Testing Manual

MRPeasy

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Part 1. Get a quick overview with demo data

Tutorials in this section will guide you through a couple of important workflows using the demo dataset (with wooden tables).

We recommend to start entering your own test data, a process which is described in Part 2, only after completing these tutorials.

For the start, freely explore all the sections (and make sure to have demo data in the system).

MRPeasy has the following main sections:

- Dashboard – quick overview of important indicators
- CRM – sales and order management
- My production plan – production reporting
- Production planning – production management
- Stock – inventory management
- Procurement – purchasing
- Accounting – standard accounting module (disabled by default)

Plus, additional sections:

- Settings – software settings
- Demo data and videos – demo videos, demo data upload, and options to empty the database fully or partially
- Free use – options to extend the free trial period
- Help Center – link to help resources like FAQ and User Manual

On top right, click on "Quick help" to show the description of the page you are on.

For navigation, click on section icons on the top menu bar, or use "Back" buttons to move to the previous page.
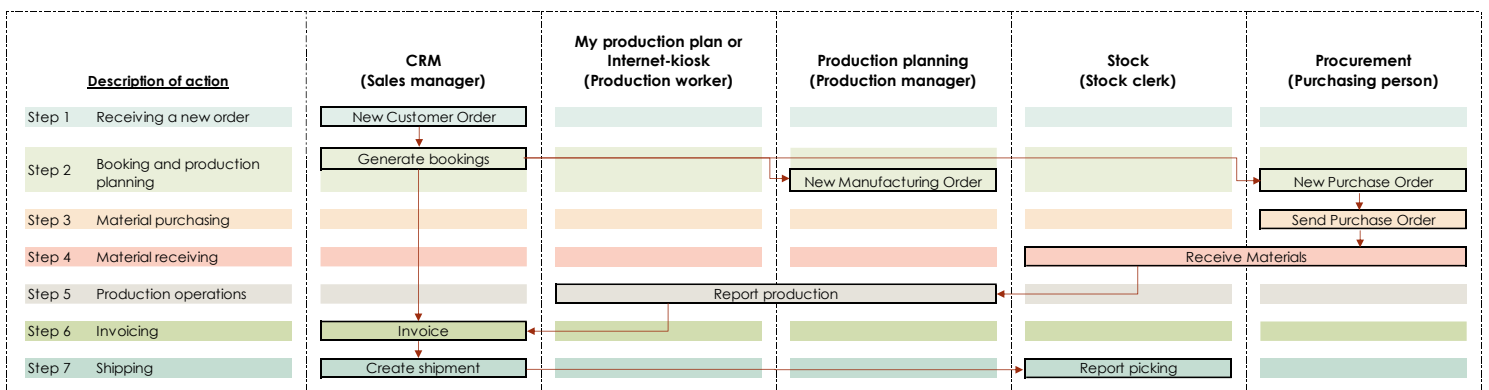
Once you have explored the sections, start following the tutorials below, which demonstrate many main workflows in the system.

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1.1. Tutorial 1 – Recording an order and following its completion using automatic production planning

This is one of the most important tutorials to follow if this is your first experience with MRPeasy. You will see normal day-to-day actions - how to record an order, process it, purchase, manufacture, invoice, and ship.

MRPeasy is perfect for both make-to-order and make-to-stock production modes.

The image below exemplifies the typical workflow of managing sales orders. In case if products are not in stock, then production must also be planned; in case if products are in stock, then the available products will be booked (reserved) and you can directly continue to shipping.

Description of action		CRM (Sales manager)	My production plan or Internet-kiosk (Production worker)	Production planning (Production manager)	Stock (Stock clerk)	Procurement (Purchasing person)
Step 1	Receiving a new order	New Customer Order				
Step 2	Booking and production planning	Generate bookings		New Manufacturing Order		New Purchase Order
Step 3	Material purchasing					Send Purchase Order
Step 4	Material receiving				Receive Materials	
Step 5	Production operations		Report production			
Step 6	Invoicing	Invoice				
Step 7	Shipping	Create shipment			Report picking	

This tutorial demonstrates how different departments in the company work together, you will take the role of different people, each of whom normally have limited access to only specific sections. This tutorial also lightly touches on how automatic production and material planning works. In the next tutorial we will also demonstrate how assisted planning works.

Before getting started:

1. Go to section "Demo data and videos".
2. If you have modified the demo data, then empty the database and re-fill the database with demo data.
3. Choose to delete all transactions from the system with button "Delete all orders and stock".

If it's your first time with MRPeasy it's easier to follow the logic of the system this way. It will look like it's the morning of the first day of business, everything is nice and clean – no previous orders, no inventory, but everything is set up and ready for action.

Tutorial steps:

1. **Create a new confirmed Customer Order (CO).**
   a. Go to "CRM -> Customer orders" section and click on "+" to add a new customer's order.
   b. Choose the customer name from the dropdown menu.
   c. Change order status to "Confirmed".
   d. In the products section, enter that item "Wooden table" has been ordered. Put in any quantity and price you wish.
   e. Save.

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Now you have recorded a CO, which is confirmed, and should go into planning.

2. **Create bookings.**
   a. In the CO details click on "Check stock and book items".
   b. Choose "Create MOs for missing products" for auto-creation of Manufacturing Orders (MO).
   c. Choose "Create POs for missing parts" for auto-creation of Purchase Orders (PO).
   d. Click on "Book all items" and confirm.

   You will be taken back to the Customer Order page. The software has automatically scheduled a MO for the ordered products and booked (i.e. reserved) these items for this CO. And PO for the materials for production have been created.

3. **Send the Purchase Orders (PO).**
   a. Navigate to "Procurement -> Purchase orders" section.
   b. Open one of the POs.
   c. Click "Send PO" on the top right, which will open your e-mail client with a prefilled e-mail and a link to the purchase order PDF. This action will also record the "Ordered date" of the PO and that will mark its status as "Ordered".
   d. Alternatively, if you do not use "Send PO" button you can download the PDF. But make sure to enter the "Ordered date".

   Bonus, if you receive a shipping confirmation, you can also record the shipping date on the PO, and its status will change to "Shipped".

