User Manual (English)

The following are the various modules and domains offered by ERP+ from Technocom, covering a wide range of businesses. You can be a small distributor, a manufacturer, running an educational institute, or a healthcare organization. There is something for everyone.

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Document Version: 01.01.2019
Release Date: April 25, 2019

Module: Manufacturing

Module: Manufacturing

The Manufacturing module in ERP+ covers all necessary features a Manufacturing business would need. There are options to take a work order, enter stock of items, create a Production Plan, manage Bill of Materials, generate reports, and more.

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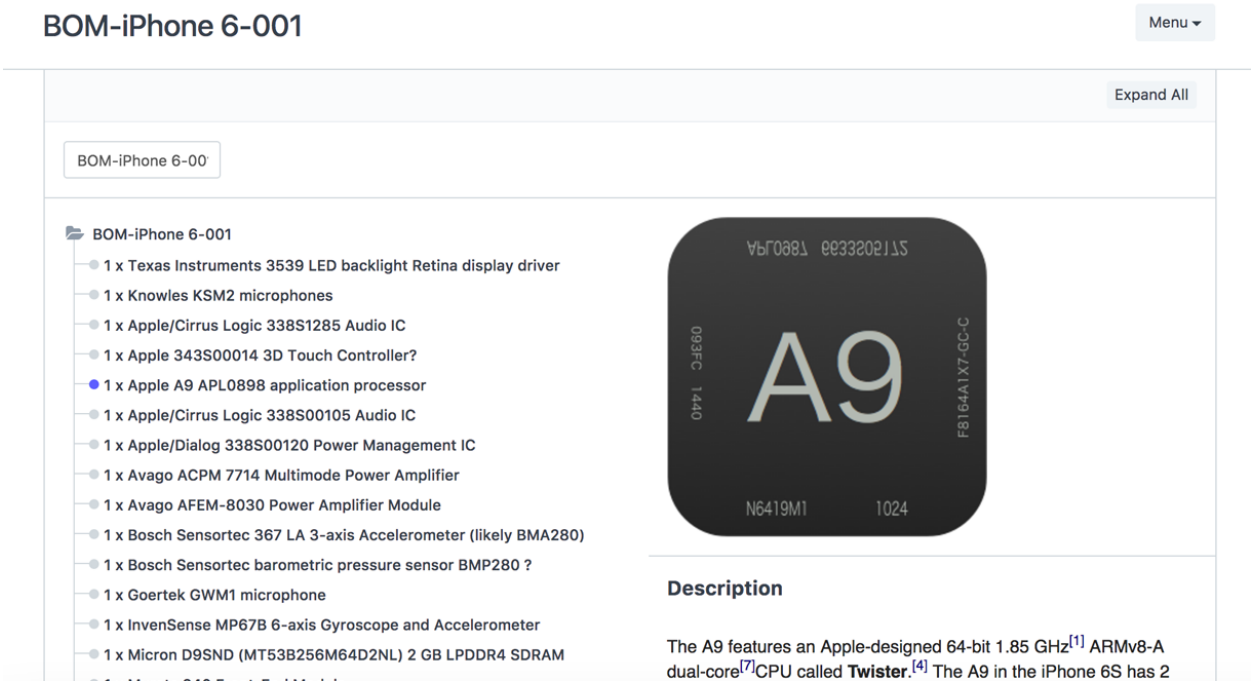
1.1 Topic: Basics and Setup

