

Seiban



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Table of Contents

	Page
Introduction	1
What's Wrong with MRP?	2
The Challenge: Going Against the Design of MRP	3
The Japanese Have a Word for It	4
The GLOVIA Seiban™ Solution	5
The GLOVIA Seiban™ Workbench	7
GLOVIA G2 Seiban™	8

Introduction

Traditional MRPII logic assumes that all inventory is available to satisfy any customer requirement and does not allow for the separation or allocation of specific materials, parts, or in-process work for customer-specific use.

The ability to maintain separate customer identification within the general population of parts and orders has traditionally been used in Contract and Project manufacturing environments. However, in today's customer-oriented world, this identification approach is very useful in providing clear identification and availability of materials for specific customer demand – even in Assemble-to-Order, Made-to-Stock, or Repetitive manufacturing environments.

Separation of inventories is not uncommon in Japan where a Seiban (meaning a manufacturing number) is often assigned to customer-related inventory, work orders, and purchase orders. Fujitsu, parent of Fujitsu Glovia, Inc., has helped to develop a unique implementation of Seiban-enabled MRP called PRP that allows the separation of product or customer-specific activities from the general MRP population.

Benefits go beyond the quick and easy retrieval of job-specific supply orders. The primary benefit stems from having customer-order-line level visibility throughout the entire manufacturing process. Synchronized production scheduling, assembly, and delivery of products to customers as promised, along with customer-order-line profitability analysis are the primary benefits of Seiban. Tools, such as the Seiban workbench, give instant access to all Seiban-related information and supports impact analysis, "What-if" simulations, and convenient maintenance of Seiban assignment and management. Seiban also provides batch cost reduction through positive identification and tracking of all Seiban/job related purchases, materials, and routing activities at the detail level.

What's Wrong with MRP ?

MRP, Material Requirements Planning, is one of the core processing applications within MRPII and ERP systems. It is the MRP logic that ties together all of the activities of the manufacturing company and coordinates them towards the single goal of responding to and satisfying customer demand. Even with today's Advanced Planning Systems replacing MRP in ERP systems in a growing number of instances, some of the basic MRP context remains.

In particular, we refer to the basic mechanics of the demand & supply netting calculation. In MRP, and with most of the APS calculation engines as well, it is a given that "parts are parts" and that they should be made available to and used by the most critical production activity. In the simpler MRP environment, "most critical" simply means the earliest need. MRP netting logic identifies gross requirements (needs) and arranges them in date order. It then assumes that the earliest requirements will consume any available inventory and that new supplies will become available to satisfy subsequent needs. In general, this is not a bad way to go.

In most cases, the earliest need is the most critical and should therefore get a higher priority toward the consumption of available inventory. All else being equal, the later requirement allows more time to secure additional stocks so it is only logical to use the available inventory to satisfy the earliest needs. With Advanced Planning Systems, the logic is not so clear-cut but the net effect is much the same: the most needy requirement is identified and assigned priority for consumption of available inventory. In both cases (ordinary MRP and the new APS) any available inventory is thus distributed during the planning process and can be redistributed by subsequent planning runs any time the plan or the requirements change. In other words, inventory designated for "Job X" during the first planning run can be redirected to "Job Y" during a later re-planning process.

All inventory and supply orders are considered to be "open" resources, available to all customer requirements. These resources can also be easily re-assigned to a different requirement whenever needs change.¹

In most environments, this makes sense. Assuming that priorities are assigned fairly and equitably, this system will generate the best result; timely completion and delivery insofar as it can be accomplished within limited resources.

It may be desirable, however, or even required in some circumstances by customer-centric manufacturers, to isolate certain inventories for designated use and not to mix those resources with the general population of parts or open stock. In such circumstances, traditional MRP logic fails. The basic netting logic outlined above is an inherent characteristic of the technique and cannot be selectively disabled. There is no way, in most MRP systems, to isolate inventory to specific purposes. This forces the use of awkward and often ineffective procedural "workarounds" that add considerable effort and usually prove unsatisfactory in the final analysis.

¹ "All" inventory may be a bit of an overstatement. The Glovia system allows certain inventory to be designed as 'reject' or 'subject' and excluded from MRP availability (non-nettable). In addition, specific inventory locations can be designated as 'non-nettable.' These are unusual and useful capabilities, not found in many other ERP systems, but not really germane to the topic at hand.