4. **Receive the materials.**
   a. Navigate to "Procurement -> Purchase orders" section.
   b. Open the PO.
   c. Report receipt:
       i. Enter the "Arrival date". (If software setting "Several invoices per PO = NO", default setting.)
       ii. Or enter a purchase invoice at the bottom of the PO. (If "Several invoices per PO = YES".)
   d. Save.
   e. Repeat the process with other POs, if there are any.

   Now the materials have been accepted into stock, and we're ready to start production.

5. **Report production.**
   There are three ways to report production:
   a. real-time in the "My production plan",
   b. real-time in the "Internet-kiosk",
   c. and quick one-click finishing by the manager after production.

   For one-click finishing:
   a. Navigate to "Production planning" section.
   b. Open the MO.

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c. Scroll to the "Operations" section of the page and check that each operation is reported. Edit the operation and fill in the information if something is incorrect or missing.
d. Scroll to the bottom part of the MO page and click "Finish production as planned".

For other options of reporting see the tutorials for reporting in the "My production plan" and the "Internet-kiosk".

6. **Invoice the customer.**
   a. Navigate to the CRM section, and open the CO details.
   b. Scroll to the Invoices section in the CO, click "+" to add new.
   c. Change type to "Invoice".
   d. Change status to "Unpaid".
   e. Save.
   f. Click "Send e-mail", or simply download the PDF.
   g. Click "Back" to go back to CO details.

You can invoice the customer any time and in parts, and can record payments.

7. **Ship the products.**
   a. In the Customer Order details scroll to Shipments section, or go to "Stock -> Shipments", and click "+" to add new.
   b. The details are prefilled, click to save.
   c. Click "Pick all items" (on right hand side) and confirm.

The shipment, when created initially, is a plan for shipment, you can print out required documents from here. Once items are shipped, the picking is reported - usually, this is done via the Stock section by the stock clerk.

As a reminder, how to automatically place Manufacturing Orders (MO) and Purchase Orders (PO):

	Action	Details	Result
Step 1	Open Customer Order	Open a Customer Order in the CRM	
Step 2	Book materials/products. Have the software automatically plan production operations, and material purchases, if necessarry.	1. Click "Check stock and book items" 2. Check boxes for automatic MO and PO creation 3. Click "To book items"	Products are booked for this order from stock. New Manufacturing Order(s) automatically created, if needed. New Purchase Order(s) automatically created, if needed. This is done by the salesperson, or production manager (once the order status is set to "Confirmed")

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1.2. Tutorial 2 – Recording an order and following its completion using assisted production and materials planning

This is an advanced tutorial, especially important to follow whether you're new, or already experienced. It shows how MRPeasy assists production planner and purchaser in their operations. In many organizations, this is the standard way of using MRPeasy.

To easily follow this tutorial:

- Make sure that you are using the standard demo data set, which can be uploaded in section "Demo data and videos".
- Also, make sure to delete all orders and stock for easier following and for getting the expected results.

Tutorial steps:

0. **Prerequisite: Set the reorder point value.**
   a. Navigate to "Stock -> Items" section.
   b. Mark all items for editing (on the right-hand side), click on paint roller icon to bulk edit.
   c. In the topmost "Reorder point" field enter value "0" (zero) or higher. You will see this update all items reorder point value.
      (Up to 100 items can be updated at once with bulk editing)
   d. Save.

   Setting the "Reorder point" is necessary for the next steps to work!

1. **Create a new confirmed Customer Order (CO).**
   a. Go to "CRM -> Customer orders" section and click on "+" to add a new customer's order.
   b. Choose the customer name from the dropdown menu.
   c. Change order status to "Confirmed".
   d. In the products section, enter that item "Wooden table" has been ordered. Put in any quantity and price you wish.
   e. Save.

2. **Create negative available inventory by booking items.**
   a. In the same CO, click "Check stock and book items".
   b. Click "Book all items" and confirm.

   Since not enough products were available, this results in a negative available inventory quantity of the product, which can be seen at "Stock -> Items". Now the production planner can use this information for planning.

3. **Open the Critical on-hand report.**
   a. Go to "Stock -> Critical on-hand" section or open it from the "Dashboard" by clicking on the "Items below reorder point" indicator.

   This report shows which items need to be produced, and which materials need to be purchased.

4. **Create Manufacturing Order(s) (MO) from the Critical on-hand report.**

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a. At the end of the "Wooden table" article line, there is a button to create a Manufacturing Order.
b. This will take you to MO planning screen and prefill it.
c. Save.

You might have noticed that the Bill of Materials line was red in the MO planning screen. This was because there were not enough materials in stock (if all stock levels were deleted previously). In the saved MO details, you will also see that materials are shown in red; this means that no materials have been booked for this MO. You might also notice that the planned start date of production is in the future - this is based on the lead time of materials.

5. **Create Purchase Orders (PO).**
   a. Navigate to the "Procurement -> Critical on-hand" or "Procurement -> Requirements" report.
   b. Create POs for the materials from the report by using the PO creation buttons (with shopping cart icon).
   c. Send PO by clicking "Send PO" button in the PO. Or record "Order date" manually.

6. **Receive materials.**
   a. Open the PO.
   b. Report receipt:
      i. Enter the Arrival date. (If software setting "Several invoices per PO = NO", default setting.)
      ii. Or enter a purchase invoice at the bottom of the PO. (If "Several invoices per PO = YES".)
   c. Save.

The materials have arrived, manufacturing can now start.

7. **Report production.**
   There are three ways to report production:
   d. real-time in the "My production plan",
   e. real-time in the "Internet-kiosk",
   f. and quick one-click finishing by the manager after production.

   For one-click finishing:
   e. Navigate to "Production planning" section.
   f. Open the MO.
   g. Scroll to the "Operations" section of the page and check that each operation is reported. Edit the operation and fill in the information if something is incorrect or missing.
   h. Scroll to the bottom part of the MO page and click "Finish production as planned".

   For other options of reporting see the tutorials for reporting in the "My production plan" and the "Internet-kiosk".

