

ERP Research Center

In ERP

The Exacting Needs of Metal Service Centers

P.J. Jakovljevic - November 30, 2005

1. Needs Definition
2. How Metal Exacting Needs Relate to General Enterprise Resource Planning Solutions
3. Other Requirements

Related Book

Needs Definition

There is one market where the vast majority of general *enterprise resource planning* (ERP) products show a number of "fatal flaws". Metal services centers, which perform operations like cutting, slitting, painting, galvanizing, anodizing, etc., and their related converting operations, which may involve paper, textiles, plastics, etc., suffer from an absence of "must have" capabilities. Such omissions impede an enterprise's operation—often resulting in complete failure. See [Find the Software's Fatal Flaws to Avoid Failure](#) for more information.

This article will highlight the requirements and fatal flaws that these prospective enterprise applications users face.

With limited knowledge of cutting and surface treatment operations, those who are not familiar with the metal centers' *modus operandi*, might quickly conclude that the industry's requirements are rather basic. However, the unique nature of metal products means that inventory information is critical, and only those experienced with the operations of metal service centers understand that their unique business requirements demand distinct software that can concurrently handle and track several inventory item attributes or specifications, such as heat, dimension (width, length, gauge), form, diameter, shape, grade, grain direction/texture, density, and more. The system must also be able to record and evaluate detailed information on chemical, metallurgical, and physical properties. Tracking inventory up and down the supply chain, including lot, heat, tag, and certification is also vital.

Another absolute must is that metal processors and service centers need to be able to trace the ancestry and genealogy of an inventory tag from its *purchase order* (PO) receipt to the customer's delivery ticket. For such an enterprise, it is invaluable to be able to enter a master tag number or heat number for a coil or a bundle of sheets,

pipes, or tubes, and see every single piece produced from it, along with the processes that were performed, at what cost, and the details about who purchased the piece, when, and for how much. Information on how much profit (or loss) was generated from that order, part, or tag is also vital.

Products made at these sites include a wide variety of metal sheets, pipes, tubes, and wires that vary in terms of grade, size, and chemical composition. Moreover, up to 90 percent of customer ordering patterns can vary considerably. Thus, software used by a metal process center must allow the user enterprise to efficiently manage and control inventory, effectively plan production, perform the necessary quality control, and trace the process all the way down to the steel heat level used to meet particular national standard grades for items such as mild/carbon steel, stainless steel, aluminum alloys, etc.

These companies also require software that can quickly configure quotes and orders based upon exacting customer specifications. Paramount to proper inventory management is that the system must also be able to recognize that an enterprise's inventory is multidimensional and multifaceted. When a user company offers products in different dimensions such as length, width, thickness, diameter, etc., the software's formula engine should be able to ensure the validity of the configured items, and deliver convenient cost-plus pricing capabilities that allow users to associate profit margins with materials and labor, or the overhead costs for configured items.

Further, each customer usually wants to be invoiced in their preferred *unit of measure* (UOM) such as pieces, pounds, hundred weight, lot, kilo, etc. Consequently, the software should be able to convert these based on the material's characteristics including specific weight or density.

Additionally, customers will often have specific labeling and packaging requirements and materials handling needs. Often, they will require detailed certification or material, or *mill test reports* (MTR), and if the selected software solution cannot handle these type of inventory and document management requirements seamlessly, the hidden administrative costs will quickly erode the enterprise's profit margin.

Another feature that metal service centers require is the ability to identify the ideal raw materials needed to fulfill any given customer order. To that end, a so-called parsed item lookup feature must permit effective item searches down to the cut piece level, efficiently display attributes to users, and define characteristics such as gauge, width, length, heat number, schedule, thickness, *internal diameter* (ID) and *outer diameter* (OD). It should also have advanced sorting and filtering capabilities, and be able to identify an exact piece of inventory within seconds.

When the stock on hand cannot satisfy the requirements of an order, users must then be able to quickly view what material is on order and see when it will arrive, and what its specifications and attributes are. In case the enterprise does not stock the item the

customer is requesting, or it has never purchased the item before, the resulting buyout must be handled quickly without disrupting the normal order flow. These buyouts might have to be drop-shipped directly from the supplier to the end customer or to a sub-contractor if outside the value-added services being performed.

How Metal Exacting Needs Relate to General Enterprise Resource Planning Solutions

Some may argue that general *enterprise resource planning* (ERP) solutions offer a method of determining inventory availability; however, only a selected few allow user-definable attributes to be associated and validated for each item and each piece of stock within that item's inventory, and can do so without encumbering the master item classification.

The product line of some customers might consist of a few thousand products that fall in two categories: 1) standard, and 2) non-standard, sub-assemblies (products). For example, the standard material may be an aluminum coil ranging from 42 to 60 inches in width, weighing between 2,000 and 10,000 pounds. When shipped to a customer as a finished good, the coil has to be slit, cleaned, etched, anodized, dyed, and sealed. While standard products are manufactured and placed into the inventory to meet forecasted sales demands and long term customer contracts, non-standard sub-assemblies are more numerous and are fabricated only when the customer's order is received. Such orders are not typically placed in inventory, and are instead shipped directly to the customer when the fabrication process is complete.

