

# P2B (PLANT-TO-BUSINESS) SOLUTIONS FOR A COMPETITIVE EDGE

**KABE Makoto** <sup>\*1</sup>

---

*The “P2B (Plant-to-Business) solution” proposed by Yokogawa Information Systems Corporation is an IT solution that facilitates prompt decision making by integrating plant information with management information. The P2B solution is achieved by automatically collecting real-time plant operation data generated on the manufacturing premises, while simultaneously implementing systematization according to factory management with the visualization of plant information, and subsequently interconnecting it with the business management system. Consequently, users from field staff to managers and management executives can utilize the unified information with high reliability in a timely manner, and establish the PDCA (Plan-Do-Check-Action) cycle. This facilitates the accomplishment of the specific aspirations of parts of the enterprise and of management goals as a whole, thereby realizing more efficient, consistent management. Based on this concept, Yokogawa Information Systems Corporation provides a variety of excellent support for improving customer value and Total Cost of Ownership (TCO) based on proven-in-use open package systems, including those for business systems such as Enterprise Resource Planning (ERP), Enterprise Performance Management (EPM), Supply-Chain Management (SCM) and Customer Relations Management (CRM) for plant systems, and system packages such as Quality Information Management (LIMS) and Plant Operation Information Management (PIMS).*

---

## INTRODUCTION

Today, process industry companies are facing more and more heavy global competition and market diversification along with increasing economic globalization, acceleration toward the establishment of the Asian Economic Block and maturation of the domestic consumer market. To survive in these economic circumstances, many domestic companies have been reinforcing their business bases by abandoning or merging production facilities and business units to renew their operating bases, developing advanced high performance products based on R&D strategies, reducing product costs, improving productivity and cutting down distribution costs and various expenditures.

In addition, production divisions in factories or on

manufacturing floors have positively constructed advanced information systems and made keen efforts to improve production efficiency to cope with a rapid shift from a high-quality mass production system to a short-cycle various kinds and small quantity production system. These days, however, it is extremely difficult to make timely and proper decisions based only on the monthly macro information gathered from various departments of the head office or factories because of changes in the business environment.

In an economic environment involving more drastic changes in the future, it is essential to monitor the working or operation data on shop floors as reliable information helpful for management requiring proper and timely decision making. To achieve this, it is mandatory not only to visualize information concerning the flow of goods and money in overall corporate activities so that each management at various levels can quickly use the visualized information but also to rebuild or advance an IT

---

<sup>\*1</sup> Yokogawa Information Systems Corporation



**Figure 1** P2B (Plant-to-Business) Solution's Concept

infrastructure for adequate management cycle support.

Considering this background, Yokogawa Information Systems Corporation has proposed a P2B (Plant-to-Business) solution for integrating the plant operation data and management information seamlessly. Figure 1 shows the P2B solution concept.

## APPROACH TO REALIZING THE P2B SOLUTION

A key to gaining the competitive edge lies in using IT technologies effectively for management. In particular, corporate optimization through integration of factory administration and business administration, which is the aim of the P2B solution proposed by Yokogawa Information Systems, is essential in the process industry.

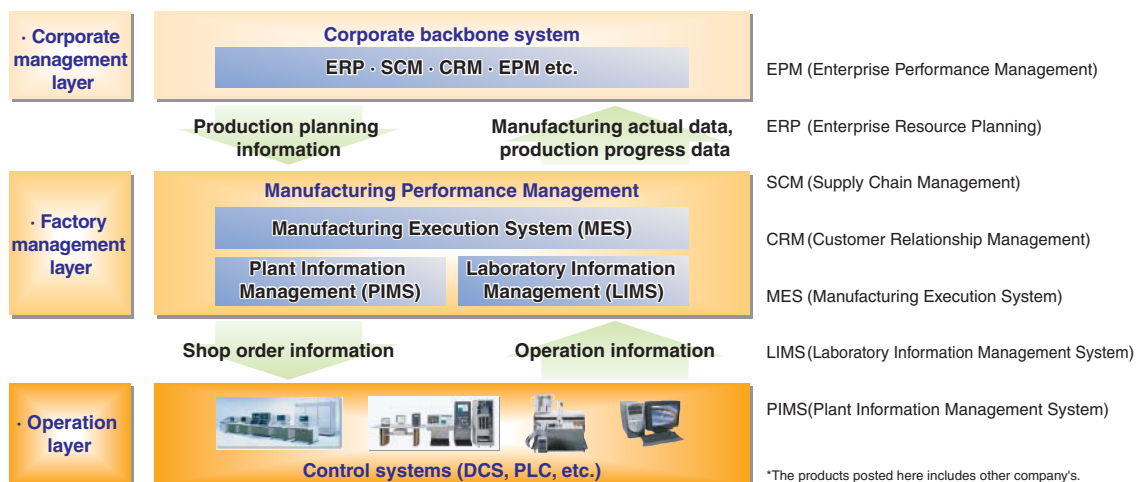
One of the tasks for realizing the P2B solution concept, which integrates all the systems of the factories and the head office for management, is to bridge the plant operation data and management information. This means that the lead time for summation of manufacturing actual data is minimized and time for manual data entry and reentry are all eliminated to obtain final values that are consistent at the corporate level, and furthermore