8. **Invoice the customer.**
   a. Navigate to the CRM section, and open the CO details.
   b. Scroll to the Invoices section in the CO, click "+" to add new.

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c. Change type to "Invoice".
d. Change status to "Unpaid".
e. Save.
f. Click "Send e-mail", or simply download the PDF.
g. Click "Back" to go back to CO details.

You can invoice the customer any time and in parts and can record payments.

9. **Ship the products.**
    d. In the CO details scroll to the Shipments section, or go to **Stock -> Shipments**, and click "+" to add new.
    e. The details are prefilled, click to save.
    f. Click "Pick all items" (on right hand side) and confirm.

The shipment, when created initially, is a plan for shipment, you can print out required documents from here. Once items are shipped, the picking is reported - usually, this is done via the Stock section by the stock clerk.

As a reminder, how to have MRPeasy assist you in production planning and purchasing, if you do not use automatic Manufacturing Order (MO) and Purchase Order (PO) creation:

Action		Details	Result
Step 1	Open Customer Order	Open a Customer Order in the CRM	
Step 2	Book materials/products	1. Click "Check stock and book items" 2. Click "To book items"	Products are booked for this order from stock. If product was not in stock, negative inventory has been created. This is done by the salesperson.
Step 3	Planning manufacturing operations	1. Open "Dashboard -> Min. stock" or "Stock -> Critical on-hand" 2. Create Manufacturing Orders	Materials are booked for these Manufacturing Orders. If some material was not In stock, negative inventory has been created. Products from these Manufacturing Orders are automatically booked for the Customer Order(s). This is done by the production manager
Step 4	Purchasing	1. Open "Dashboard -> Min. stock" or "Procurement -> Critical on-hand" 2. Create Purchase Orders	Materials in these Purchase Orders are automatically booked for the Manufacturing Orders, which require these. This is done by the purchaser.

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1.3. Tutorial 3 – Production reporting by worker using "My production plan"

The "My production plan" is the only section the production workers need access. This is a highly detailed view (as opposed to the "Internet-kiosk"). All tasks that have been assigned to the worker are seen there. The worker can view the tasks in a calendar format, or in a list view.

You can manage the user access rights at **Settings -> Human resources -> Users**.

Tutorial steps:

1. **Create a Manufacturing Order.**
    a. Navigate to "Production planning -> Manufacturing orders" section.
    b. Click "+" to add a new MO.
    c. Choose to manufacture one "Wooden table"
    d. On the Bill of materials line, click "Edit" (button with pencil icon).
    e. In the Operations section, assign operations to the desired worker. **In this case, assign these to yourself** (or you will not see it in your "My production plan").
    f. Click "Back" and save the MO.

    If an MO is already saved, if necessary, then you can reassign workers in the "Operations" section of the MO, when you open the MO details at "Production planning -> Manufacturing orders".

2. **Navigate to My production plan.**
    a. Explore the calendar and list view – buttons to change view are on top right.

3. **Open an operation.**
    a. This will take you to the reporting screen of a Manufacturing Order.

4. **Report the operation start time.**
    a. In the Operations section, find your operation, and click on "Start" button, at the end of the line.

    The start time is now recorded.

    In addition, at **Settings -> System settings -> Software settings** it is possible to select if the worker can see other operations in the same MO, which are assigned to other workers, or not.

5. **Report material consumption.**
    a. On the top right of the Materials section, click on the shopping cart icon "Consume parts for ready products" and enter the quantity of products made. This will consume materials based on the Bill of Materials of the product.
    b. Or, on a material line click on the shopping cart icon "Consume" and enter the quantity of the material consumed.
    c. If you need to add additional or other materials, click on the "+" button.

6. **Report the end time and quantity produced**
    a. On the same operation line, click on "Pause" or "Finish" button to record end time.
    b. Enter the quantity produced.

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If the actual final quantity is different from planned, it is no problem. The software will ask you when finishing the last operation, if the MO quantity should be updated.

7. **Finish the MO when the last operation is done.**
    a. Click on "Finish production".
       If some booked materials have not been marked consumed, choose to consume or release these.

       If after production the list of consumed materials should be amended, it can be done by the manager by opening the MO details at "Production planning -> Manufacturing orders" and changing the materials and/or quantities.

       If for any reason the finished MO final quantity should be updated, it can be done by the manager by opening the MO details at "Production planning -> Manufacturing orders" and changing the quantity of the MO.

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1.4. Tutorial 4 – Production reporting by worker using "Internet-kiosk"

The "Internet-kiosk" is the only section the worker needs access to. It is a simplified reporting screen (as opposed to "My production plan") designed for comfortable use on a smartphone or a tablet but can be easily used on a computer as well. All tasks that have been assigned to the worker are seen there.

Important! A user for a worker needs to be added with Internet-kiosk access. The first user of the account (i.e. the administrator) cannot use the Internet-kiosk!

Tutorial steps:

0. **Prerequisite: Create a user with access to the Internet-kiosk only.**
   a. Navigate to "Settings –> Human resources"
   b. Click "+" to add a new user.
   c. Fill user details.
   d. Give Update access **only** to "Internet-kiosk mode"

1. **Create a Manufacturing Order (MO).**
   a. Navigate to "Production planning -> Manufacturing orders" section.
   b. Click "+" to add a new MO.
   c. Choose to manufacture one "Wooden table"
   d. On the Bill of materials line, click "Edit" (button with pencil icon).
   e. In the Operations section, **assign operations to the previously created user** (in step 0).
   f. Click "Back" and save the MO.

   If an MO is already saved, if necessary, then you can reassign workers in the Operations section, when you open the MO at "Production planning -> Manufacturing orders".

2. **Log in with the Internet-kiosk user.**

3. **Report production.**
   a. To start an operation, click the "Start" button.
   b. To pause or end, click the "Pause" or "Finish" button.
   c. Report quantity made.
      When the last operation is finished, the MO is automatically finished, booked materials are consumed, and finished products counted to stock.

      If after production the list of consumed materials should be amended, it can be done by the manager by opening the MO details at "Production planning -> Manufacturing orders" and changing the materials and/or quantities.