1. Introduction
2. Manufacturing Settings

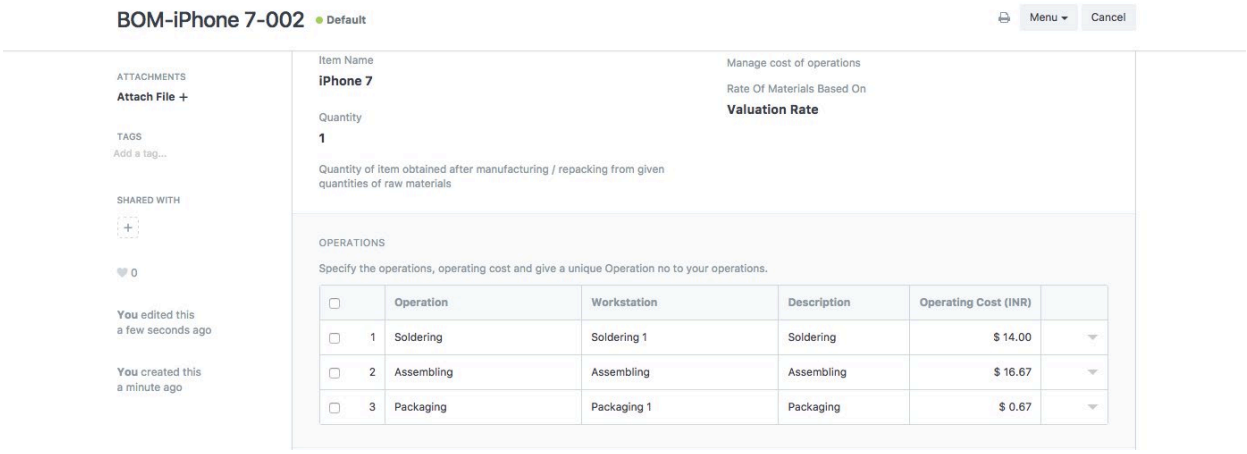
1. Introduction

ERP+ comes batteries included for all requirements of a manufacturing business like Bill of Materials tracking, Production Order planning and execution, procurement and lot more.



Bill of Material, Production Order and More

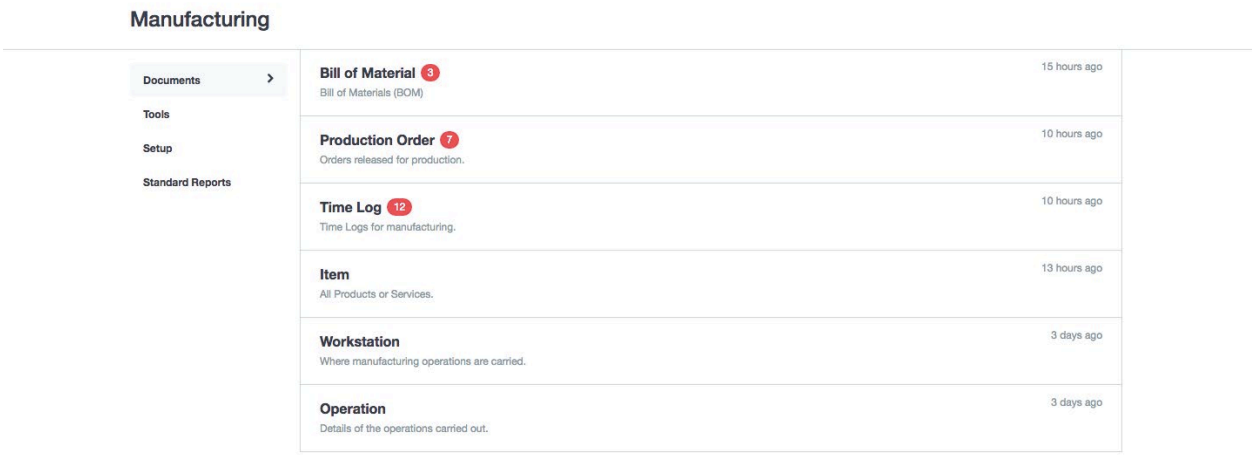
The Manufacturing module in ERP+ helps you to maintain multi-level Bill of Materials (BOMs) for your Items. It helps in product costing, production planning, creating work orders for your manufacturing shop floors and planning inventory by getting your material requirement via BOMs (also called Material Requirements Planning MRP).



You can also effectively track operations like:

- Production Orders against customer's Sales Order
- Material Planning
- Purchasing based on Material Planning a reorder level
- Track actual material transfer against a Production Order
- Dispatched manufactured items to the Customers
- View reports

ERP+ Manufacturing



Types of Production Planning

Broadly there are three types of Production Planning Systems

- **Make-to-Stock:** In these systems, production is planned based on a forecast and the Items are then sold to distributors or customers. All fast-moving consumer goods that are sold in retail shops like soaps, packaged water etc. and electronics like phones etc. are Made-to-Stock.
- **Make-to-Order:** In these systems, manufacturing takes place after a firm order is placed by a customer.
- **Engineer-to-Order:** In this case each sale is a separate project and has to be designed and engineered to the requirements of the customer. Common examples of this are any custom business-like furniture, machine tools, specialty devices, metal fabrication etc.

