



®

First-generation IntelliPlant® ERP Solution

Purpose of this document

The purpose of this document is to describe a Client's Business case and the integration scenarios that solved the business case.

Background

For several years, our client has been a leader in the process industry with respect to leading technology and gains in productivity with technology. Few companies come close to this Client's technological advancements.

The Business Case

If the company's information systems were integrated, the corporation should be able to save several million dollars per plant per year through cost reduction and gains in efficiency and productivity.

The Goal

To integrate the plant with the corporate Enterprise Resource Planning (ERP) system such that: inventory could be reduced, production would be increased, logistical costs would be significantly reduced, and customers would be better satisfied because order fulfillment would be streamlined.

In 1994, the Client began the journey to integrate their plants such that corporate could have access to facility information faster and more efficiently. They began their journey with a third party product, which took several months, but they were successful at getting data movement. However, soon after maintenance became an issue. Personnel found the system difficult to diagnose; when problems occurred they were required to go to every integration point to find the actual problem. Why the problems? The chosen product is essentially a point-to-point integration solution and creates a web of connections and dependencies that prevented the integration to be malleable enough for their plant/field environment. They became frustrated and knew there must be a better way to integrate these applications.

In their search for that 'better' solution, they revisited Computerized Processes Unlimited, Incorporated (**CPU®**). CPU® had been using messaging technologies to do integration for a while. The Client engaged CPU® to develop a pilot project, which would eventually turn into a corporate-wide architecture. The end goal for the Client, was again, to deploy a solution which would cover the enterprise and achieve their Return on Investment (ROI) as rapidly as possible.

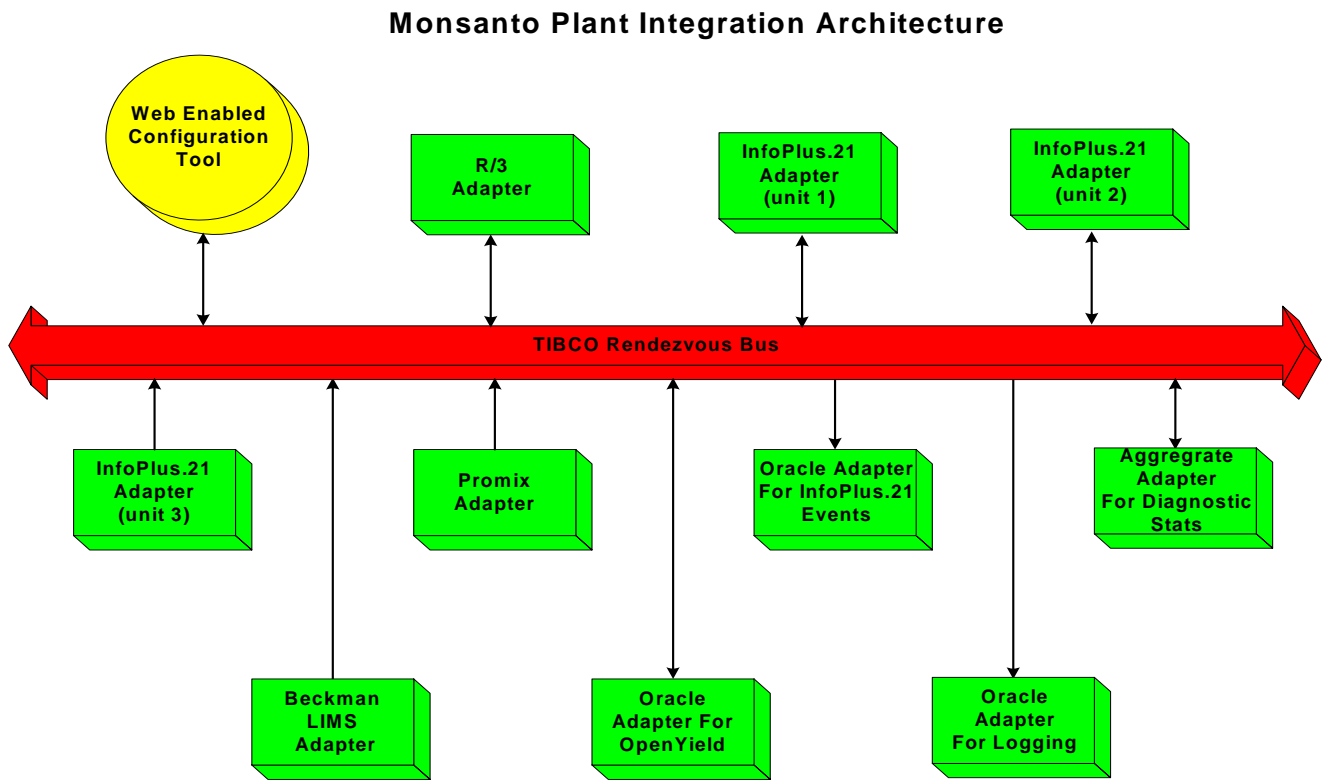
ROI Goal

The ROI goal of this project was to engage in a project for the company's Agricultural Division that would begin the rollout and realization of the company's ROI initiative at three plants in the United States, one in Europe, and one in South America.