      If the actual final quantity is different from planned, then the MO quantity should be updated by the manager by opening the MO details at "Production planning -> Manufacturing orders" and changing the quantity of the MO.

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Part 2. Enter own data for testing

2.1. General account settings

Before starting to enter your data, you should go over some general system settings.

Attention! Do not mix test and real data. Clean your database after testing and setup decision. Use our Implementation Guidelines for more information.

2.1.1. Create users for your team

Go to **Settings -> Human resources -> Users** and add users one by one.

At this stage, if you are not sure about which rights to grant each user, you can use the "Copy user's rights" drop-down box to copy rights from previously listed users.

In our examples we will only have one main user - John Smith.

2.1.2. Check the general system settings

There are few default settings that you should go over:

- Check the regional settings at **Settings -> System settings -> Regional settings.**
- Fill in your company information at **Settings -> System settings -> Company details.**
- Enter your business's working hours at **Settings -> System settings -> Working hours.**
- Define holidays at **Settings -> System settings -> Holidays.**
- Check the **Software settings** and **Usability settings**. These may not need changing, but it is good to be aware of the options and current configuration.
- You may check other system settings as well, but at this point do not start customizing your documents, labels, etc. It is not yet the time for it.
- A friendly warning: do not meddle with settings "just in case".
  If you do not understand it, it could be better not to use it. If you wish to know what it does, it is better to read the MRPeasy User Manual.

2.2. Organize and enter your seed data

Manufacturing companies are different, but also similar in many ways. Please find below two generic examples of setting up MRPeasy for two different manufacturing concepts:

- **Discrete manufacturing** is the production of distinct items. Car parts, furniture, toys are examples of discrete goods. The resulting products are easily identifiable. As an example, in this manual we will use wooden tables (*Example 1*).

- **Process manufacturing** is common in the food and beverage, chemical and biotechnology industries. As an example, in this manual we will use ice cream (*Example 2*).

It might be a good idea to go through both - the first example is easier and the second is more complex.

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2.2.1. Example 1 – Discrete manufacturing (Wooden tables)

Step 1. Describe the manufacturing process for your product
The MRPeasy setup process should start with one end-product.

Choose the first product carefully - it should not be your most complex product, but it should be typical for your production. The complexity of the chosen product will largely determine the time required for its setup.

Describe in detail the manufacturing process of your product, including the required materials, processing steps, jobs, and workers. Create a description in any form convenient for you - graphic or step-by-step text. The aim here is not to miss anything significant. The exact costs of materials and labor, as well as required time, on this step are not important, you will specify them later when gather seed data.

The following is a sample of process description in free text form. In example 2 you can find a sample of a graphical representation.

We produce wooden tables:

- Each table consist of 4 legs, 1 tabletop, and needs some varnish for finishing.
- We do not produce the table legs and tops by ourselves, but buy them from a vendor Wood Inc.
- We buy the varnish from a vendor Chemicals ltd.
- The production consists of two operations – assembly in woodworking room and varnishing in painting room.

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Step 2. Describe your stock items - procured items and manufactured items
Describe all the involved parts (SKUs - Stock Keeping Units) and collect their data.

We have 3 procured items:

1. Tabletops
2. Table legs
3. The varnish

We have 1 manufactured item:

1. The assembled and varnished wooden table, our end-product.

Collect the data for our items. The items for our example are shown in the tables below.

Table 1. Data for procured items in table manufacturing example.

Item details					Purchase terms				
Part description	Product group[1]	Unit of Measurement	Default storage location[2]	Reorder point[3]	Vendor	Priority[4]	Lead time[5]	Price per UoM	Min. quantity[6]
Tabletop	Parts	pcs	General	10 pcs	Wood Inc.	10	3 days	5 USD	
Table leg	Parts	pcs	General	40 pcs	Wood Inc.	10	3 days	2 USD	
Varnish	Parts	liter	General	0 pcs	Chemicals Inc.	10	2 days	3 USD	

Table 2. Data for manufactured items.

Item details				
Part description	Product group[1]	Unit of Measurement	Default storage location[2]	Reorder point[3]
Wooden table	Products	pcs	General	0 pcs

[1]**Product groups** - *The product groups are important for the user, when looking up an item from the system. The speed of lookup will depend on how good your product groups' definitions are. Also, different asset accounts may be used for each product group.*

[2]**Default Storage location** - *The storage location assigned by default to these items when these arrive in stock. We use the default location "General", which corresponds to an un-specified location.*

[3]**Reorder point** - *the minimal inventory level of the item when it is needed to make a purchase order or a manufacturing order. Recommended setting at least "0".*

[4]**Priority –** *If your item has more than one vendor, the priority number shows the preferable vendor by default. A higher number in the Priority field indicates higher priority.*

[5]**Lead time -** *Typical lead time in business (not calendar) days for this item and vendor combination.*

[6]**Min. quantity -** *Minimum order quantity (MOQ). Undefined in this example.*

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Step 3. Determine if there are any special requirements for your items' manufacturing

*Go through the <u>Professional functions</u> and <u>Enterprise functions</u> lists in the MRPeasy User Manual and check the functionality you need to use in your processes. **Do not enable any function "just in case".***

For the table manufacturing example, we do not need any of Professional or Enterprise functions.

Step 4. Create vendors for procured items

Enter vendors of your procured items into MRPeasy.

Go to **Procurement -> Vendors** and click "**+**" to create a new vendor "Wood Inc.":

When it is saved, create another vendor "Chemicals Inc." for the varnish.

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Step 5. Create items for procured items and their purchase terms
According to data gathered in step 2, enter procured items into MRPeasy.

Go to **Stock -> Items** and click "**+**" to start creating a new item. For "Tabletop", we fill it as follows:

Note that the "Part No." is automatically filled by the system. If you have your own part numbers, enter these instead manually.

After saving, add the purchasing options of the item in the "**Purchase terms**" section. For the purchase terms of the "Tabletop", we fill the data as follows:

Save and go back. This item is set up.

Next, following the same procedure, create the items for:

- Table leg
- Varnish.

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Step 6. Define production resources - workforce and workstations
List and organize the manufacturing resources – workers and workstations.