Most small and medium sized manufacturing businesses are based on a make-to- order or engineer-to-order system and so is ERP+.

For engineer-to-order systems, the Manufacturing module should be used along with the Project module.

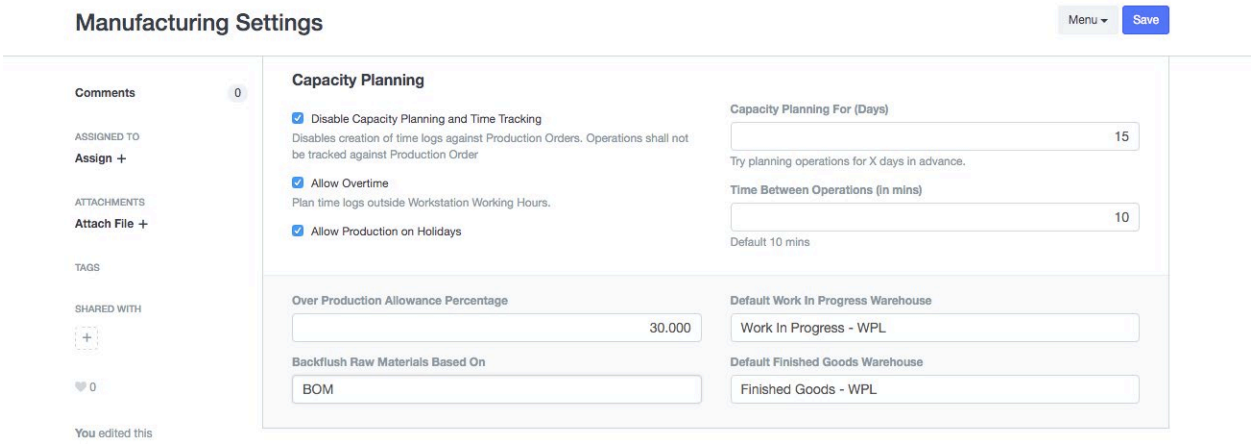
Manufacturing and Inventory

You can track work-in-progress by creating work-in-progress Warehouses.

ERP+ will help you track material movement by automatically creating Stock Entries from your Work Orders by building from Bill of Materials.

2. Manufacturing Settings

Manufacturing Settings can be found at: Manufacturing > Setup > Manufacturing Settings



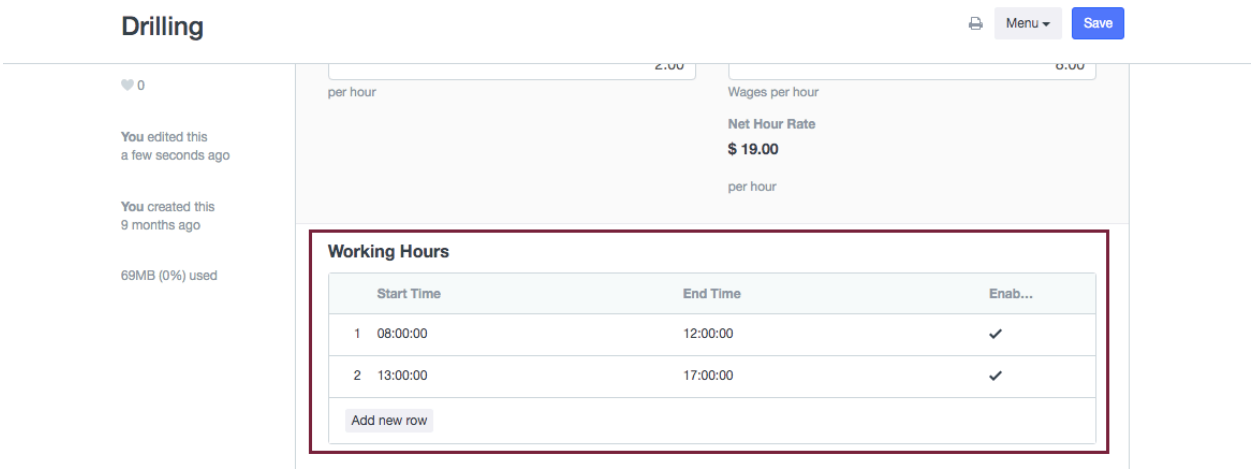
Disable Capacity Planning and Time Tracking

As per Capacity Planning feature, when Work Order is created for an item, for each Operation, Time Log is created. Based on actual Operation Time, Time Logs is updated. This also provides total Operations Cost against Work Order.