The Challenge: Going Against the Design of MRP

Because this concept is so ingrained in the basic design of MRP, it is difficult to imagine how an MRP software developer could incorporate separation of Supply (i.e. inventories, production orders, purchase orders, and so on) into an existing software package. MRP is designed to “net in date sequence” and any change to that dictum would involve a complete rewriting of the logic.

Similarly, to incorporate selective netting capability would require a rethinking of much of the process. Selective netting is something that has been considered, sometimes attempted, and seldom executed within the MRP community.

Discarding the discussion of “open” inventory for a moment, why would a company want or need to specifically pre-designate how and where inventory will be used? One simple answer is that the customer might require it. This happens quite often today as manufactures “build-to order” in being more responsive and competitive. Customers often agree to contracts with suppliers that require the customer to prepay for materials and inventory in support of their needs. If the customer has paid for the inventory, it is his right to demand that it be used only for his own products and jobs. This eliminates the possibility that the supply orders could be consumed by an unanticipated demand on another job, leaving the real owner with a shortage and a late delivery of his own product.

In addition, there are other key benefits available if separation of supply orders is accomplished. First on the list is enhanced visibility. If all stocks and activities are tied together through a common designator, retrieval of Seiban/job-specific information is instantaneous and infallible. The ability to collect true ‘actual’ costs is greatly refined. Coordination and synchronization of all activities related to a Seiban/Job is greatly enhanced. More discussion of benefits is included at the end of this document.

“Supply Orders” in this discussion includes purchased items on order but not yet received, production work-in-process, sub-assemblies and assemblies temporarily stocked in anticipation of future use, and even planned purchase and production activities. If you want to separate the “Supply Orders” for a specific customer or job, why not separate all of the inventory; stock, on-order, in-process, and planned? Only in this way can you insure that “allocated” material and resources are truly secured for their intended use. But how would one go about making this separation and tracking the intended use of all supply orders?

The Japanese Have a Word For It

The foregoing discussion outlines a need that has been widely recognized by world-class Japanese manufactures who, typically, do not utilize MRP to identify material, parts, and activities to their ultimate use. In the spirit of keeping things simple, the simple solution is to attach an identifying number to all parts, materials, purchase orders, and manufacturing orders (all supply orders) that identify them as belonging to a particular customer, job, project, or product line. In Japan, this identifying number is called Seiban from the Japanese word Sei meaning “manufacturing” (or production) and Ban meaning “number”- a manufacturing number.

Seiban is not limited to a single instance of a product (a single customer order or contract), although that might indeed be the case. For an electronics manufacturer, for example, there may be parts that are common between the radio, television, and stereo product lines but there might also be a need to segregate TV production activities, parts, and costs from the rest. With a Seiban planning and tracking capability it is possible to easily identify those plans and activities that are for televisions and separate them from those that are for other usages of those same parts.

The Seiban is attached to purchase orders, parts in inventory, and manufacturing orders providing a convenient reference that allows quick and easy access to all information about that family of parts and activities. Our electronics manufacturer, for example, might designate a range of Seiban numbers to be reserved for the TV product line and have the system automatically assign the next available number within the sequence to a new production order for TVs. All lower level purchase orders and manufacturing orders in support of that TV production, and all resulting inventories, will carry the same Seiban.

Applying the same process to MRP is a bit more complicated. When the MRP plan is generated, all requirements and planned orders must also carry the Seiban identification tying them to the top level requirement. Further, this identification is durable (hard-pegged); the planned activities thus Seiban-stamped cannot be considered available to satisfy any other requirement.

The result is like having separate MRPs within the overall MRP process. In actual practice, there are, indeed, separate MRPs for each designated Seiban requirement performed right along with the “regular” MRP for non-Seiban requirements. GLOVIA G2 simplifies and enables this process to take place through its interactive Seiban Workbench and PRP application.

The GLOVIA Seiban™ Solution

The GLOVIA G2 ERP system incorporates the Seiban principle within a larger resource planning application that can coexist, and is fully integrated with, traditional MPS and MRP approaches.