Workforce:

1.   John Smith, employee. Labor expenses are 20 per hour.

Workstations groups and workstations*:

1.   The assembly of tables happens in a woodworking shop.
     - There are three identical workstations.
     - The workstation group is called "Woodworks".
2.   The varnishing of tables happens in the painting room.
     - The workstation group is called "Paint room".

*) A workstation group is a group of workstations that can all do the same task. Workstation groups together with workstations define your production capacity.

Step 7. Set the hourly wage and access permissions for employees
Set up users for employees, according to step 6, and define the hourly labor cost.

In our simplified example, we do not have separate users for line workers. Usually, for such users, the access should be allowed to either "My production plan" or "Internet kiosk" only.

In our example, employee John Smith is the main user.

Go to **Settings -> Human resources -> Users** and define the "Hourly wage" value in **User details** as 20.

Step 8. Create workstation groups and workstations
Define your workstation groups in MRPeasy, according to step 6.

Go to **Production planning -> Workstations groups** and first create the workstation group for "Woodworks". Choose to automatically create 3 instances.

Once this is saved, create the "Paint room" workstation group with 1 instance.

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Step 9. Create stock items for manufactured products, bills of material (BOM), and routings

Enter the manufactured product into the system by creating the item, according to step 2, and defining its BOM and routing.

Go to **Stock -> Items** and click "**+**" to create a new item "Wooden table" as shown below.

Note, that "This is a procured item" box is unchecked.

After saving, we scroll to the "**BOM**" section in the item details view and create a BOM.

One table consist of 1 tabletop, 4 table legs and uses 0.5 l of varnish.

Save and go back to the item's details page. In the "**Routing**" section create a new routing.
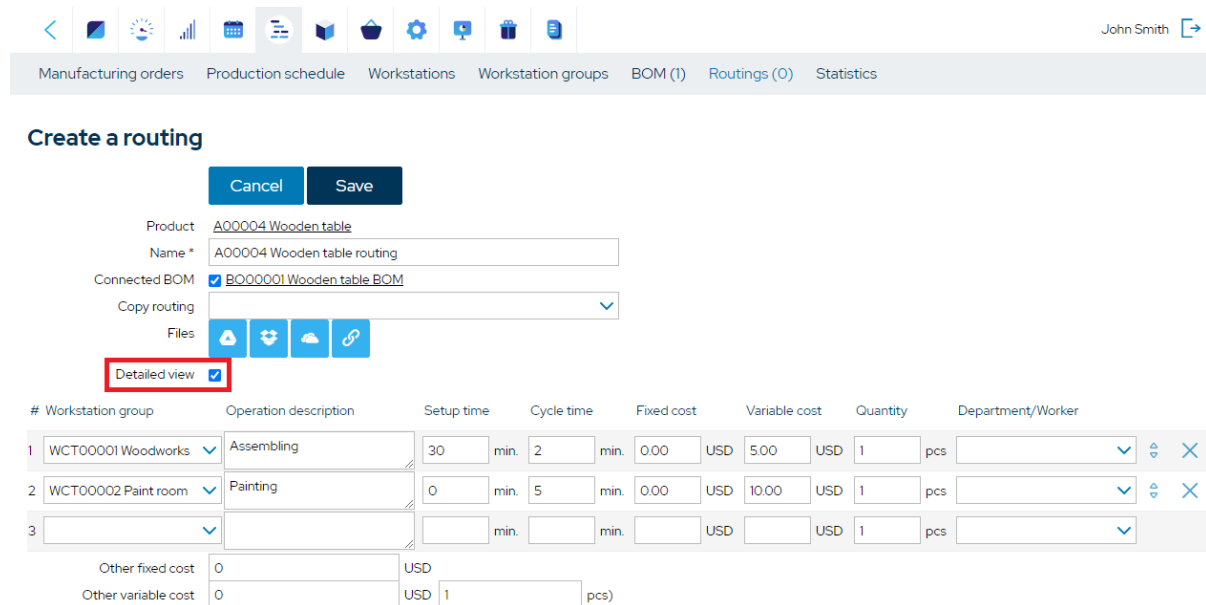
We must execute two technological operations for manufacturing the table:

1. Assembly of table's parts:
   - We need 30 min setup time to prepare the workspace.
   - We need 2 min for assembling one table.
   - The variable cost (cost for assembling one table) is 5.

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2. Varnishing:
   - We spend 5 min for varnishing one table.
   - The variable cost of this operation is 10.

Additionally, we have other variable cost (indirect manufacturing expenses, for example) 1 per table.

The routing is defined as follows:

Note that **Detailed view** box is checked, because we want to define fixed and variable costs; otherwise we could use the basic view.

Save it and go back to the item details view. Now the "Wooden table" is fully defined.

Step 10. Create test Purchase Orders (PO) for materials
In this step, check if vendors, prices, and lead times for materials were defined correctly.

Currently the inventory is empty. Create Purchase Orders for materials for 100 wooden tables:

- 400 table legs from Wood Inc.
- 100 tabletops from Wood Inc.
- 50 liters of varnish from Chemicals Inc.

Go to **Procurement -> Purchase orders** and create the Purchase Order for Wood Inc for table legs and tabletops.

Check that the vendor and price are right, and the PO **"Expected date"** is calculated correctly according to the lead time of materials.

As this is a test, skip all other PO management steps and mark it received immediately by entering the **"Arrival date"** and saving. (If you have software setting "Several invoices per PO = YES", you must enter a purchase invoice instead for PO receipt.)

We create another PO to repeat the above with vendor Chemicals Inc. for procuring 50 l of varnish.

Step 11. Create test Manufacturing Orders (MO) for products
In this step, check if you are getting the expected results when scheduling production.

Go to **Production planning -> Manufacturing orders** and click "**+**" to create a new MO for 100 tables.

Check that the calculated quantity of materials, operation durations, start and finish times, labor costs, overhead costs, cost per 1 unit, etc. are as expected.

Everything is as expected.

Step 12. Test thoroughly and implement changes
Now that the seed data is in place, test thoroughly all the functionality and usage scenarios.