If you don't track actual operations time, and want to disable creation of Time Log based on Operations, you should check "Disable Capacity Planning and Time Tracking" in the Manufacturing Settings.

Allow Overtime

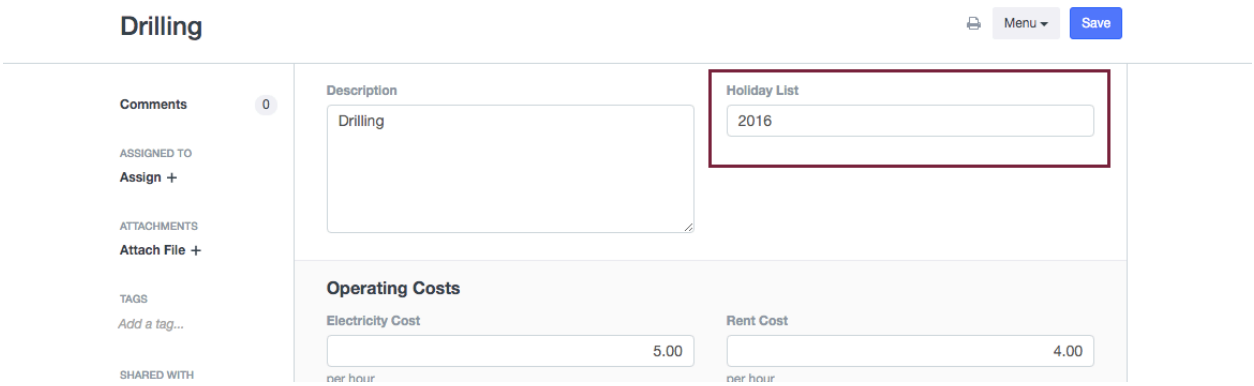
In the Workstation master, actual working hours are defined (say 101m to 6pm). As per the Capacity Planning, Time Logs are created against Workstation, for tracking actual operations hour. It also considers working hours of a Workstation when scheduling job (via Time Log).



As per the standard validation, if Operation cannot be completed within working hours of Workstation, then user is asked to divide an Operation into multiple and smaller Operations. However, if Allow Overtime field is checked, while creating Time Logs for Operation, working hours of Workstation will not be validated. In this case, Time Logs for Operation will be created beyond working hours of Workstation as well.

Allow Production on Holidays

Holiday of a company can be recorded in the Holiday List master. While scheduling production job on workstation, system doesn't consider a day listed in the Holiday list. If you want production job to be scheduled on holidays as well, Allow Production on Holidays field should be checked.