data obtained in different management cycles are adjusted and systemized, resulting in seamless cooperation with enterprise backbone systems. The next task is to create a scheme for managing corporate performance to ensure that segment analysis on profitability and the results of monitoring various management indexes are both visualized to properly and speedily maximize the corporate performance. In this case, it becomes essential to create a flexible management scheme capable of performing optimization at corporate levels rather than factory levels so as to promote effective, speedy factory management and cost reduction by improving the accuracy of plans and the factory

equipment utilization rate and shortening the cycle for collecting data on achievements.

Figure 2 shows a hierarchical model for realizing the P2B solution proposed by Yokogawa Information Systems Corporation.

- (1) The operation layer combines control systems such as Distributed Control System (DCS) and Programmable Logic Controller (PLC) and the Manufacturing Execution System (MES) to ensure that order information such as manufacture order, manufacture conditions, recipe, parameters, lot information and standard operation procedure (SOP) is received and manufacture information such as operation data indicating the manufactured product items and product quality data is sent to the factory management layer.
- (2) The factory operation management layer receives production planning information from the corporate management layer and sends it to the operation layer as a manufacture order. In addition, it arranges and systemizes field data incoming from the operation layer and sends it to the corporate management layer. Though conventional management in factories has been said to be an information gap domain so far, various kinds of MES packages covering various fields have been



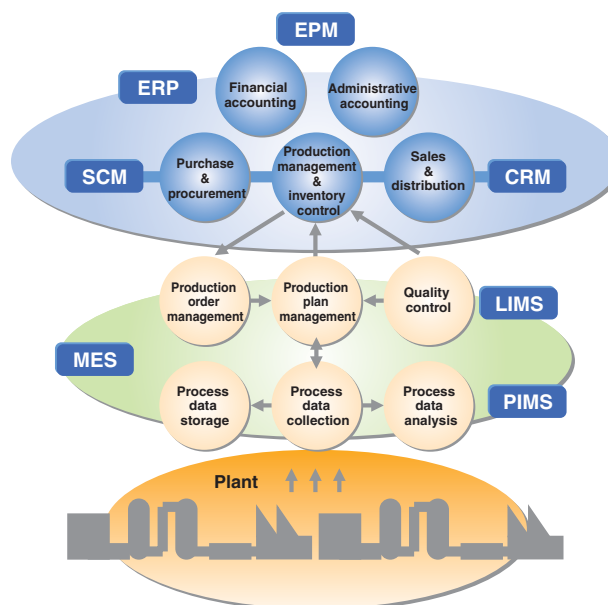
**Figure 2** P2B Solution's Hierarchical Model

#### • Business solution packages

EPM	iRenaissance - EPM
ERP	iRenaissance - ERP
CRM	iRenaissance - CRM
SCM	iRenaissance - SCM
	Aspen SCM

#### • Plant solution packages

MES	PIM-Aid: Manufacturing Execution System
LIMS	Lab-Aid: Laboratory Information Management System
PIMS	PI System: Plant Information Management System



**Figure 3** P2B Solution Packages

developed based on the experience and know-how of the Yokogawa group to ensure that the plant and business layers seamlessly cooperate with each other.

- (3) The corporate management layer integrates the systematized plant operation data from the factory management layer and management information by using various packages of iRenaissance, which is the ERP solution from Yokogawa Information Systems Corporation. In this way, management integration takes place, so that plant operation information can be visualized and quick decision making for management can be made, resulting in drastic contributions to management issues such as efficiency improvement, cost reduction and customer service improvement in overall business activities.

### SOFTWARE PACKAGES COMPONENT OF P2B SOLUTIONS

P2B solution software packages are outlined below (Figure 3). These packages are all field-proven open source packages whose functions are continually improved and enhanced and new products are also developed based on them.

#### iRenaissance (Full suit Package) for Process Industry

“iRenaissance” is an ERP solution from Yokogawa Information Systems Corporation as an exclusive representation and it consists of the following four solutions.

