# Enterprise Integration

## Provides bi-directional integration to enterprise applications

## Overview

Most manufacturing companies use a Product Lifecycle Management (PLM) for product design and development; and an Enterprise Resource Planning (ERP) system for a high-level management of the company that includes financials & accounting, sales & distribution, human resource management, warehouse management as well as planning and tracking of production orders. It's also common that organizations have in place other type of manufacturing relevant applications, such as document management and training systems. The

Enterprise Integration module provides a robust, bi-directional asynchronous communication mechanism based on a message queued and a queue processor.

As part of an MES implementation project, integration with the ERP is typically a strong requirement due to the information that needs to be exchanged back and forth. Figure 2 contains some examples of productive ERP interfaces.



Figure 1 Critical Manufacturing Enterprise Integration architecture

| From | To | Message | Description |
|------|----|---------|-------------|
| ERP | MES | Master Data Information | ERP sends Master Data information, such as a Material and Work Calendar information to MES so that MES can synchronize the data with the ERP. |
| ERP | MES | Human Resource Information | ERP sends Human Resource information so that the MES can synchronize the Employee Certifications with the ERP. |
| ERP | MES | Production Orders | ERP sends Production Order information so that they can be created or updated in MES. |
| ERP | MES | Warehouse Material Movements | ERP sends raw materials to the MES so that the inventory can be created and tracked in the MES. |
| MES | ERP | Material Requests | MES makes raw material requests to the ERP. |
| MES | ERP | Production Order Operation Confirmations | MES reports operation confirmations to the ERP including time, scrap and consumption information. |

Figure 2 ERP productive integration examples

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## Key Features

- Bi-directional communication – synchronous and asynchronous (buffered) communication between the MES and the other application. The asynchronous communication is particularly important because the other application may not available and also because the calls to the other application may take some time and the MES must not be blocked for the duration of that transaction.

- Persistency of integration messages and a monitoring mechanism that keeps track of the processing state and errors of every exchanged message.
- Special support for SAP so that the MES application can:
  - Receive IDocs acting as an RFC server.
  - Call BAPIs/RFCs.
- Visual workflow to define integration logic and message data structure mapping

### Benefits

- Real-time synchronization between the ERP and the MES
- Reduction in data entry
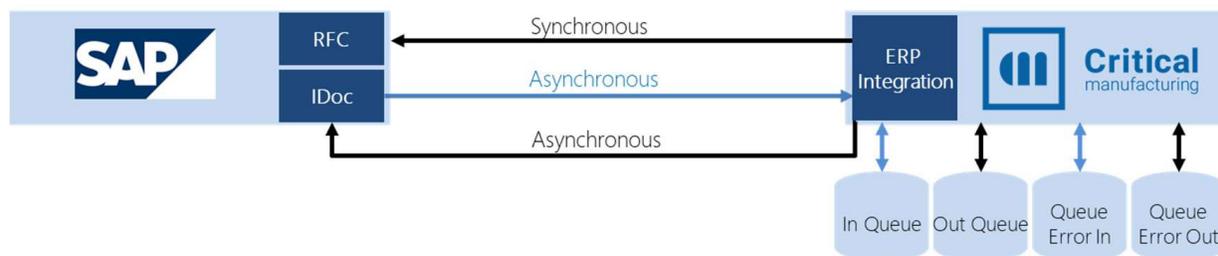
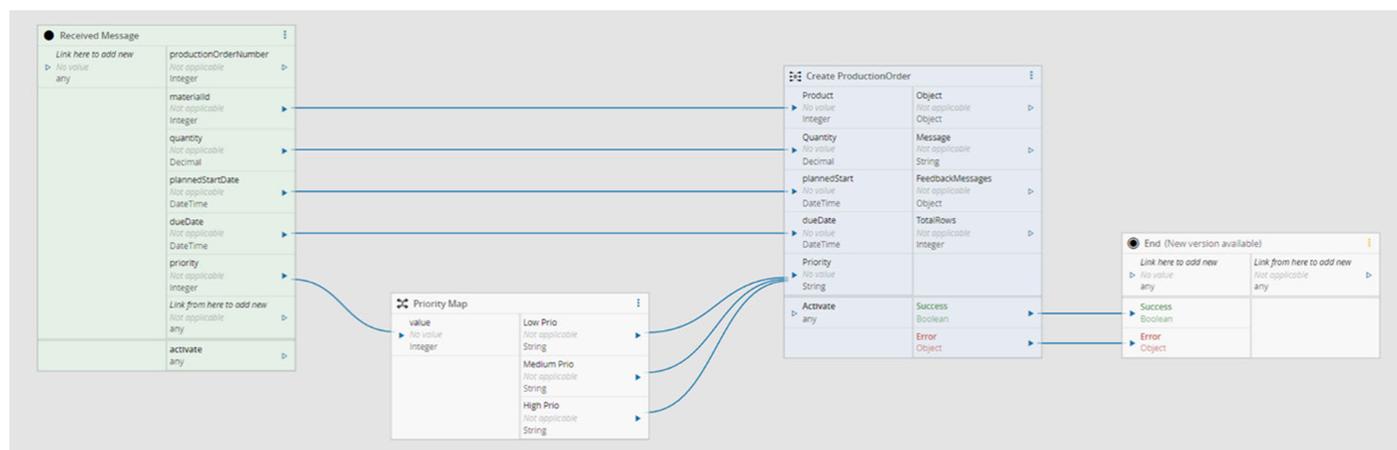- Reduction in the opportunity for errors



Figure 3 ERP Integration Architecture for SAP



Figure 4 Visual workflow for enterprise integration logic

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