The initial phase was to deploy integrated solutions for the US facilities. The initial phase had two parts. The first part was the 'horizontal' integration which was to replace their 'home-grown' yield accounting software with SIMSCI's OpenYield product and integrate that with three other software applications within the plant. The second part of the initial phase was the 'vertical' integration which was to connect the plant integration solution to the Enterprise Resource Planning (ERP) system, using SAP R/3 for their ERP application.

TECHNICAL OVERVIEW OF INTEGRATION

There are many heterogeneous systems in the plant. OpenYield needed to communicate with all of the main systems: MRP II, Beckman LIMS, and InfoPlus.21. Figure 1 below shows the main systems connected with CPU® IntelliPlant® adapters to TIBCO's Information Bus.



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Figure 1. - High-Level System and Data Flow Diagram

Given the objective to integrate the OpenYield product with the software systems above, to connect them in a similar fashion, and to resolve the lingering integration issues of the plant, TIBCO's message-oriented-middleware product along with CPU®'s IntelliPlant® product were jointly selected by the project team to create a robust communication layer between the different systems.

Integrated Applications

During part one of the initial phase, the four main applications that needed connectivity were: Beckman LIMS, InfoPlus.21, OpenYield, and MRP II system.

Beckman LIMS is a lab information system that runs on OpenVMS. CPU® used the standard call interface to Beckman called Transaction Processing Option (TPO) to communicate with the application.

Aspentech's InfoPlus.21 application is a standard data historian that runs in a Windows environment on both Intel and Alpha platforms. InfoPlus.21 has a sister product, Batch.21, which can communicate through an SQL like interface using ODBC and allows access to data from both systems. The Client needed information from both the Batch.21 and InfoPlus.21 systems, so we chose to communicate with those systems through the ODBC interface.

SIMSCI's OpenYield product is a yield accountant product with visualization tools for modeling the plant systems and applying calculation rules to each element in the plant production model. The OpenYield product ran on Windows NT and used a Access database as the persistent store for the information. The Access database was not deemed a reliable or a robust solution, so we chose to create linked tables between the OpenYield Access database and an Oracle 8 database. We then delivered an Oracle Adapter to complete the integration to the OpenYield product.

The MRP II system is the Client's proprietary Manufacturing Resource Planning system that the Client built specifically for use within the company. This product runs on OpenVMS and required specific SQL like code to be written to access the data.

CPU® created adapters for each one of the applications above. Together with the TIBCO Rendezvous messaging bus, all of the applications could then communicate with each other.

IntelliPlant® Solution

The IntelliPlant® solution uses a design methodology which de-couples the producers and consumers of data, thus making the integration solution 'soft' and 'malleable'. An integration solution of this type along with the correct deployment tools is a great solution for corporate infrastructures because it allows them to be flexible in today's market. The IntelliPlant® solution is a three-tiered architecture. The three tiers are: the messaging layer, the infrastructure layer, and the connectivity layer. The messaging layer for the Client's solution is TIBCO's Rendezvous messaging product, the infrastructure layer is the IntelliPlant® Adapter Framework, and the connectivity is IntelliPlant® adapters. The TIBCO messaging layer is composed of every Rendezvous daemon on the network. The IntelliPlant® Adapter Framework consisted of a 'stack'. The stack is the composition of an adapter development kit, an adapter configuration tool, a message type

repository, and an adapter configuration adapter. The connectivity was an IntelliPlant® adapter for each application involved.

The IntelliPlant® solution is an application integration solution, built on strong publish/subscribe message-oriented-middleware (MOM). IntelliPlant® allows the plant/facility personnel to graphically configure the needed data movements within the plant or enterprise. Thus, no application code is needed once an IntelliPlant® adapter for an application exists. This enables deployments of solutions to be more consistent and allows the service representatives to concentrate on value-added data movement throughout the corporation to fulfill the integration scenarios needed. Furthermore, having quicker deployments of integration solutions also helps a company realize the ROI sooner, increasing shareholder value.

The MOM layer as the underlying communications layer between IntelliPlant® adapters coupled with the IntelliPlant® Adapter Framework allows for adapter developers to rapidly create connectivity to a new system. The MOM layer also allows for anonymous interaction that is both reliable and resilient. Thus, even through network outages and application down time, all messages are delivered consistently and timely.

Timeline

The first part of the initial phase of project was to create the needed adapters and deploy them at the three US plants. The first plant to be integrated took about four months. The second took about a two months, and the third took about a month.

The second part of the initial phase was to create and deploy the vertical solution. This meant connecting to the SAP R/3 system. Osprey, an SAP consultant came in to help with the SAP side of the integration puzzle. The first plant was chosen by corporate to perform the initial integration scenario. That plant required about eight months to totally roll-out. CPU® was involved for the entire duration of the project, but only performed about four man-months of actual work. The rest of the duration was required for the configuration and setup of the SAP system. The second plant was next, and took about four months, during which CPU® required only one month of time, during the factory acceptance test (FAT) for the solution. The third plant was a sub-set of the functionality needed at the second plant and only required about two months. CPU® was involved in the inception of this project and the latter part of the FAT.

The European plant and South American plants were never undertaken due to changing economic climates and ever changing currency exchanges.

Success

The completion of the initial phase of the project by CPU® was a complete success. Our Client continues to utilize the integration system and still, to this day, connects new systems to the IntelliPlant® information bus. The Client not only reports a drastic reduction in maintenance costs, but also reports that the production cost savings and the inventory cost savings exceeded their expectations—allowing them to also obtain additional ROI from their SAP system.

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