

Smaller Vendors can Still Provide Relevant Business Systems Part Four: MRO and Spare Parts Management

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Service Parts Management

Relevant Business Systems, (www.relevant.com), a privately-held San Ramon, CA-based provider of *enterprise resource planning* (ERP) solutions that helps mid-size and large *aerospace and defense* (A&D), *engineer-to-order* (ETO), contract manufacturing, *maintenance repair and overhaul* (MRO), and like project-oriented manufacturing companies to improve their business might be a true example of a focused niche vendor. Relevant, which has a focus in the above closely related markets, has thus recently captured a significant market and mindshare in the segment, particularly given that several US-based ETO-like companies have thereby decided to partner with the vendor by selecting the flagship **Relevant ERP** (formerly **Integrated Financial & Manufacturing Control System [INFIMACS II]**) system.

Service or spare parts have lately become both a blessing and a curse for many manufacturers. On one hand, MRO activities and aftermarket service parts use or sales can generate additional revenue streams (even at a multiple level of original product sales) with high margins, and contribute significantly to corporate profits and thus offset typically lackluster growth in other operations. Yet, on the other hand, these companies must maintain large inventories of expensive, slow-moving parts that are susceptible to obsolescence, to satisfy customer demands for immediate delivery and action. The need for better service parts management is finally gaining top-level management attention in many A&D companies since excessive carrying costs and obsolescence losses are being recognized as an unexploited opportunity for savings and a better bottom line performance.

The situation becomes even more complicated with *rotable parts*, such as interchangeable elements of an aircraft that are removed, rebuilt, or reinstalled, almost as a rule always on a different aircraft. In this industry where every nut and bolt is important for safe operation, it takes an immense attention and effort to track

interchangeable components and subassemblies for costing, replacement scheduling, and time-to-failure prediction. A&D companies design low-volume, high-cost products for high reliability, but still maintain stocks of complex and expensive spares, since in this industry, the impact of any failure is large and requires adequate stocks of parts at several locations for rapid replacement in case of repair. On one hand, minimizing the number of new parts introduced into the market (and subsequently into inventory) should be a major aim, particularly as parts face obsolescence from new product introductions, but, on the other hand, rotatable parts and harvesting repaired components only add to the complexity and efficiency of this process.

For a detailed discussion see [MRO and Spare Parts Management](#).

Relevant Response

In order to meet the needs of airplane service companies, Relevant has long spruced up its lot and serial tracking capabilities. Key to this enhancement is the so-called *tail effectivity*, which permits users to tie every part (within part lists and diagrams) on a plane back to that one entity. Serial number (tail) effectivity for the aircraft or aerospace industry is enabled since within Relevant ERP, a table carries information on each serial or tail number for each item used, including the original date such number was added, received, or stocked, as well as item information, such as the original vendor lot number, inventory quantities, weighted average costs, and the last inventory adjustment date.

The MRO companies also have very stringent requirements they must meet regarding tracking parts and condition codes. This functionality allows to match demand by item condition against inventory by item condition, and it also allows for inventory management and MRP-based supply planning by condition code. While these functionalities may sound ordinary and appear to be offered by many vendors as 'supported' when responding to RFIs, subsequent product demonstration often reveals the need for some tweaking or even a major modification in order to satisfy stringent customer requirements. The devil is always in the details.

As an example, the native ability to run MRP by condition code is not a feature typically found amongst a majority of mainstream ERP systems. To enable an ERP system to track the condition of a component (e.g., new, overhauled, once used, refurbished, or a combination of these) and to restrict mixing inventories of materials with different condition codes, would require a colossal modification. When a system does not have this condition *code capability*, the MRO operation will then need to use multiple item numbers. This work-around causes confusion and significant problems

in terms of planning, work order supply or demand management and it creates a big opportunity for bloated inventory and for mistakenly using the wrong item condition in a customer's repair if work order substitutions are not always carried out precisely. It can virtually invalidate the initial reason the company purchased the ERP system in the first place.

MRO Organizational Flow

Also, the operational flow of an MRO business is very different from the typical manufacturing company, and this capability for both planning and costing is critical to properly manage and represent costs, determine pricing, and portray margins in an MRO company. Without the condition code capability by item it is extremely cumbersome to maintain multiple item costs for the same item or to plan it appropriately. Conversely, with this capability there is no need for workarounds in regards to item planning or costing. Namely, when a single item with multiple conditions such as "new", "used", or "overhauled" exists within the system, it allows each item or condition to be uniquely planned and inventoried, as well as carry its own cost.

Another example would be that Relevant ERP can advise users if any given part revision can be mixed in inventory with other revisions or shipped for a particular order. Each *revision level* indicates, on a scale from 1 to 99, a specific item's fitness for inventory mixing or shipment. During an issue or shipment, ERP reviews whether or not the fitness number associated with the location allows specific items to be placed into inventory or shipped. As products are revised over their life cycles, certain combinations of features will not coexist properly. Using the revision level feature, users are assured that the system is determining if the lot or serial number can be mixed or shipped with existing quantities. They can also stop a given item or revision from being used, preventing its receipt in store locations and issues from all locations throughout the company.

Another nifty MRO-oriented feature would be component tracking by *illustrated parts list* (IPL) for aircraft and related maintenance organizations, whereby the solution quickly pulls together the unique BOM (IPL) needed for any particular job, even though on-condition repairs cannot be determined until after a technician review specifies the required labor and material, whereas users can maintain information generated about the returned item from the initial receipt of the part through quoting, repair, shipping, and invoicing. Further, the returned items information from receipt to invoicing for MRO organizations enables users to track work orders, purchase orders, sales orders, inventory, approvals such as FAA airworthiness Form 8130, and costs by both project item and condition code, whereby the module

maintains a capabilities file by item number that automatically determines if the user is allowed to perform the work that needs to be done, assuring the shop only undertakes repairs on items for which it is certified.

Last but not least, the above-mentioned *illustrated parts breakdown* (IPB) system is essentially a computerized, interactive tool used to develop an "owner's manual" to assist in the MRO of large end items such as aircraft. The system maintains all data required for the composition and production of IPB manuals and has the capability to be linked to "illustrative data" or drawings and documents, all of which can be updated in real time. The IPB "manuals" include front matter (i.e., table of Contents, list of illustrations, list of applicable service bulletins, etc.); *maintenance parts lists* (MPL) containing illustrations, part numbers, descriptions, quantities, notes, codes; and a part number and reference designation index. The IPB "illustrated parts list" assists maintenance and supply personnel in requisitioning, storing, issuing, and identifying parts, which are listed in "disassembly" sequence, such that the mechanic working on an installation or assembly should remove the lowest-level part first. The Windows-based IPB module was designed to meet the distinct format and style specifications of military aircraft, yet it can also be easily modified to produce manuals in the Air Transport Association (ATA) 200 format of commercial aircraft. It is also capable of storing and maintaining multiple publications for various aircraft models and IPB component manuals at one time.