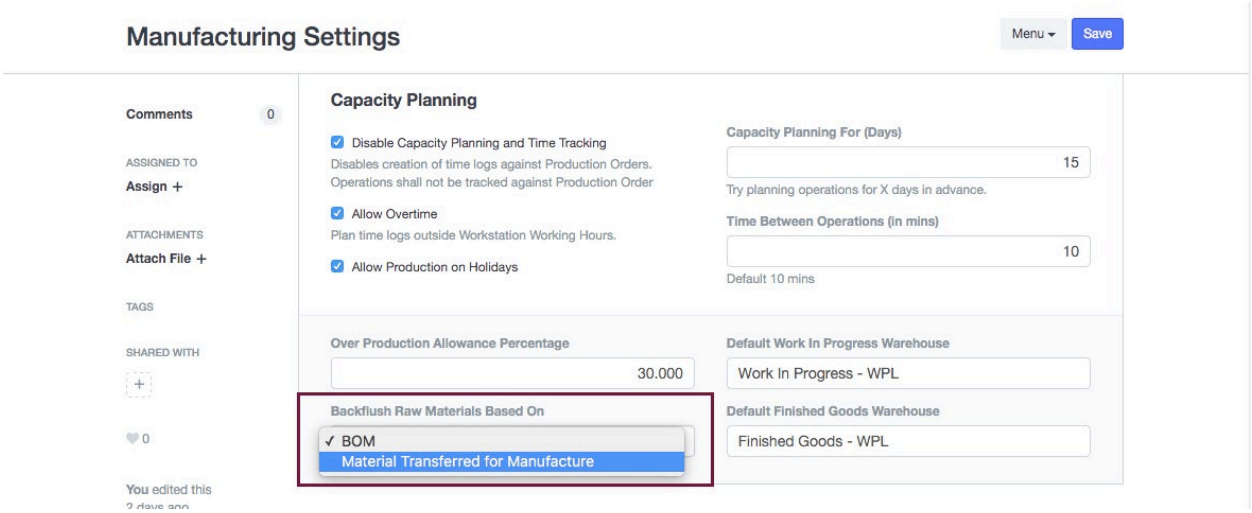


Over Production Allowance Percentage

While making Work Orders against a Sales Order, the system will only allow production item quantity to be lesser than or equal to the quantity in the Sales Order. In case you wish to allow Work Orders to be raised with greater quantity, you can mention the Over Production Allowance Percentage here.

Back-flush Raw Materials Based On

When creating Manufacture Entry, raw-material items are back-flush based on BOM of production item. If you want raw-material items to be back-flushed based on Material Transfer entry made against that Work Order instead, then you should set Back-flush Raw Materials Based On "Material Transferred for Manufacture".



Capacity Planning For (Days)
Define no. of days for which system will do production job allocation in advance.

Time Between Operations (in mins)
Time gap between two production operations.

Default Work in Progress Warehouse
This Warehouse will be auto-updated in the Work in Progress Warehouse field of Work Order.

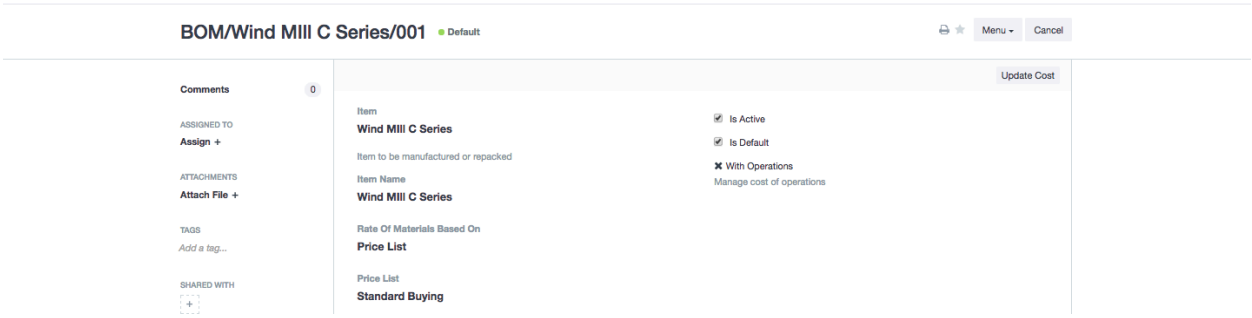
Default Finished Goods Warehouse
This Warehouse will be auto-updated in the Work in Progress Warehouse field of Work Order.

1.2 Topic: Bill of Materials (BoM)

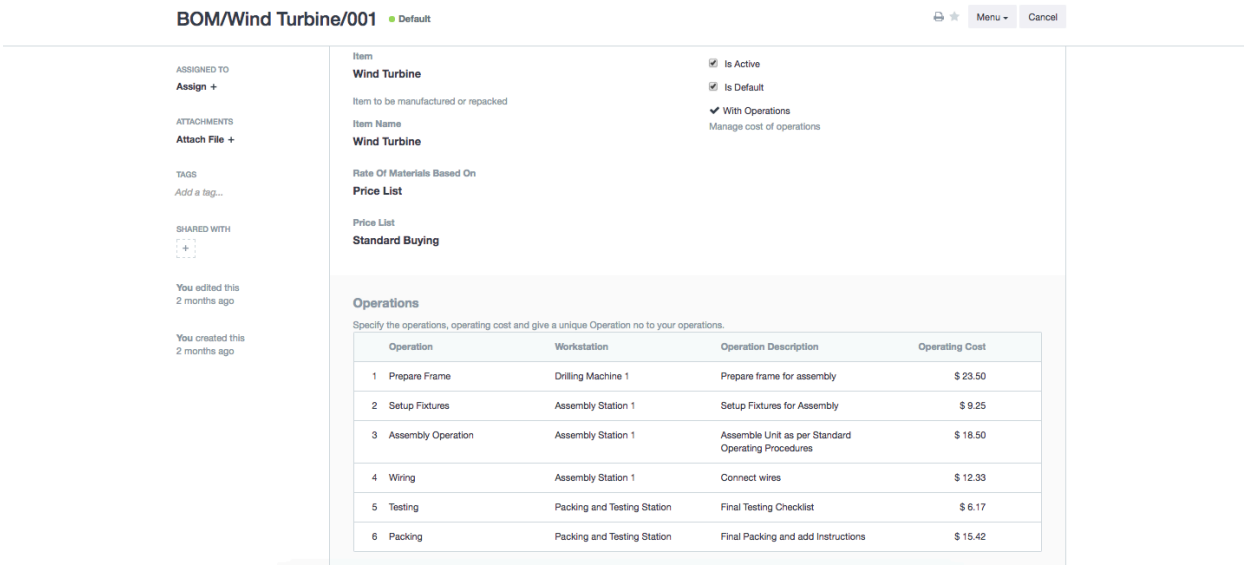
1. Bill of Materials (BoM)
2. Workstation
3. Operation

