The role of IT within the aviation maintenance world is well understood. For many years, systems have existed to support the storage and management of information and data within the enterprise, while sustaining the myriad processes that encompass the practice of managing and maintaining aircraft assets. However, in the current environment of fierce competition and high fixed costs, airlines, manufacturers, and independent MRO service providers are placing additional constraints on their IT infrastructure. In order to achieve better efficiency, maintenance organisations are demanding that their information technology not just support existing processes, but deliver higher levels of efficiency and productivity to the organisation.

In order to see information technology drive significant gains in organisational performance, a system (which could be either a single solution used for a very distinct business function or the integrated IT solution spanning the entire organisation), must be designed with a hierarchy of productivity enablers in mind.

The foundation: business processes

Forming the base of the hierarchy are the business practices on which the software is modelled. It stands to reason that if the processes that govern the way the software or integrated system operate are flawed, the software itself can only suffer. Slick



An efficient interface will avoid burdening the user with superfluous or indigestible data.

technologies, beautiful user interfaces and astounding automation will all be constrained by the very practices that they are intended to model. In order to achieve the best possible productivity gains, an organisation must do the things that will enable them to be most productive.

Establishing this critical foundation is where most MRO system vendors fall down. Many currently available systems are built on standard MRO practices from decades ago, while others are simply ERP or MRP systems with a fresh coat of paint. In either case, the limits of the systems will be obvious — the software cannot exceed the capabilities of the old processes they were intended to support. Costly workarounds, customisations and integrations often result from software that does not fit with more streamlined processes or established best practices.

For this exact reason, process-independent software solutions are of no help. Many current MRO software systems are simply ask-and-answer systems: they store data, which users can retrieve as they see fit. In theory, this would enable the software to be developed independently of any particular process; the user would need to be aware of the business processes that drive his or her need for data.

Unfortunately, this philosophy is riddled with problems. First and foremost, good workflow and effective user

interfaces are impossible if the software is not based on what the organisation is trying to accomplish: users will invariably be stuck trying to find and extrapolate information, rather than having the system present the information they require, when they require it. It is not hard to imagine how this will lead to very large productivity losses. Almost as problematic is the fact that a process-independent design severely limits what can be accomplished via automation, for the simple reason that automation is best applied to facilitating workflow (which is predicated on understanding the fundamental processes of the business, as we will see later).

It is imperative, then, when updating an IT infrastructure, to ensure that the software vendor (or vendors, in the case of a larger-scale initiative) has built its (or their) system on a foundation of sound business practices. After-the-fact changes to the fundamental business processes on which software is built are generally harder to make than changes to the other tiers of functionality, because when those business processes change, the subsequent layers in the hierarchy must also be rethought.

The second tier: workflow

The second stage in the software design hierarchy represents the workflow of the system. Once we understand how the

organisation needs to behave, we can evaluate properly the way that information must flow throughout the system in order to achieve the organisational performance toward which we strive. This is where “the rubber hits the road”, as we are now transitioning from the abstract concept of organisational process and into the realm where real people do real work. What information does a person require to do their job? What other people or departments do they rely upon? Is this a reactive role or a proactive role? These are just some of the questions that govern the flow of information through the system. In order to provide productivity enhancements, the system must present users with the information they require, when they require it — the user should not be in a position of having to chase down the information needed for their everyday work.

Many existing systems provide strong workflow support within a single module of the application. For example, many ERP-based systems have a very strong procurement workflow: the lifecycle of the quote and purchase order are well understood, and the system does a very good job of tying together the various people required to create, authorise, issue and monitor the purchase order. However, there is a shift within aviation enterprises toward focusing not only on how well the information is served within a department, but also on how well it is shared across departments.

To build on our procurement example, it is increasingly the case that customers demand software within procurement that integrates neatly with maintenance and materials. A request for a part from maintenance must be met by materials personnel, who, in turn, may or may not require procurement to find the part. When delays occur due to a vendor’s inability to supply the part in a timely fashion, the materials and maintenance personnel must be made aware — without having to “hunt and peck” through the software. In a system with smart workflow management, these critical events are tied directly into a user’s day-to-day activities within the system; they do not need to actively monitor for such issues because the system informs them directly that action is required.

This is how a system becomes truly integrated. It is not enough that one department can see the activities and status of another; the software system needs to recognise the fact that many activities span different departments in a way that is interdependent. This interdependency must be modelled in the software to see truly superior productivity gains, as it eliminates silos of information from forming, allowing efficient distribution of data and information throughout the enterprise.

The third tier: automation

Once workflow is well-understood, opportunities to automate activities become evident. Many activities performed in today’s maintenance and materials environments are quite repetitive in nature and require little human decision-making. Clearly, this is not where an organisation wants its personnel to be spending their time — people should be able to concentrate on making the real choices and decisions that allow their business to operate effectively. Additionally, activities such as optimisations and complex calculations can easily be performed quickly and accurately by a computer. Again, these are obvious candidates for automation. As technology and computing horsepower advance, so too do the opportunities to leverage automation. A major driver of organisational performance is ensuring that personnel are able to focus on the core aspects of their jobs.

Automation can also be used to augment workflow. For example, take a simple integrated interface between a flight operations system and a maintenance, materials and engineering system. The operations system provides flight completion information, along with real-time aircraft utilisation. This is processed by the maintenance system to project new deadlines for upcoming maintenance. These projections, in turn, are used to establish stocking levels in the warehouse. These stocking levels can be self-maintained by the system: should a level go low, the system drafts the purchase request or purchase order to replenish. These activities require, at most, verification or approval by users. The user should not be required to go through all of the steps manually.

There are many such opportunities to

deliver significant efficiency and productivity gains to the users of the system. However, it is impossible for vendors to achieve useful automation without a strong workflow engine “under the hood”, for the simple reason that automation is going to provide the best results when it is used with a solid understanding of how information moves through the enterprise. When workflow is automated in an intelligent manner, wasteful non-productive time is reduced, allowing users to focus on their primary tasks.

The pinnacle: user interface

Central to doing those core tasks well is ensuring that the interfaces with which the user must interact are efficient. Sophisticated automation supporting a perfectly optimised workflow based on the most sound of business practices will still fail if a user cannot properly interact with the system.

There are many ways in which an interface can be made effective and efficient. It all begins, however, with an intelligent design. A good user interface will provide the user with the information they need, when they need it, without needless hunting around. By the same token, an efficient interface will try to avoid encumbering a user with more information than they can possibly use or digest. This is a difficult balance to achieve.

A good interface must also be developed from a strong technology base. Leveraging web-based technologies allows for easier deployment, updating and access to users. The familiarity of the web enables users to become proficient with the system faster, and the scalability provided by a web-oriented architecture ensures that performance will continue to be acceptable as the enterprise grows.

In order to provide large leaps in organisational and personal productivity, MRO IT vendors are being challenged to design their software intelligently from the bottom up. Understanding how efficient business processes guide workflow, automation and ultimately the end-user experience is critical to designing a next-generation software solution. Vendors that commit to these principles will provide the solutions that can keep an MRO organisation running smoothly and efficiently for many years.