This tool, called PRP, is designed to track jobs, projects and contracts, gathering all related costs into a defined contract and making status, progress, and projected customer delivery information readily available.

The GLOVIA G2 Seiban tool utilizes its unique identification system to link together all aspects of a customer's order, job, project or contract and simplify retrieval and analysis chores through multi-level pegging of a customer's demand with all of its associated supply sources. PRP will then plan and re-plan material items and "service items" for all forms of customer demand-be it a sales order, contract, or project. Service items, such as consulting, education, and installation, are used to sell services and track activities associated with those services.²

² Service items, unlike material items, are delivered rather than shipped. They are not manufactured. A service item contains a Routing and may contain a Bill of Materials (BOM) of associated material items. The routing for a service item describes the steps necessary to deliver a service. The BOM for a service item contains the sundry material items that are required to deliver that service.

Since planning of all items associated with a customer’s demand is fully integrated, full identification of their supply sources is assured. As a result, it is easy to assess the impact of changes at any level of the overall effort and manage those changes throughout the process.

Successful Lean companies encourage employee involvement, quickly respond to and take action on identified needs, particularly those of value-added production workers. It’s all about fixing problems. It’s called Kaizen and it’s very important.

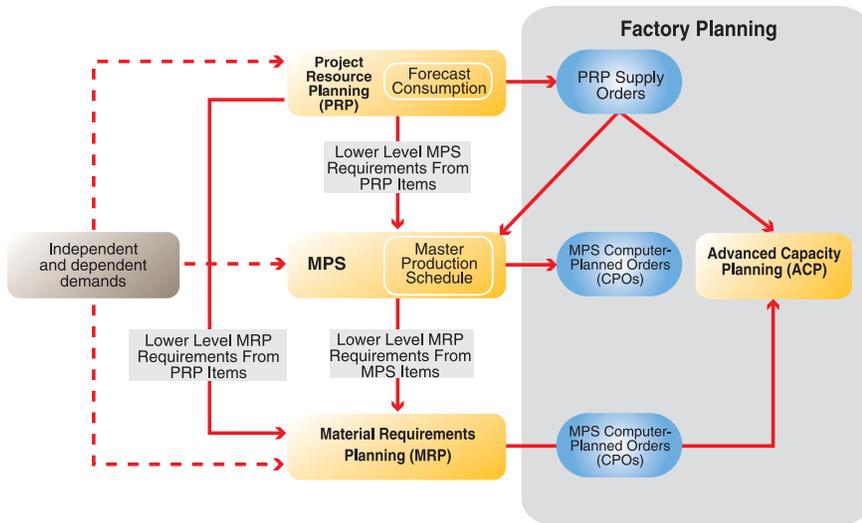


Figure 1; How PRP interacts with the other planning applications

Seiban enabled PRP, along with Master Production Scheduling (MPS) and MRP, plans demand in a dynamic manner. PRP sends requirements to both MPS and MRP as appropriate to the items. MPS, in turn, sends requirements to MRP for dependent items within demands passed by PRP. PRP performs forecast consumption for PRP items. MPS performs forecast consumption for MPS items. Rough-Cut Capacity Planning (RCCP), and Advanced Planning (APS) apply to supply orders from PRP as well as to MPS and MRP.

PRP, triggered at the item level, enables multi-level pegging (both hard & soft pegging) to the customer’s order, contract or project, thus allowing the user to instantly know the status of each item or service associated with fulfilling that customer’s demand. Although these features are helpful in fulfilling a customer’s order, the overall goal is to fulfill your customer’s order profitably. With GLOVIA G2 Seiban you can deploy target costing – a direct identification of actual production and procurement costs—which allows you to measure the profitability of a customer specific demand.

