**CRAFTERP**

**📦 1. Product Types in Manufacturing**

Before any production happens, we need to classify products properly.

**🔹 Raw Materials**

* Items purchased from suppliers.
* They **cannot be sold directly** (usually) but are used in production.
* Example (Wooden Furniture Company):
  + Wooden Planks
  + Table Legs
  + Screws
  + Glue / Varnish

**🔹 Semi-Finished Products (Unfinished Products)**

* Products that are not ready for sale but **produced in intermediate steps**.
* They are later consumed to produce a finished good.
* Example:
  + A **Tabletop** produced by gluing planks together.
  + A **Chair Frame** without cushions.

**🔹 Finished Products**

* Final goods that can be sold to customers.
* They are produced using raw materials and/or semi-finished goods.
* Example:
  + Wooden Table
  + Wooden Chair
  + Wooden Cabinet

👉 Why this classification matters:  
Because the **Bill of Materials (BOM)** needs to know if an item is consumed in production or if it’s the final output.

**🧾 2. Bill of Materials (BOM)**

A **BOM is the recipe** for making a product.  
It defines:

1. **Which materials** are needed (and in what quantity).
2. **Which operations** are required (and in what sequence).
3. **Which work centers** (machines, stations, or workers) are used.

**Example: BOM for 1 Wooden Table**

* **Materials:**
  + 1 Tabletop
  + 4 Legs
  + 12 Screws
  + 1 Bottle Varnish
* **Operations:**
  + Assemble Legs + Tabletop (Work Center = Assembly Line, Duration = 40 mins)
  + Screw parts together (Work Center = Drilling Station, Duration = 15 mins)
  + Apply Varnish (Work Center = Paint Floor, Duration = 30 mins)

👉 BOM ensures standardization. Every time you produce 1 table, it consumes exactly these items and follows these steps.

**📑 3. Manufacturing Order (MO)**

An **MO is a production plan/order** raised by the Manufacturing Manager.  
It tells the system:

* What product is being produced
* How many units
* When it should start and finish
* Who is responsible

**Example MO:**

* **Product:** Wooden Table
* **Quantity:** 10
* **Deadline:** Friday, 5 PM

👉 What happens when MO is created:

* System multiplies BOM by quantity:
  + 10 Tabletops
  + 40 Legs
  + 120 Screws
  + 10 Bottles Varnish
* Inventory system checks if stock is available.
* If stock is short → Purchase Order (PO) for missing items.
* System **creates Work Orders** automatically for each operation in BOM.

**🛠️ 4. Work Orders (WO)**

A **WO is a task assigned to an operator or work center**.  
Each operation in BOM = one WO.

**Example from above MO:**

* **WO1:** Assemble 10 Tabletops + Legs (Assigned to Alex, Assembly Line, 40 mins)
* **WO2:** Drill & Screw tables (Assigned to Maria, Drilling Station, 15 mins)
* **WO3:** Varnish tables (Assigned to John, Paint Floor, 30 mins)

**Operator Workflow:**

* Operator logs in, sees their assigned WO.
* Status changes: **Planned → In Progress → Done**.
* Operator can add:
  + Start time, end time (for time tracking)
  + Comments/issues (e.g., “Machine broke, caused 1-hour delay”)

👉 This gives **real-time tracking** of production progress.

**📦 5. Inventory Movements (Stock Ledger)**

Here’s the **magic**:  
Inventory updates **automatically** as WOs are completed.

**Example for 10 Tables MO:**

* When **WO1 starts** → System **reserves stock** (40 Legs, 10 Tabletops).
* When **WO1 completes** → Raw materials **are consumed** (removed from stock).
* When **WO3 completes** (last step) → Finished Goods (10 Tables) **are added to stock**.

**Stock Ledger Entry Example:**

| **Date** | **Product** | **Reference** | **Stock In** | **Stock Out** | **Balance** |
| --- | --- | --- | --- | --- | --- |
| 20-Sep-25 | Legs | MO#123 | 0 | 40 | 200 → 160 |
| 20-Sep-25 | Tabletop | MO#123 | 0 | 10 | 50 → 40 |
| 21-Sep-25 | Wooden Table | MO#123 | 10 | 0 | 20 → 30 |

**📊 6. Reports & Dashboards**

After production:

* **Administrator/Manager** can see dashboards:
  + Total MOs in progress
  + Orders completed today
  + Delayed orders
  + Machine utilization
  + Worker efficiency (WO duration vs planned)
* **Inventory Manager** sees:
  + Stock levels
  + Raw material usage
  + Shortages and purchase needs

**🔄 7. Process Flow in Sequence**

Let’s combine everything:

1. **Define Products**
   * Raw materials, Semi-finished, Finished goods
2. **Define BOM**
   * Recipe for each finished/semi-finished product
3. **Create MO**
   * Manager says: “We need X products by Y date”
4. **System Checks Stock**
   * Ensures raw materials available
   * Triggers PO if missing
5. **System Creates WOs**
   * Tasks assigned to operators/work centers
6. **Operators Execute WOs**
   * Start → Pause → Complete
   * Track duration, issues
7. **Inventory Updates**
   * Materials consumed, Finished goods produced
8. **Dashboards/Reports**
   * Managers track KPIs
   * Inventory manager checks stock
   * Boss sees overall efficiency

**💡 Summary in Simple Terms**

* **BOM = Recipe** (What’s needed + How to make it)
* **MO = Order** (We need 10 tables by Friday)
* **WO = Tasks** (Alex assembles, Maria drills, John varnishes)
* **Inventory = Accountant** (Tracks every screw and table automatically)
* **Dashboard = Boss’s Eyes** (Real-time progress, delays, efficiency)

This process ensures **efficiency, accuracy, and accountability** in manufacturing.