Make sure that the seed data is defined and entered correctly, according to the logic of MRPeasy. The goal is to get expected results. *It is possible that some changes may need to be made in your seed data.*

Model a real customer's order and the whole fulfilment processes and play it through: customer order entry, production planning process, procurement process, shop-floor reporting (in "My production plan" or "Internet-kiosk"), picking and shipping, etc.

MRPeasy

2.2.2. Example 2 – Process manufacturing (Ice cream)

Step 1. Describe the manufacturing process for your product
Start MRPeasy setup process with one end-product.

Choose the first product carefully - it should be not the most complex product, but it should be typical for your production. The complexity of the chosen product will largely determine the time required for its setup.

Describe in detail the manufacturing of your product, including the required materials, processing steps, jobs, and workers. Create a description in any form convenient for you - graphic or step-by-step text. The aim here is not to miss anything significant. The exact costs of materials and labor, as well as required time, at this step are not important, specify them later when fill seed data.

For presenting a simplified ice cream manufacturing process let use the Business Process Modeling (BPM) notation – a graphic form for description the business process.
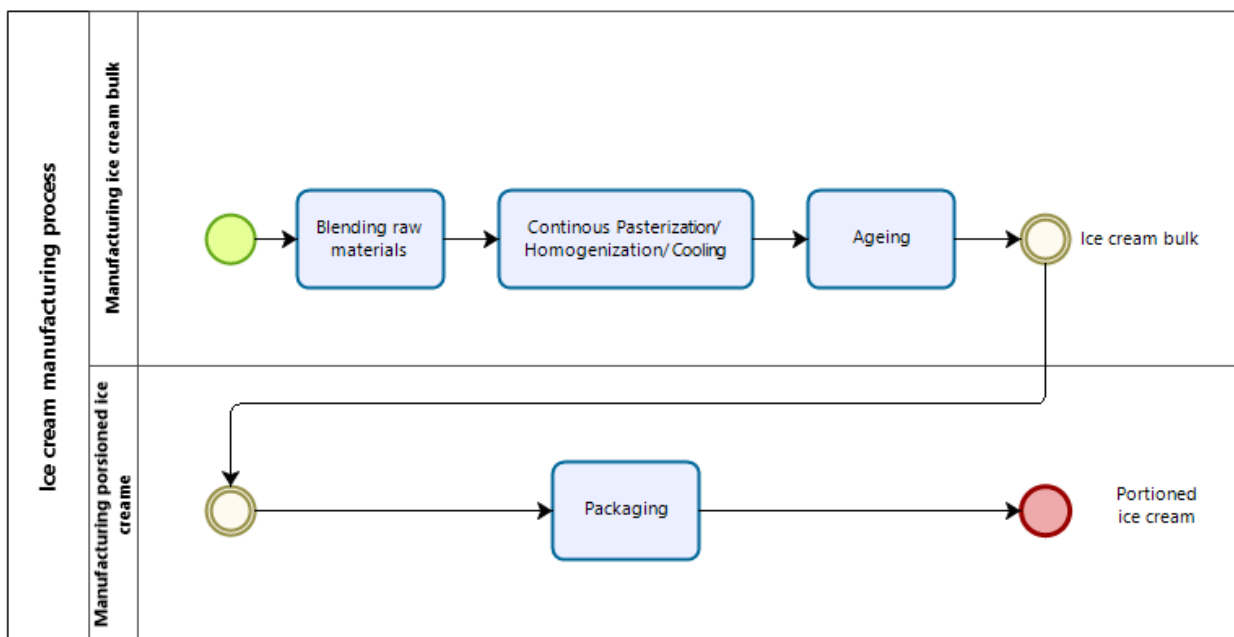
It is important to understand here, that we have two, not one, manufactured products – the ice cream bulk, a half-product, which can be kept on stock and used as a raw material for other products; and a packaged portion of ice cream, an end-product.

MRPeasy

Step 2. Describe your stock items - procured items and manufactured items
Describe all the involved stock items (Stock Keeping Units - SKUs) and collect their data.

We have 4 procured items:

1.   Milk
2.   Heavy cream
3.   A readymade mix of different fats and flavors
4.   The packaging material for ice cream portions

We have 2 manufactured items:

1.   The ice cream bulk
2.   The portioned (packaged) ice cream

We collect the seed data for creating items. It is shown in the tables below.

Table 3. Data for procured items in ice cream manufacturing example.

| Item details | | | | | Purchase terms | | | | | | |
Part description	Product group[1]	Unit	Default storage location[2]	Reorder point[3]	Vendor	Priority[4]	Lead time[5]	Price per UoM	Vendor-specific UoM[6]	Conversion rate	Min. quantity[7]
Milk 2,5%	Ingredients	liter	Chilled	20 liters	Milk Farm Inc.	10	1 day	0.25 USD			20 liters
Heavy cream 35%	Ingredients	liter	Chilled	10 liters	Milk Farm Inc.	10	1 day	1.50 USD			10 liters
Readymade Dry Mix	Ingredients	kg	Chilled	0 kg	Dry Mix Co	10	3 days	100 USD	Bag (50 lbs.)	1 bag = 22.68 kg	1 bag
Ice Cream packaging	Packaging	pcs	General	400 pcs	Packaging Solutions Inc.	10	3 days	0.05 USD			400 pcs

Table 4. Data for manufactured items.

| Item details | | | | |
Part description	Product group[1]	Unit	Default storage location[2]	Reorder point[3]
Ice Cream bulk	Half-products	liter	Frozen	80 liters
Ice Cream 200 ml package	Finished products	pcs	Frozen	0 pcs

[1]**Product groups** - *Product groups are important for the user, when looking up an item from the system. The speed of lookup will depend on how good your product group' definitions are. Also, different asset accounts may be used for each product group.*

[2]**Default Storage location** - *The storage location assigned by default to these items when they arrive in stock.*

[3]**Reorder point** - *the minimal inventory level of the item when it is needed to make a purchase order or a manufacturing order. Recommended setting at least "0", but generally higher.*

[4]**Priority –** *If your item has more than one vendor, the priority number shows the preferable vendor. A higher number in the Priority field indicates higher priority.*

