



## The Priority™ Enterprise Management System

# Factory Modeling

### Contents

Introduction.....	2
Parts.....	3
Bills of Materials and Revisions.....	3
Engineering Change Orders (ECO).....	4
Part Routings.....	4
Operations.....	4
Work Cells.....	5

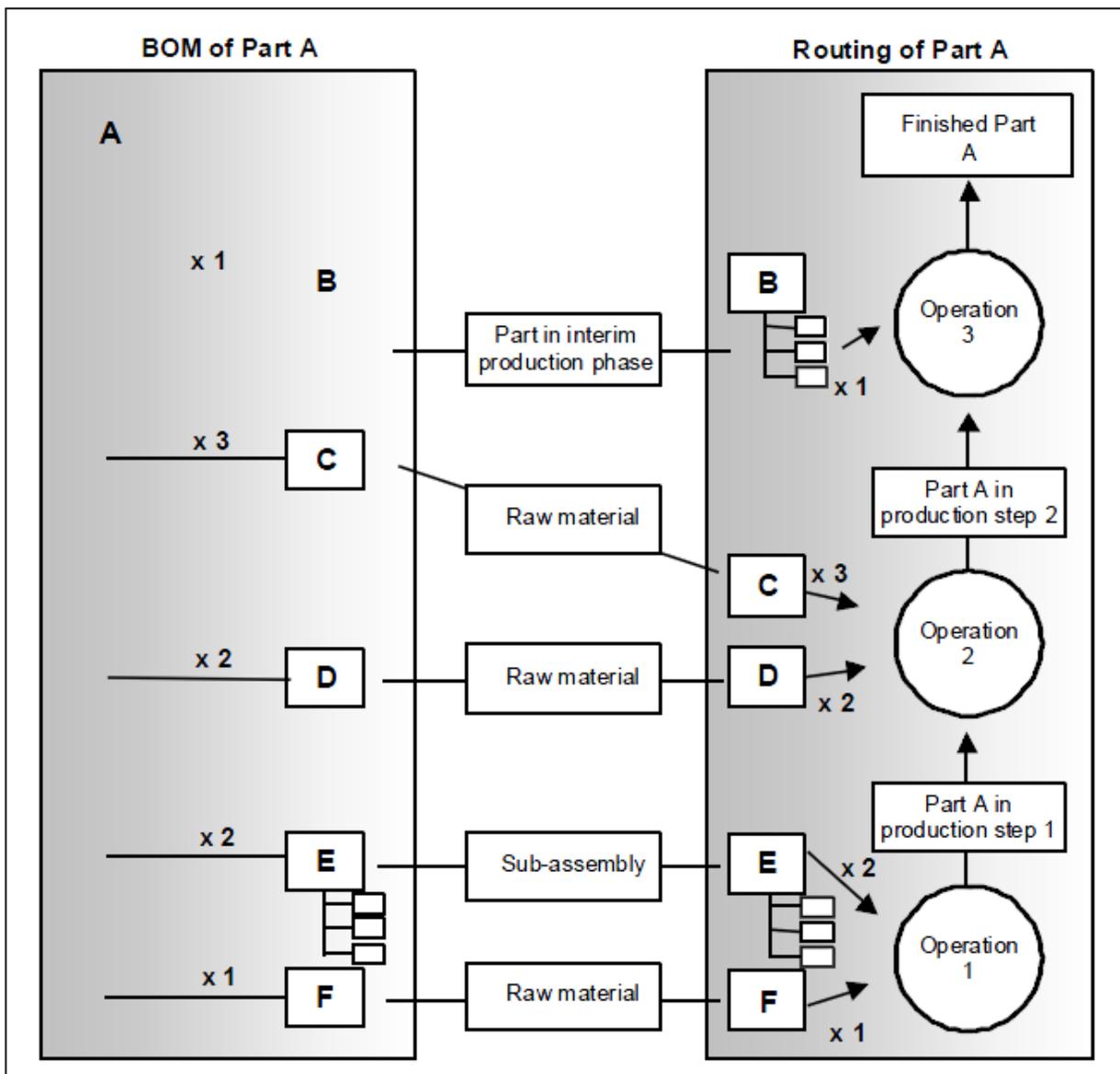
## Introduction

Factory modeling encompasses all the definitions required for management of production in general and production planning (finite- and infinite-capacity scheduling) in particular: parts, the operations performed upon them, the work cell in which each operation is carried out, and the routing of each part.