1. Bill of Materials

At the heart of the Manufacturing system is the **Bill of Materials** (BOM). The **BOM** is a list of all materials (either bought or made) and operations that go into a finished product or sub-Item. In ERP+, the component could have its own BOM hence forming a tree of Items with multiple levels. To make accurate Purchase Requests, you must always maintain correct BOMs. To make a new BOM: Manufacturing > Bill of Materials > New BOM



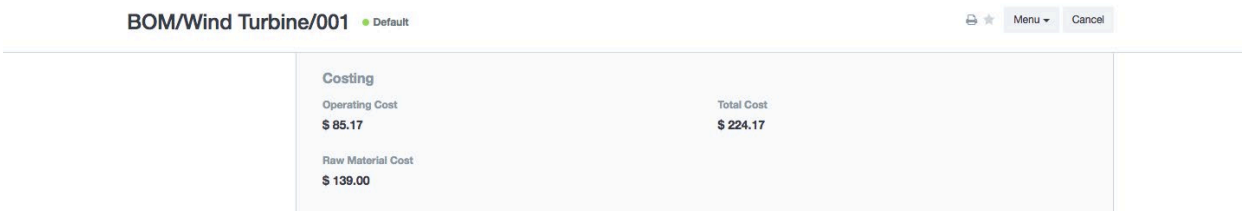
- To add Operations, select 'With Operation'. The Operations table shall appear.



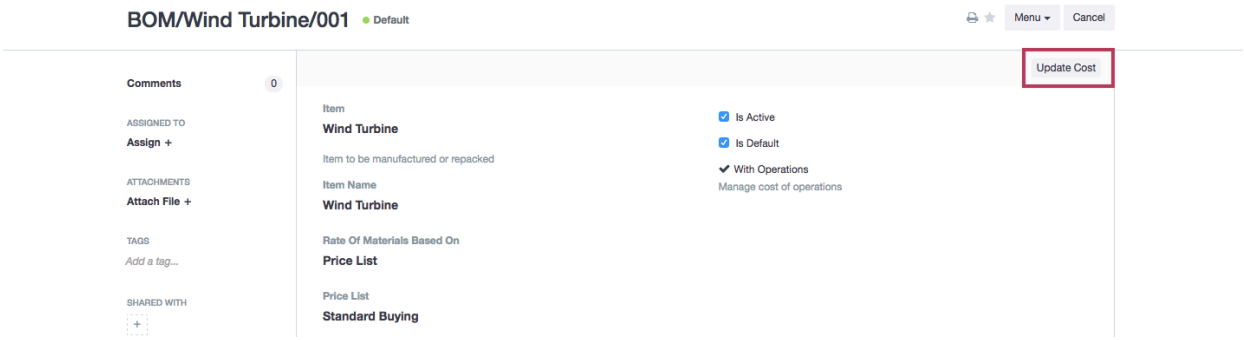
- Select the Item for which you want to make the BOM.
- Check 'Inspection Required' to make the 'Quality Inspection' mandatory for raw materials and the finished goods.
- Add the operations that you have to go through to make that particular Item in the “Operations” table. For each operation, you will be asked to enter a Workstation. You must create new Workstations as and when necessary.
- Workstations are defined only for product costing and Work Order Operations scheduling purposes not inventory.
- Inventory is tracked in Warehouses not Workstations.