Each product, whether standard or not, has to be sized, packaged, and coated to customer specifications at the ship-to or line-item level. These specifications can change from one order to the next, and are communicated to the production floor, so the appropriate action and documentation can take place. Many times, the completion of specific activities must be certified to the customer. The supplier (metal center) has to accommodate customer specifications without requiring a new *bill of material* (BOM) or routing for each new customer configuration. Consequently, having historical cost and pricing data available for instant retrieval during the quoting and order entry process is critical to servicing customers over the telephone. Often, a faster data capturing green-screen *user interface* (UI) is preferable to a "snazzy", time consuming, and memory intensive rich *graphical user interfaces* (GUI).

As a matter of fact, BOMs are often not required for customized customer orders because the starting item and the finished item are the same item in the customer's mind. As a result, the software system used by a metal service center must be able to follow this logic. It must be flexible and accommodate how a user assigns numbers to items, such as a mild steel grade, a mild steel grade standard size sheet, or a mild steel grade standard size sheet that is an inch thick. Furthermore, end item variants must be handled under the same item number, but with a multiplicity of variations listed as attributes.

Customarily, a generic ERP system cannot make such accommodations. It requires each order (or even worse, each order line item) to be treated as a new product or item number, creating redundant work, and item nomenclature glut and delays, to the dismay of customers and an enterprise's employees. As a result, the enterprise's sales force or shipping personnel has to plow through a number of illogical item numbers, where several redundant item numbers referring to the same physical product are likely to appear.

Therefore, astute metal center software must also be able to optimize cutting operations and minimizes waste. A so-called material selection optimizer feature should come in handy to pre-filter inventory whose dimensions, and chemical or physical properties do not match the order specifications. The current order can then be nested with other open orders, even if they are for different customers. The product can then be produced from the same inventory result set. Doing this allows an optimal cutting layout to be determined and minimizes remnants. Additionally, the system should be able to optimize the usefulness of the remnant inventory by determining if the scrap and waste can be further used. This must also be done in terms of multiple UOMs, heat/lot/serial tracking, and MTRs. The sales staff must be able to see when and what size of remnant will be created, and this needs to be done under the same item number (but with different size attributes).

Traditional *manufacturing resource planning* (MRP) systems only look at the quantity on hand, the demand quantity, and order quantity, and are able to advise users whether there is enough tonnage to meet customer demand. But, these systems cannot discern whether the available total tonnage on stock meets the customer's dimensional specifications.

A specialized MRP module for metal centers must be able to recognize when current demand cannot be satisfied by the in-stock inventory due to dimensional issues and it must include unsatisfied demand in its reorder messages. Peculiar inventory information, and how it is used to optimize operations, is often "a showstopper" for most general ERP solution providers. For example, when a company from the metals industry approaches a mainstream, ERP provider and asks for solutions to manage down costing of drops and remnants, it is often met with a blank stare, which coverts into a less than 50 percent out-of-the-box functional fit, and a horrendous scope resulting from system customizations.

Other Requirements

Also, shop floor data collection requires a simple, single point of entry for data capture, and astute ERP products should be able to support the following metals industry capabilities:

1. Provide the exact location, heat, size, and quantity of material to pull from inventory.

2. Display the finished product, scrap, and remnants they are expected to produce.
3. Allow an employee to record actual products produced and to record the time expended to produce them.

Although these three capabilities might be generally supported many generic ERP products, to help communicate accurate delivery dates (and keep customers happy) the system must deliver up-to-minute information about available inventory, in-transit inventory, replenishment orders, manufacturing schedules, and lead times, all while taking the item's attributes into consideration. Distribution solutions for shipping and receiving, should allow users to define carriers, shipment methods, freight rates, and customer routings. Moreover, these solutions should also easily interface with common third-party shipping and manifest software (e.g., **Kewill's Clippership**). Additionally, *radio frequency* (RF) and bar code functionality should provide the following transactions to help ease data collection: inventory move within a facility, print location labels, shipping, inventory move, physical inventory, and cycle counting.

One vendor that does address the needs of metal serving centers is **Verticent**, which has also developed alliances and partnerships with complementary solution providers. Verticent also recognizes some metal centers' need for *yard management systems* (YMS) and truck route scheduling and optimization capabilities, and it is currently brainstorming whether to develop these internally or to opt for an alliance.

To recap, general ERP providers, who likely have a solid product and are viable companies, typically do not have the functionality to meet the dimensional inventory, and chemical and physical property requirements that are vital to the metal center services industry. On the other hand, several metals industry specific solutions providers, such as **Enmark Systems**, **Invera**, **Compusource Corporation**, **STEELMAN Software**, **Axis Computer Systems** and to a degree **SYSPRO**, and **SoftBrands' evolution** or **Exact Software's JobBOSS** products may certainly address some of the complexities of the industry.

User Recommendation

As a litmus test to determine if an ERP solution caters to the needs of metal centers, one should ask whether the solution can automatically compare available inventory specifications like width, length, gauge, and chemical and physical properties against a customer's order specifications and show which pieces of inventory meet the customer specifications and which do not. It is quite likely that this would be one of the first stumbling blocks for many generic ERP providers.

Related Book