**Priority** distinguishes between the part's bill of materials (BOM) and its routing:

The BOM mainly refers to quantitative relationships between the parent part and its child parts, as well as the operation in the parent's routing at which the child part is needed. One of **Priority**'s user-friendly features is its enhanced **Part Explorer**, which graphically displays the BOM for any part: by clicking on a part in the display, its child parts are displayed in a hierarchical format.

In contrast, the *routing*, which can be shared by several parts, refers to the specific operations executed on the part, as well as the work cells in which these operations are carried out. Required production resources and other parameters can be determined at the level of either the routing or the part.



## Parts

**Priority** requires the definition of various attributes for each processed part, including parameters affecting production planning and control:

- **Part type** – raw material, processed part or *other* (a classification primarily reserved for non-standard parts).
- **Kit components** (for issue to a kit).
- **Phantom parts** – The system identifies and skips over phantoms, referring directly to their child parts. No inventory is maintained for phantoms.
- **Alternate parts**, i.e., parts that can substitute for another part. An alternate part can be used (during material requirements planning or production planning) to resolve problems of material shortages. **Priority** provides the tools for precise control of alternate part usage; you can designate Part A as an alternate for Part B only when the parent is Part C.
- **Lead times** for purchased parts; **production time** (both for machinery and labor) for processed parts.
- **Bill of materials and revisions**.
- **Engineering Change Orders (ECO)**.
- **Part routing**.
- **Operations** (steps) executed on the part.
- **Work cells**.
- **Tooling** required during production.
- **Bar codes** (which can be input via bar-code readers). These can be printed on labels, using **Priority**'s labeling mechanism.
- **Production planning parameters** – quantities to process, production time, set-ups, scrap.
- **Documentation**: specifications, blueprints, diagrams, procedures, instructions for production.

## Bills of Materials and Revisions

**Priority** supports multi-level bills of materials, with an unlimited number of levels and an unlimited number of child parts at each level.

Bills of material are created by defining each level separately, i.e., defining the relationship of the parent part to its direct children. This allows for the creation of easy-to-manage BOMs with an infinite number of levels. You can even include child parts for informative use, which are not taken into account by the **Backflush**, MRP or production planning.

The quantitative relationship between a child and parent part can be defined as a constant (e.g., four legs to one table) or as a variable (e.g., the quantity of paint needed for the table is a function of its area).

The parent-child relationship defines the operation (step) in the parent's routing at which the child part is required, as well as the production step at which the child part is used (relevant when the child part is used before it is fully processed).

You can specify the coordinates of each child's physical location in the construction of its parent part (i.e., X, Y, Z), as well as designate the position label or symbol (e.g., C15, R1 in an electronic circuit).

Construction of a bill of material is quick and easy, supported by utilities for copying and revising existing BOMs. **Priority** also provides an easy-to-read graphic representation of the BOM and supports the maintenance of a variety of engineering revisions for it.

You can maintain revisions both of the parts themselves and their BOMs. For each revision, an effect date and procedure for authorizing the revision are designated. MRP (materials requirement planning) and finite capacity scheduling are always run for the revision that is currently in effect. If work orders are created for the part, revisions will be maintained for each work order.

## Engineering Change Orders (ECO)

The system allows you to track engineering changes that were made during production of a part. For each change you can document details of the change, the date of the change, parts that have been changed as a result, and the like. You can also link part revisions and BOM revisions to engineering changes. The system tracks those revisions that have been influenced by the change, as well as work orders that have been opened in accordance with these revisions.

## Part Routings

Each part has a single routing, i.e., a unique set of operations executed in a predefined order. There are a number of advantages to defining a routing:

- It enables you to link child parts to their parents at a given operation, thereby generating production demands in keeping with the progress of the manufacturing process.
- It facilitates tracking of WIP by allowing you to report each phase of production (operation) separately.
- It precludes the need to create a sequence of part numbers used merely as indicators of the production step.

The same routing can be assigned to various parts — even if they have different BOMs or other attributes. The system includes a number of predefined routings, such as a fictive routing for a phantom, an issue routing for raw materials, and an assembly routing for warehouse assemblies.

