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## **Understanding the Concepts of MRPII/ERP**

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Globalizations have left many manufacturing and service-oriented companies with the option of pursuing worlds best practices or perish. Many companies now realize the need for the development of world class systems and methodologies, as well as acquiring the "productivity tool" that will let them be in a commercial position to offer competitive manufacturing resource planning that assures customers of quality goods and services and compliance with international quality requirements on different industry fields.

In the competitive business environment of the twenty first century many companies have decided to use a popular tool that has evolved over the past few decades. ERP, the descendant of MRPII offers the "answer" to the economic and productivity troubles of manufacturing and service enterprises. The ERP system has recently become very popular as an enterprise management software tool, and there are many useful products in the software market to fulfill this need today.

The purpose of this series of articles is to contribute a review and analysis of the following questions:

What is MRPII/ERP software solutions position on this environment?

Do we completely understand what this system is designed to do?

Is it really what we are looking for?

Is our company prepared to start using it?

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During my experience as consultant, I have noticed that information speed and the need for quick response times does not allow time to analyze the real concept of this methodology and their close relationship with old and new methodologies such as Quality programs, Administration and the more recent concepts of: Hoshin Kanri, JIT, Kanban, Lean Manufacturing, QS, ISO, etc. as well as the technology advances. As a consequence, acquired MRPII/ERP solutions are many times misunderstood and underutilized, with the respective cost consequence.

In order to relate MRPII / ERP methodology and software logic with current business practices it is important to review three important concepts in productivity terms:

The basic Administration Cycle: Planning, Organization, Performance and Control.

Hoshin Kanri – The newest strategy policy management came from Japan, which assures high productivity levels.

Interaction of above points with ERP methodology.

## Administration Cycle

To administer any form of enterprise, four steps (Planning, Organization, Performance, and Control) are needed at their own levels: top management, medium management and operative areas. Manufacturing companies and MRPII environments are not the exception.

On this point, it is important to mention that successful administration systems and productivity do not depend only on operative levels (high production rates, 100% machine utilization) but on the team job and balance and negotiation between all parts objectives and policies (that should match 100%), starting with:

A professional Business Plan: Mission, Vision, Objectives; What we want to sell, how is the market we will be moving on?, where we will establish the facility?

A realistic and deep Sales Plan: What our forecasting techniques and horizons will be? Rough numbers are needed under a deep analysis.

Rough Production Plan: Based on Sales Plan, what is the capacity we require and the quantities I can produce?

Master Scheduling: How we will optimize cost covering sales requirement and leveraging production and capacity levels? Inventory policies.

TPM: When do we need to implement TPM and what will be the strategy?

Purchasing: Which long term agreements are needed in order to optimize cost and collaborate with inventory levels?

Shop Control: How will I need to track and my production performance?

Vital Fees: How will I know that my company is “healthy” and productive? How will I implement corrective and preventive actions?

## Hoshin Kanri

Many companies that have recently received either the Deming or the Japan Quality Awards are those that have implemented this strategy. The base of this new administrative tool is to use the business philosophy and vision to formulate and develop a business strategy as a part of their medium and long range planning, as well as develop and implement targets and measures based on annual timeframes.

A basic overview of the elements of this methodology is:

Vital Fees: How will I know that my company is “healthy” and productive? How will I implement corrective and preventive actions?

Establishment of a Vision

Establishment of Operating Goals and Targets

Strategic Gap Analysis / Strategic Assessment

## Comprehensive Evaluation of Strategic Analysis Results

Establishment of medium and long term strategic concept basic goals/Basic Strategy

Establishment and Implementations of Annual Goals and Measures

"Check and act"of implementation results

As a complement, this methodology uses a successful theory: Dairy Job Administration: process standardization, clarification, analysis, re-standardization, results assurance and evaluation.

All Quality awards and certification programs are linked to this methodology and meet with all their points.

### Interaction of Above Points with ERP Methodology

The two above points are closely related with ERP philosophy and methodology. ERP solutions are focused on optimizing productivity by focusing on planning and executive reporting of the Enterprise as an integrated unit.

First, it is important to mention the difference between three concepts that could be misunderstood: MRP, MRPII and ERP. MRP\* by itself is the original modality (during the 60's) of what we know now as ERP, and only covered materials planning; nowadays, this is only a part of our ERP systems.

MRPII is one of the evolution stages of current ERP's and covers all the resources in a manufacturing company, with the additional ability to manage "what if"(hypothetical) situations. The interacting functions considered for this model are: Commercial Planning, Sales, Master Production Scheduling, Materials Resource Planning (MRP\*) and support systems for Capacity and Materials Execution.

ERP systems are the latest stage of this evolution and considers the following points (can be considered but not limited to the following):

<b>Operation</b>	<b>Commercial</b>
Rough and Finite Capacity Requirements System of Engineering Changes Product Data Management Work Orders Flow Manufacturing Support Systems Manufacturing Simulation Systems	Commercial Planning Marketing Systems Sales Forecasting
<b>Financial</b>	<b>Materials</b>
ABC Financial Planning Accounts Receivables Accounts Payable	Item Master Inventory Management Master Scheduling Materials Resource Planning MRP
<b>Distribution</b>	<i>* It is important to mention that Human Resources involved subjects are covered in ERP's.</i>
Distribution Systems	

On the other hand, ERP models work based on the following levels of control for the enterprise administration:

**Executive Planning** - Business Planning, Sales Planning, Production Planning (Rough capacity).

**Medium Management Planning** - Master Scheduling and Inventory Control, Materials Planning (based on products structures) and Capacity Planning (Routing).

**Operative Execution** - Procurement, Shop Floor Control (Costs) and Performance Evaluation.

**Three above points are always interrelated, with information flow in continuous improvement cycle.**

As in any integrated System or Unit, the performance of each one of the parts of an Enterprise has an impact in his cumulative performance results. Specifically, we can say that a 95% performance in independent vital enterprise elements (Item master, Bills of Materials, Production Master Schedule Adherence, Inventories Accuracy, Production Orders Accuracy and Purchase Orders Accuracy), will reflect a 75% cumulative performance in an ERP environment. This means there is a percentage of failures possible in productivity terms.

Here is where we should support and combine this useful tool with a business strategy based on the desired administration tendency or theory.

In this sense, it is vital to note the point on administration before deciding which ERP software is the one we will be using, we need to have solid administration principles (no matter which administration tendencies you decide to choose) and strong knowledge of ERP methodology.

This will translate into synergy between areas that will allow organizations to have highly effective processes with a continuous success. Only by creating a deep understanding of this philosophy will we have the certainty of obtaining the best results, a well as being in position to face and take proactive actions for any obstacle we encounter. If we do not have this reference point (no matter how quickly or expensive our system is, or even if we duplicate the speed), our efforts will deliver the wrong results.

In conclusion, prior to buying or beginning to utilize our ERP solution, we need to respond to the questions at the commencement of the article. How we have the elements, answers and actions depends on the level of dedication that an organization has to improving itself.

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