Costing of a BOM

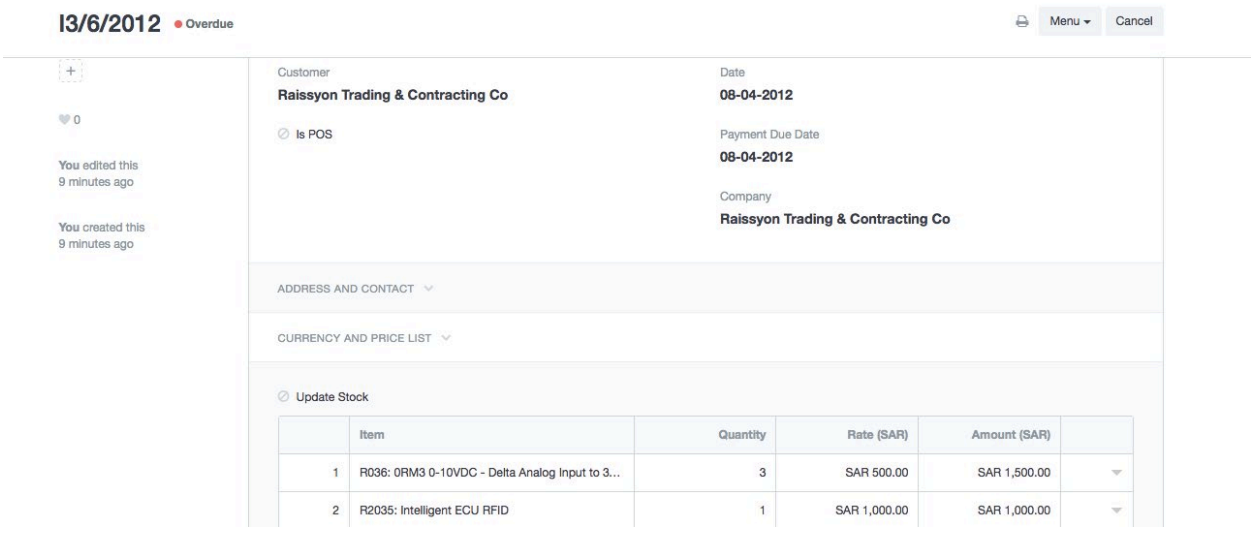
- The Costing section in BOM gives an approximate cost of producing the Item.
- Add the list of Items you require for each operation, with its quantity. This Item could be a purchased Item or a sub-assembly with its own BOM. If the row Item is a manufactured Item and has multiple BOMs, select the appropriate BOM. You can also define if a part of the Item goes into scrap.



- This cost can be updated on by using the 'Update Cost' button.

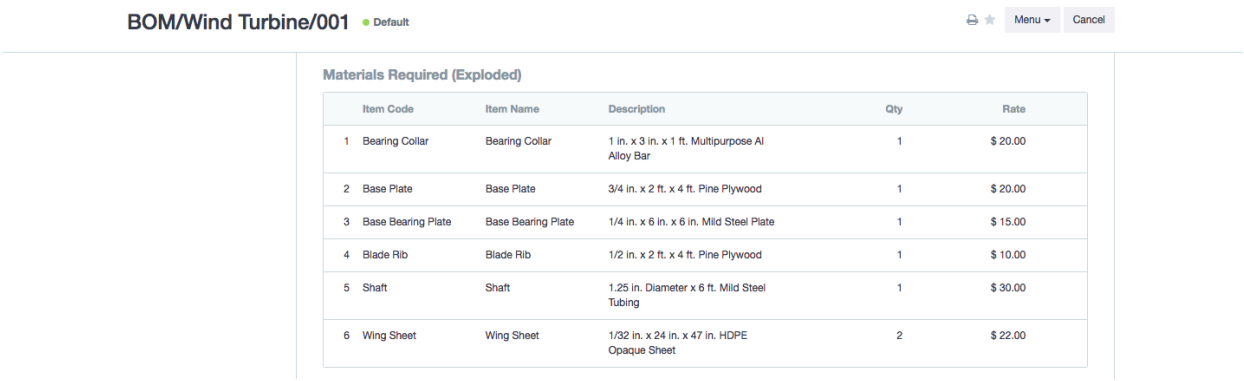


- User can select the currency in the BOM
- System calculates the costing based on the price list currency



Materials Required (exploded)