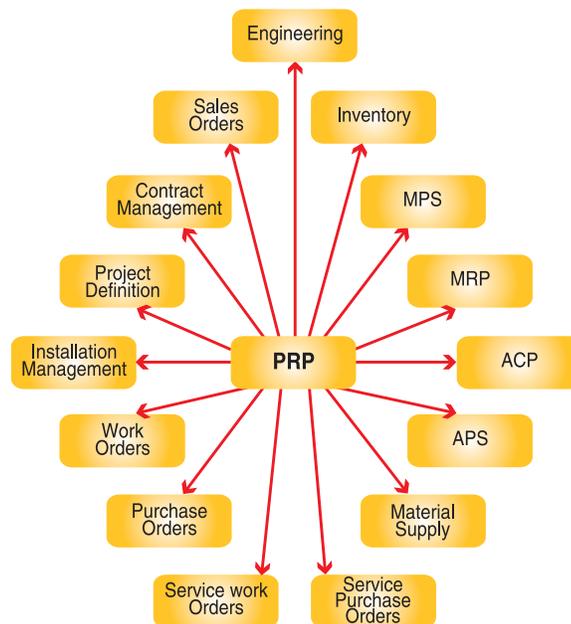


Figure 2; PRP is fully integrated with the rest of the Glovia system

The GLOVIA Seiban™ Workbench

GLOVIA G2 Seiban functionality attaches a manufacturing number to all activities and supply orders associated with a Seiban-designated item. When a requirement is entered for a Seiban item, the user may enter a Seiban number or may allow the system to automatically assign the number from a designated range of Seiban numbers for that item. The user-assigned Seiban could be the customer ID, customer order or order-line number, customer PO number, project or contract number, or any other odometer driven or user defined number.

When a supply order is generated, either manually or through GLOVIA G2's planning systems, the supply order inherits the Seiban, which acts as a second key (field) for the order. Similarly, purchased parts and assemblies/operations performed by 3rd parties also inherit the Seiban upon release, as do inventory commitments and planned supply orders.

The GLOVIA G2 Seiban Workbench facilitates all management and maintenance of Seiban related parts, orders, and activities. It provides a set of tools to:

- establish initial dates based on order, contract, or project dates
- generate projected supply orders
- reconcile dates
- plan and replan

- process the exception messages generated (during planning and replanning) for specific demand requirements and supply orders.
- perform impact analysis
- link to GLOVIA G2's Buyer Workbench
- link to GLOVIA G2's Item Inventory On-hand Inquiry
- link to GLOVIA G2's MRP/MPS Planning Inquiry

Since all orders and activities are tied together through the Seiban number, retrieval of all Seiban-related information is fast, complete, and easy. Furthermore, the effect of a change or potential change to any Seiban activity can be quickly determined and "what if?" scenarios can be tested easily within the customer order, contract, project or batch that the Seiban unites.

Remember that Seiban can be applied to any kind of product or order. It is useful beyond the contract environment to trace activities and costs for any product line, batch of products, production "run," or any other individual item or grouping.

GLOVIA G2 Seiban Benefits

The GLOVIA G2 Seiban functionality provides many other benefits beyond quick retrieval of related information:

- The ability to plan and replan material items and service items and to manage these items through the use of Seiban identification numbers.
- The ability to perform impact analysis to see the effect of a change or potential change – because all other activities (both up and down the bill-of-material chain) are tightly linked to all others.
- The ability to change the schedule for any item within the Seiban and all other item schedules can (optionally) be adjusted by the same amount at the same time, keeping them in synchronization. This also applies to changes in the customer requirement or Master Schedule.
- Full integration with the Master Production Schedule (MPS) and Material Requirements Planning (MRP), meaning that Seiban planning and management work independently of but in full coordination with the planning and management of non-Seiban items.
- The ability to track all costs associated with the Seiban and value-added activities including direct-purchased materials, work orders, services, and indirect costs.
- Improved inventory management through the ability to peg replenishments to requirements.
- Reduced inventory requirements because acquisition and replenishment can be tied directly to specific needs.

- The ability to perform multi-level planning. For material and service items, PRP explodes the associated BOM and plans the PRP items. Lower level MPS and MRP items are sent to the appropriate application (Master Production Schedule or Materials Resource Planning) for planning.
- The ability to perform detail resource planning for an order.

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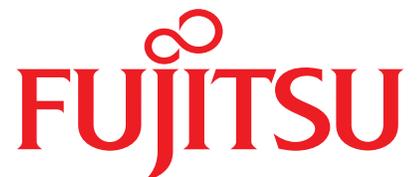
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The Fujitsu logo is displayed in a bold, red, serif font. The letter 'i' is stylized with a small circle above it, resembling an infinity symbol or a traditional 'i' with a dot.