[5]**Lead time -** *Typical lead time in business days for this item from this vendor.*

[6] *We have a **Vendor-specific unit of measurement** for "Readymade Dry Mix", because vendor sells the mix in 50 lbs. bags. The price 100 USD is for 1 bag. Conversion rate is 22.68 kg = 50 lbs. = 1 bag.*

[7]**Min. quantity -** *Minimum order quantity (MOQ).*

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Step 3. Determine if there are any special requirements for your items
Go through the <u>*Professional functions*</u> *and* <u>*Enterprise functions*</u> *lists in the MRPeasy User Manual and check the functionality you need to use in your processes.* **Do not enable any function "just in case".**

Potentially, the following specific functionality can be useful for this example:

- <u>Expiry Date</u> functionality.
- <u>Matrix BOM</u> - if you have a great number of packages shared over different product lines, you might want to use Matrix BOM (BOM with parameters) for this.
- <u>Fixed Quantity</u> - when for example just one pair of gloves is used in one production run, unrelated to the amount produced, then add the gloves to BOM with a Fixed Quantity.

For your first product we do not recommend using these features.

Nevertheless, there is one functionality, which can be used for manufacturing operations, which are longer than 8 hours and do not need employee presence all the time. In our example, the ice cream bulk ageing time varies between 24 and 96 hours, and worker assistance is needed only on beginning and end of the process. In this case, we can choose for this operation <u>Piece payment</u> instead of using workers hourly wage.

Go to **Settings -> System settings -> Professional functions -> Piece payments -> Yes**. This will give ability to configure in the routing worker's payment per piece of product.

MRPeasy

Step 4. Create vendors for procured items
Enter the vendors of your procured items into MRPeasy.

Go to **Procurement -> Vendors** and click "**+**" to start creating a new vendor "Dry Mix Co.":

When it is saved, create other vendors "Milk Farm Inc." and "Packaging Solutions Inc." for the rest of the procured items.

Step 5. Create items for procured items and their purchase terms
According to data gathered in step 2, enter the procured items into MRPeasy.

Go to **Stock -> Items** and click "**+**" to start creating a new item.

For "Readymade Dry Mix" we fill it as follows:

Note that the "Part No." is automatically filled by the system. If you have your own part numbers, enter them instead manually.

After saving, add the purchasing options of the item in the "**Purchase terms**" section.

For the purchase term of the "Readymade Dry Mix", fill the data as follows:

MRPeasy

Add a vendor for A00001 Readymade Dry Mix

Cancel	Save

Product	A00001 Readymade Dry Mix
Vendor *	V00001 Dry Mix Co.
Vendor part no.	
Priority	10
Lead time *	3 days
Price per UoM *	100.00 USD
Min. quantity	1 bag
Vendor-specific unit of measurement	☑ Yes
Vendor's UoM	bag
Indivisible UoM	☑ Yes
Conversion rate	22.68 kg = 1 bag
Files	

Cancel	Save

Save and go back. This item is set up.

Next, following the same procedure, create the items for:

- Milk
- Heavy cream
- Ice cream packaging

MRPeasy

Step 6. Define production resources - workforce and workstations

List and organize the manufacturing resources – workers and workstations.

Labor:

1. John Smith, worker. Workforce expense is 20 per hour.

Workstations groups and workstations*****:

1. The blending of liquid and dry raw materials takes place in the blender.
   - We have 1 blender with a capacity of 80 litres.
   - The workstation group is "Blender".
2. Continuous pasteurization (CP), homogenization (H), and cooling (C) happen in the machine we call "CPHC".
   - We have 1 CPHC machine with a capacity of 80 litres.
   - The workstation group is "CPHC".
   - Works in a 24/7 regime.
3. The ice cream mass will be ageing in a fixed volume container.
   - We have 1 container.
   - The workstation group is "Ageing station".
   - Works in a 24/7 regime.
4. The ice cream portioning and packaging is done with a packaging machine.
   - We have 1 machine.
   - The workstation group is "Packaging machine".

If we know how many hours the workstation works during the year and how big is its amortization, then we could calculate the hourly manufacturing overhead rate for this workstation.

Assume, that for our example the hourly rates for our workstations are as follow:

- Blender – 0.2 USD per hour.
- CPHC – 1.5 USD per hour.
- Ageing station – 0.8 USD per hour.
- Packaging machine – 1.0 USD per hour.

*) A workstation group is a group of workstations that can all do the same tasks. Workstation groups together with workstations define your production capacity.

MRPeasy

Step 7. Set the hourly wage and access permissions for employees
Set up users for the employees, according to step 6, and define the hourly rates.

In our simplified example, we do not have separate users for line workers. Usually, for such users, the access should be allowed to either "My production plan" or "Internet kiosk" only.

In this example, our employee John Smith is our main user.

Go to **Settings -> Human resources -> Users** and define the "Hourly wage" value in **User details** as 20.

Step 8. Create workstation groups and workstations
Define workstation groups according to step 6.

Note, that the CPHC and ageing station workstations work 24/7, because the operation's duration for them vary from 24 to 96 hours, depending on the type of ice cream.

Go to **Production planning -> Workstations groups** and create a new group.

(Note, that once filled in workstation group's view, the hourly rate can be seen and edited later only in each workstation's details view.)

Next, in a similar manner, create other workstation groups and workstations for:

- Blending – no custom hours.
- Ageing – custom hours 24/7.
- Packaging – no custom hours.

MRPeasy

Step 9. Create stock items for manufactured products, bills of material (BOM), and routings

Enter manufactured products into the system by creating stock items and defining their BOMs and routings.

I. Create the "Ice cream bulk" item, BOM, and routing.

Go to **Stock -> Items** and click "**+**" to create a new item.

(Note, that "This is a procured item" box is unchecked.)

After saving, scroll to the "**BOM**" section in the "Ice cream bulk" item details view and create a new BOM.

One litre of ice cream bulk consists of 0.5 litre of milk, 0.3 litre of cream and 0.2 kg dry mix.

Note, that a BOM always corresponds to 1 UoM of manufactured product.

Next, go back to the item details page and continue with adding the routing in the "**Routings**" section.