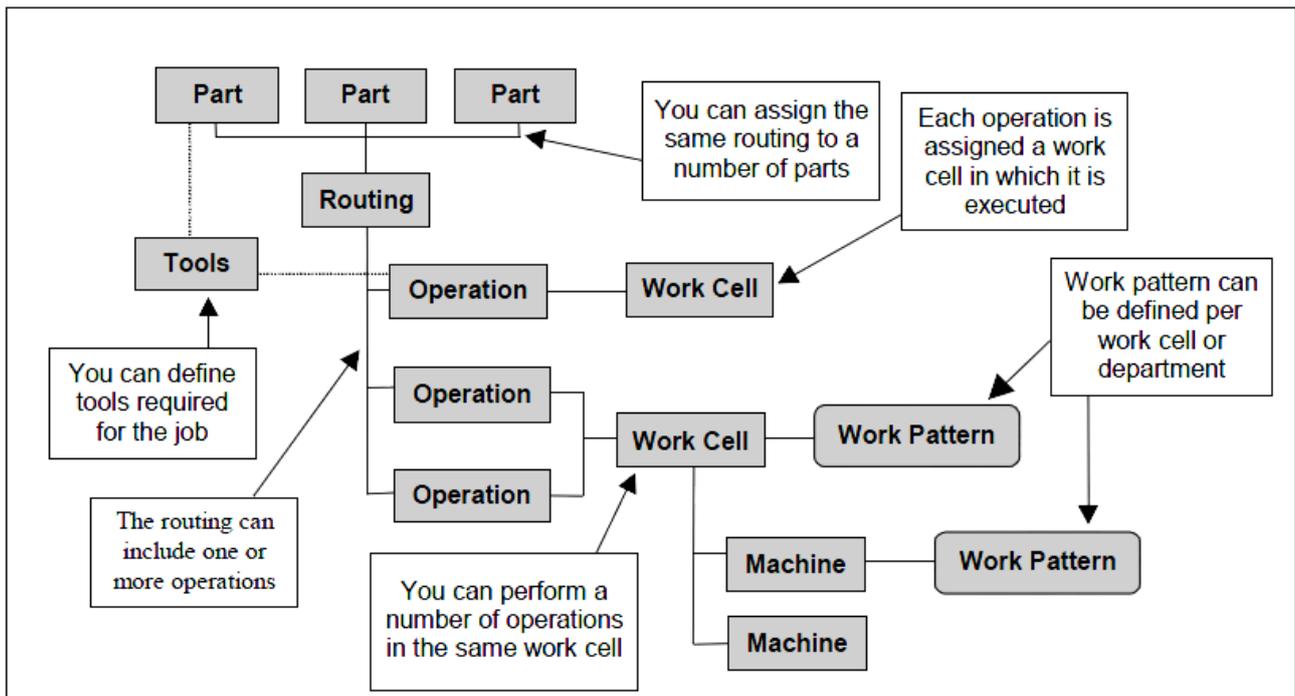
## Operations

Each part routing consists of one or more operations. Each operation is executed within a work cell and is contingent upon the availability of production resources that may also be needed for other operations performed at the same work cell.

An operation can be included in the routing of more than one part.

The relationships between a part and the operations executed upon it are determined by a number of parameters taken into consideration during MRP or production planning.

You can define alternate operations, which are often used in production planning to speed up production by relieving the load on the work cell at which the main operations are executed.



## Work Cells

A work cell represents a machine or group of machines that functions as a production resource and belongs to a given department. This resource is constrained by a work pattern — a timetable defined in terms of shifts, work days and work hours — and work exceptions — deviations from that timetable caused by a shut-down of the work cell, holidays, unplanned extra hours and the like. Work patterns and exceptions can be assigned to an entire department or to specific work cells.

Production planning is run per work cell, taking into account its work calendar, the number of (identical) machines it includes, required set-up operations, whether it has finite or infinite capacity, and so forth. Work cells are also included in the work plan you can generate by MRP.

You can designate alternate work cells, which serve to relieve workloads (by replacing or supplementing the main work cell) during production planning. An alternate work cell consists of the same machines performing the same operations, but with independent work calendars.

When production is carried out by a subcontractor, the latter is assigned a work cell that is treated like all others, including the designation of operations executed by the subcontractor.