# CraftERP Manufacturing Management Process Flow

## **1. Inventory Setup (Before Production Starts)**

You **must load your warehouse with raw materials first**.

🔹 Steps (UI):

1. Go to **Inventory → Products → Add Product**
   * Add raw materials like Wooden Plank, Table Leg, Screws, Glue, Varnish.
   * Set product type = **Raw Material**.
   * Add unit of measure (pcs, liters, kg, etc).
2. Go to **Inventory → Stock → Add Stock**
   * Select Product = Screws → Add 500 units.
   * Product = Table Legs → Add 200 units.
   * Product = Wooden Plank → Add 50 pcs.
   * Product = Varnish → Add 20 bottles.

👉 **Button needed:**

* + Add Product (to define items).
* + Add Stock (to load initial quantities).

## **2. Define Semi-Finished & Finished Products**

Now define the products you will produce.

🔹 Steps (UI):

1. Go to **Inventory → Products → Add Product**
   * Add Tabletop → Type = Semi-Finished.
   * Add Wooden Table → Type = Finished Product.

👉 **Button needed:**

* + Add Product
* Dropdown for Product Type = Raw, Semi-Finished, Finished.

## **3. Create Bill of Materials (BOM)**

Each finished/semi-finished product needs a recipe.

🔹 Steps (UI):

1. Go to **Manufacturing → BOM → Create BOM**
   * Product: Wooden Table
   * Quantity: 1
2. In **Materials Tab** → + Add Material
   * 1 × Tabletop
   * 4 × Legs
   * 12 × Screws
   * 1 × Varnish
3. In **Operations Tab** → + Add Operation
   * Operation 1: Assemble (Work Center = Assembly Line, Duration = 40 min).
   * Operation 2: Screw Parts (Work Center = Drilling Station, Duration = 15 min).
   * Operation 3: Varnish (Work Center = Paint Floor, Duration = 30 min).

👉 **Buttons needed:**

* + Create BOM
* Inside → + Add Material, + Add Operation

## **4. Create a Manufacturing Order (MO)**

This is the production order for a batch of finished goods.

🔹 Steps (UI):

1. Go to **Manufacturing → MO → Create MO**
   * Product = Wooden Table
   * Quantity = 10
   * Deadline = 25 Sep
2. System automatically fetches BOM for Wooden Table × 10.
   * Reserves 10 Tabletops, 40 Legs, 120 Screws, 10 Varnish.
   * Creates Work Orders.

👉 **Buttons needed:**

* + Create MO
* Auto-display: Required Materials & Operations.

## **5. Work Orders (Execution by Operators)**

Each operation in the BOM generates a WO.

🔹 Steps (UI):

1. Go to **Manufacturing → Work Orders**
   * WO1: Assemble Tables (Status = Planned).
   * WO2: Screw Tables.
   * WO3: Varnish Tables.
2. Operator selects their WO → clicks Start.
   * Status changes → In Progress.
   * After finishing → click Mark as Done.

👉 **Buttons needed:**

* Start
* Pause
* Mark as Done

## **6. Inventory Updates (Automatic Stock Movement)**

* When WO starts → Raw materials are **reserved**.
* When WO finishes → Raw materials are **consumed** (stock decreases).
* When final WO finishes → Finished goods are **added to inventory**.

🔹 Example:

* 10 Tables produced → 10 added to Wooden Table stock.
* 40 Legs, 120 Screws, 10 Varnish removed from stock.

👉 **System action (no button):**

* Auto stock movement log in Inventory → Stock Ledger.

## **7. Quality Check (Optional)**

* After final WO, manager can verify product quality.
* If passed → move to “Finished Goods Stock”.
* If failed → mark as “Scrap” or “Rework”.

👉 **Buttons needed:**

* Approve
* Reject → Scrap
* Send to Rework

## **8. Reports & Dashboards**

* Managers see:
  + Total MOs in progress.
  + Completed WOs.
  + Material consumption.
  + Worker productivity.
* Inventory Manager sees:
  + Stock of raw materials.
  + Stock of finished goods.
  + Reorder alerts.

👉 **Buttons needed:**

* View Dashboard
* Filters (By Product, Date, Work Center).

# 🔄 Full Sequence Recap (Buttons + Steps)

1. **Inventory Setup** → + Add Product → + Add Stock
2. **Define Finished/Semi Products** → + Add Product (Type selection)
3. **Create BOM** → + Create BOM → + Add Material → + Add Operation
4. **Create MO** → + Create MO (Auto pull BOM + auto WOs)
5. **Execute WOs** → Start → Mark as Done
6. **Inventory Updates** → Auto-consume raw materials, auto-add finished goods
7. **Quality Check** → Approve / Scrap / Rework
8. **Reports** → View Dashboard