- iRenaissance – ERP (Enterprise resource planning package)
- iRenaissance – CRM (Customer relationship management package)
- iRenaissance – SCM (Supply chain management package)
- iRenaissance – EPM (Enterprise performance management package)

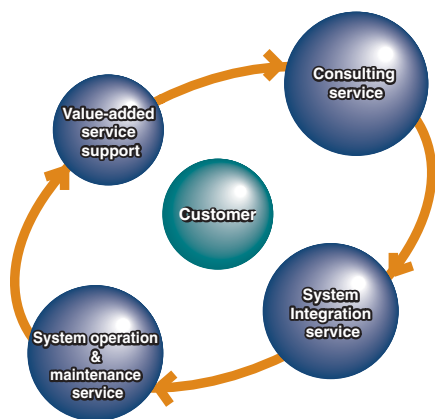
iRenaissance is a backbone operation package primarily designed for accounting, sales, procurement, production and inventory in process industry companies for petroleum chemistry, chemical, pharmaceutical, consumer package goods, foods & beverage, pulp & paper and metals. This package system is based on Internet technology and has the advantages of system expandability and quick response to changes through Web browser access. As of March 2006, iRenaissance has already been installed 1300 companies in foreign countries and 100 companies in Japan. This software package has been developed by CDC Software group (China).

#### SCM Solutions (supply chain management System)

SCM Solutions are a supply chain planning solution which has already been installed by 55 companies in Japan. This package enables the entire supply chain to be optimized through the use of demand management, production assignment/baseline production planning, scheduling and delivery response functions.

#### PI System (Plant Information Management System)

This PI system collects process data in real-time via process control systems such as DCS and PLC, stores it as historical data for a long period of time and monitors the status, quality and production performance of each process through the use of analysis functions. At the same time, it provides systemized process data for the upper corporate management layer. This package is a typical PIMS (Plant Information Management System) package primarily designed for use by the factory management layer, which has been said to be an information gap domain and more than 11,000 systems have already been installed around the world. This package has been developed by OSIsoft (USA).



**Figure 4** P2B Solutions Support Service

### **PIM-Aid (Manufacturing Execution System)**

This PIM-Aid package comprises three functional areas: PIM-Aid: PL provides for production planning and PIM-Aid: AR for manufacturing performance management PIM-Aid: BM for Inventory optimizations. Because production plans are created by the corporate management information system at corporate levels, they need be modified as concrete plans that meet the real operating conditions of each factory. The package PIM-Aid: PL has been designed to support this modification. The package PIM-Aid: AR receives quantitative data from the above PI system, including the quantity of production and amount of materials to be used and then generates factory management information such as cost management, production cost unit management and production efficiency based on the received information. This package seamlessly cooperates with the PIM-Aid corporate management system to ensure laborsaving and efficiency improvement at corporate levels. This package has been developed by Yokogawa Information Systems Corporation.

### **Lab-Aid (Laboratory Information. Management System)**

This Lab-Aid package has been designed not only to improve the efficiency of test operations in quality control, quality assurance, and RD departments of manufacturers but also to support the operations at the entrusted analysis centers. This package has various laboratory automation functions for automatic data collection from analysis instruments and paperless data processing and helps the user comply with ISO9000, FDA21CFR Part 11 and GMP. This package has been developed by Yokogawa Information Systems Corporation.

### **CONSULTING SERVICE FOR P2B SYSTEM INTEGRATION**

When a P2B system is established by optimizing the each business and plant packages, its success depends on the management targets to be shared at corporate levels and the concept of the P2B system itself. To cope with this, it is very important that both the package consultants from Yokogawa

Information Systems Corporation and the management and field administrators of package customers should launch a system installation project and promote system development focusing on business process reengineering (BPR) and management target achievement under the leadership of the top management.

Below is given a summary of comprehensive consultation services based on rich experience and know-how of Yokogawa Information Systems Corporation, including system developments, system operations & maintenance and value-added service support (Figure 4).

#### **(1) Consulting service**

Based on experience of business consultation for over about 300 process industry companies, Yokogawa Information Systems Corporation not only install the packages but also proposes the best of breed systems including system customizations and developments, thinking about operation improvement with customers from a viewpoint of overall optimization through coordination of interdepartmental operations.

#### **(2) System Integration service**

Professional system engineers having experience in both business practices in the manufacturing industry and application packages build a cost-effective, high-performance system, aiming at the integration of management and Information Technologies.

#### **(3) System operation & maintenance service**

Yokogawa Information Systems Corporation not only enables the customer to maintain the value of a constructed system with its system operation & maintenance service but also provides an outsourcing service for the entire system as necessary.

#### **(4) Value-added service support**

To provide excellent support in TCO (Total Cost Ownership) over a long period of time, Yokogawa Information Systems Corporation not only improves the customer system but also proposes the next-generation system based on its experience and know-how acquired through system operation and analysis. It also provides functional enhancement services for sales/procurement on EC (Electronic Commerce), web-based settlement and EAI (Enterprise Application Integration) solution for coordination of internal and external systems.

### **CONCLUSION**

In the process industry, the Yokogawa group has acquired rich application creation know-how through experience with many software packages ranging from plant to business and system engineering services. Based on these achievements, Yokogawa Information Systems Corporation continues to strongly support business process reengineering in conjunction with customers as the only P2B integrator in this industry. ◆

\* 'iRenaissance' is developed by ROSS SYSTEMS(USA) of CDC Software Group Company. Other product names and brands used in this paper are trademarks or registered trademarks of their respective holders.