What Is Production Process Management?

Manufacturing 3.0: Production Process Management
An Overview of the New Management Paradigm Built on Business Process Management Concepts

- A less costly method to accomplish manufacturing plant information system exchange across silos without systems integration
- Applied business processes are enterprise global standards with granular changes at the business unit and/or plant level
- Easier global visibility to information and your production processes
- The production process layer is proprietary to you
- New generic operations information systems such as MES, maintenance, scheduling, etc. can be purchased at much lower cost

It is time to reevaluate how we look at our information management toolset and examine our business from a process perspective. Information silos cannot be accepted and information can no longer be departmentally owned. We need to orchestrate information into strategic and sustainable competitive advantage processes that support the extended enterprise and include a wide range of stakeholders across the value chain.

Production Process Management (PPM) describes a concept of applying business process management design and tools to the areas of manufacturing plant and supply chain activity management within and across the extended enterprise. The primary idea behind PPM is to center thinking on business functions and activities versus what software package or combination of software packages might be applied. Processes are designed to follow chronological steps of how you want to run the business by connecting and supporting predefined, sequenced events with the correct information in a role-based form for the intended user. A process may be fully electronic, fully or partially manual, or a combination of either. One key thought is that the process is specific to, and alterable to fit, the given business requirement.
These illustrations provide an overview of the typical application hierarchy in most manufacturing companies today. Illustration 1 shows the usual enterprise level applications, including Enterprise Resource Planning (ERP), Product Lifecycle Management (PLM), Supply Chain Management (SCM), etc. Beneath that is the integration layer made up of mostly custom software intended to bridge the gap between the plant application activities and the needs of the enterprise systems. The next lower level is a symbolic display of plant applications used in manufacturing. These are typically stand-alone, departmental data-centric systems. Beneath that are the machine level programmable controllers, other control systems and sensors. The bottom layer suggests the specific operational requirements of the local plant, which could be based on things like product, tradition or labor agreement.

Illustration 2 shows the same hierarchy except the integration layer has been replaced with a process layer. Instead of using software development tools to create and deploy new functions, process development modeling tools are used to collaboratively develop the process using standard modeling language BPMN 2.0. The modeled processes will be supported by data retrieved from the existing applications as part of the process execution functions.

Illustration 3 shows an example of a simple production process where the task is to retrieve the amount of scrap produced from each plant at the end of each shift and calculate the scrap percentage of the finished product produced on that shift. The plant is required to weigh each item of scrap and collect the shift total in a scale-mounted PLC. The PPM platform will initiate this process automatically at shift end by collecting the scrap and finished goods data and making the calculation. The information is then sent to the ERP system as part of the financial and metrics measurement administrative processes.

A major aircraft manufacturer is planning to link its enterprise level applications such as PLM and ERP, and suppliers’ enterprise information systems, to the plant floor using process technology. The most obvious advantages include enterprise-wide incremental process deployment and process revision with minimum disruption to the user; the Gartner described build-to-change strategy rather than a build-to-last approach.
What is PPM?

Production Process Management Justification

In multi-plant, multi-product companies, there is a strong need to blend managerial responsibilities and information management techniques into a systems network as a set of dynamic but consistent processes. PPM answers these needs with effective results.

1. System management through a process layer environment is less disruptive for system users. No more rip and replace to upgrade plant floor or supply chain applications as processes can be deployed incrementally and at the enterprise level or plant level.

2. Applied business processes are enterprise global standards with granular changes at the business unit and/or plant level.

3. Processes provide an individualized user interface that is capable of compliance and validation confirmation.

4. A less costly method to accomplish information exchange without direct systems integration, providing optimization of business processes within and between entities and easy couple/decouple information sharing.

5. The production process layer is proprietary to the user company, providing the basis for building a sustainable competitive advantage through production process design and execution.

Applying Production Process Management

A major food products company has recently launched a PPM initiative to connect the enterprise ERP system to 80-plus manufacturing facilities. Each facility has the usual complement of application silos (OEE, scheduling, MES, maintenance, etc.) but the PPM objective is to build value through processes that can be deployed to a number of plants rather than developing integration code and one-off information tools for each facility. In another food company PPM is planned to build a recipe package by retrieving data from four enterprise system sources. The ERP system begins the process by assigning a production order to a plant. Based on the product and the plant location, the PPM is to retrieve the correct production information specific to that instance of production from four enterprise systems, and download the recipe package to the plant. Later PPM versions will see production parameters (i.e. oven temperature, conveyor speed) directly loaded to devices and production manager’s devices.

A major household battery manufacturer has been pursuing a process approach based on a less complicated three level architecture seen in Illustration 4. This is easier, simpler and less costly than traditional point-to-point integration methods.

This brief overview of PPM is just a starting point. Review other material on our website or contact us for more information.