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Three operations are needed for manufacturing the ice cream bulk:

1. Blending of raw materials:
    - 5 minutes setup time for preparing the blender.
    - 15 minutes for blending up to 80 liters per run.
2. Continuous pasteurization, homogenization, and cooling process:
    - 30 minutes setup time for preparing.
    - 360 minutes (6 h) for start-to-end process, up to 80 litres per run.
    - Worker's assistance is needed only for setup time and at the end of the operation, what makes 15 USD of labor cost per run. For this, we must use the piece payment functionality and disable hourly payment. So, with one run capacity of 80 litres we will use 15/80 = 0.1875 USD (per 1 litre) as the "Piece-payment" value.
3. Ice cream bulk ageing:
    - 1440 minute (24 h) for processing the 80 litres per run.
    - Worker's assistance is needed only at the end of the operation, what makes 10 USD per run. For this, we must use the piece payment functionality and disable hourly payment. We will use 10/80 = 0.125 USD (per 1 litre) as the Piece-payment value.

We define the routing as follows:

Note, that the field **Quantity** in this view defines the number of products that can be processed simultaneously within the "Cycle time" (the default value is 1). The value 80 correspond to the maximum capacity that can be processed within the "Cycle time".

Save it and go back to item details view. Now the "Ice cream bulk" is set.

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II. Create the "Ice cream in 200 ml package" item, BOM, and routing.

Go to **Stock -> Items** and create a new item.

After saving, go to the **BOM** part in the item details view and create a new BOM.

One portion of packaged ice cream consist of 0.2 litres of ice cream bulk and 1 package.

Next, go back to the item details page and continue with adding a routing in the "**Routings**" section.

There is one technological operation for manufacturing the portioned ice cream:

1. Packaging:
   - 12 minutes setup time for preparing the equipment.
   - 0.05 minutes cycle time for packaging 1 portion.

MRPeasy

We define the routing as follows:

Save it and go back to item details view. Now the "Ice cream in 200 ml package" is entered.

Step 10. Create test Purchase Orders (PO) for materials
In this step, check if vendors, prices, and lead times for materials are defined correctly.

Currently the inventory is empty. Create POs for ingredients and packaging for 400 portions of ice cream. For that, the following is needed:

2. 40 litres of milk from Milk Farm Inc.
3. 24 litres of heavy cream from Milk Farm Inc.
4. 16 kg of dry mix from Dry Mix Co.
5. 400 packages from Packaging solutions Inc.

Go to **Procurement -> Purchase orders** and create new PO for Milk Farm Inc. for milk and heavy cream.

Check that the vendor and price are right, and the PO "**Expected date**" is calculated correctly according to the lead time of materials.

Create other POs to repeat the above with vendors Packaging Solutions Inc. and Dry mix Co. for procuring the packages and dry mix.

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Step 11. Create test Manufacturing Orders (MO)
In this step, check if you receive expected results when scheduling production.

I. Create the MO for ice cream bulk.

Go to **Production planning -> Manufacturing orders** and create a new MO for 80 litres of bulk ice cream.

Check that the calculated quantity of materials, operation durations, start and finish times, labor costs, overhead costs, cost per 1 unit, etc. are as expected.

Manufacturing orders   Production schedule   Workstations   Workstation groups   BOM (2)   Routings (2)   Statistics

Manufacturing order MO00001

Back	Save	Delete

PDF wide ↓   PDF medium ↓   PDF narrow ↓

Field	Value		Field	Value	
Number *	MO00001		Created *	03.11.2020	
Product group	AG00002 Half-products		Status	Scheduled	
Product	A00005 Ice cream bulk		Start	10.11.2020 08:00	
Files			Finish	11.11.2020 14:51	
Quantity *	80	liter	Total cost	177.23	USD
Due date			Cost per 1 liter	2.22	USD
Assigned to *	John Smith		Cost of materials	116.55	USD
Target lot	L00005		Applied overhead cost	29.02	USD
Customer orders			Labor cost	31.67	USD

Parts

| Book all parts | Release all booked parts |

Stock item	Consumed	Booked	Total cost	Cost per unit	Lot	Status	Storage location	Available from	
A00003 Milk 2,5%	0 liter	40 liter	USD 10.00	USD 0.25					+
	0 liter	40 liter	USD 10.00	USD 0.25	L00001	Requested	Chilled	04.11.2020	↩
A00002 Heavy cream 35%	0 liter	24 liter	USD 36.00	USD 1.50					+
	0 liter	24 liter	USD 36.00	USD 1.50	L00002	Requested	Chilled	04.11.2020	↩
A00001 Readymade Dry Mix	0 kg	16 kg	USD 70.55	USD 4.41					+
	0 kg	16 kg	USD 70.55	USD 4.41	L00003	Requested	Chilled	09.11.2020	↩

Operations

Operation	Workstation	Planned start	Planned finish	Applied overhead cost	Worker	Actual start	Actual finish	Quantity	Labor cost	
Blending the raw materials	C00001 Blender (1)	10.11.2020 08:00	10.11.2020 08:20	USD 0.0666666667	Joe Worker				USD 6.67	✎
Pasteurization / Homogenization / Cooling	WCT00001-1 CPHC (1)	10.11.2020 08:20	10.11.2020 14:50	USD 9.75	Joe Worker				USD 15.00	✎
Ageing	WCT00005-1 Ageing station (1)	10.11.2020 14:50	11.11.2020 14:51	USD 19.20	Joe Worker				USD 10.00	✎

II. Create the MO for packaged ice cream.

Next, make a MO for packaged ice cream and check it:

Everything is as expected. We see that this MO is using the ice cream bulk, which was planned previously.

Step 12. Test thoroughly and implement changes
Now that the seed data is in place, test thoroughly all the functionality and usage scenarios.

Make sure that the seed data is defined and entered correctly, according to the logic of MRPeasy. The goal is to get expected results.

Model a real customer's order and the whole fulfilment processes and play it through: customer order entry, production planning process, procurement process, shop-floor reporting (in "My production plan" or "Internet-kiosk"), picking the goods at stock and shipping, etc.

MRPeasy