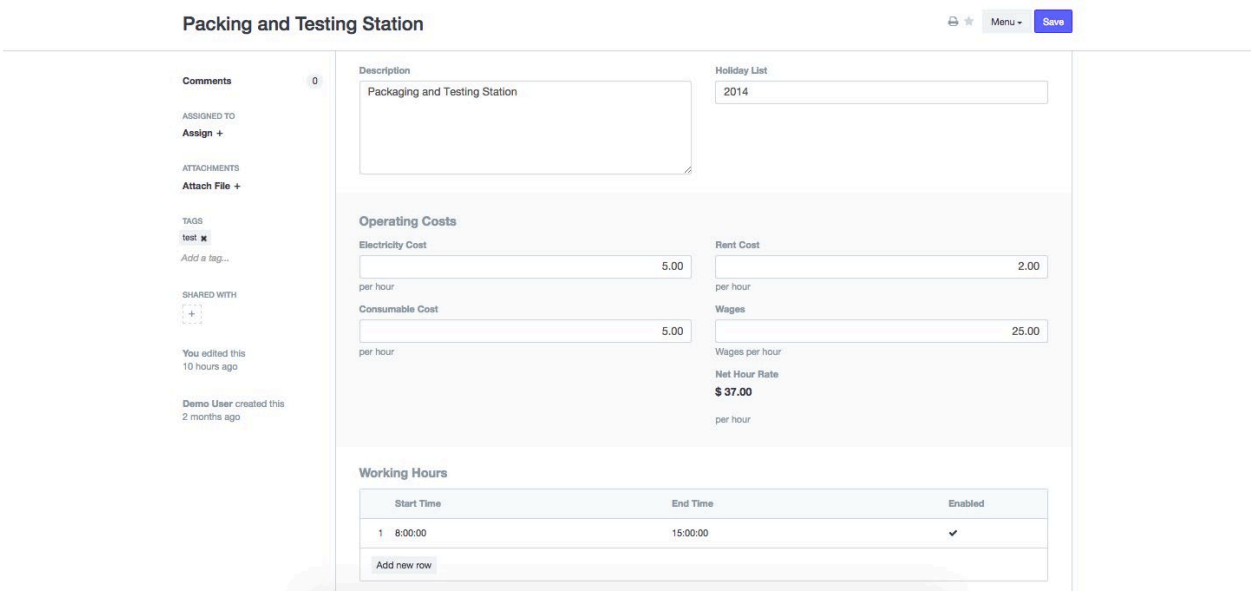
This table lists down all the Material required for the Item to be Manufactured. It also fetches sub-assemblies along with the quantity.



2. Workstation

Workstation stores information regarding the place where the workstation operations is carried out. Data regarding the operation cost of the place can be stored here. We can also specify the workstation operation timings and a Holiday List.

You can also create a Workstation by: Manufacturing > Documents > Workstation > New



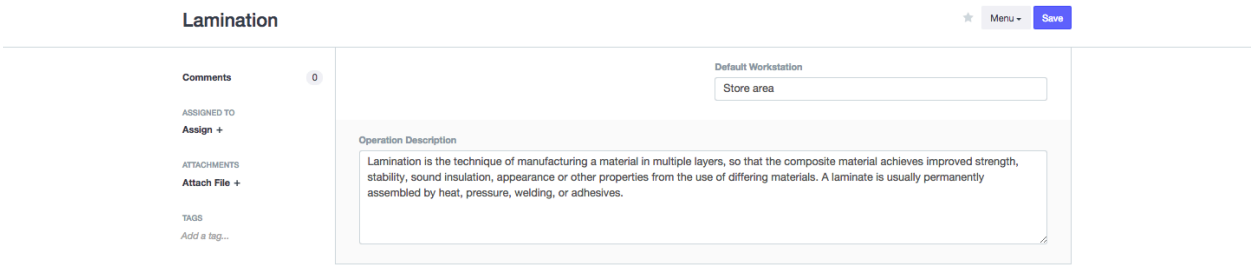
In workstation specify the workstation working hours under the 'working hour' section. You can also specify the working hours based on shifts. While scheduling Work Order, system will check for the availability of the workstation based on the working hours specified.

Note: You can enable overtime for your workstation in Manufacturing Settings

3. Operation

Stores a list of all Manufacturing Operations, its description and the Default Workstation for the Operation.

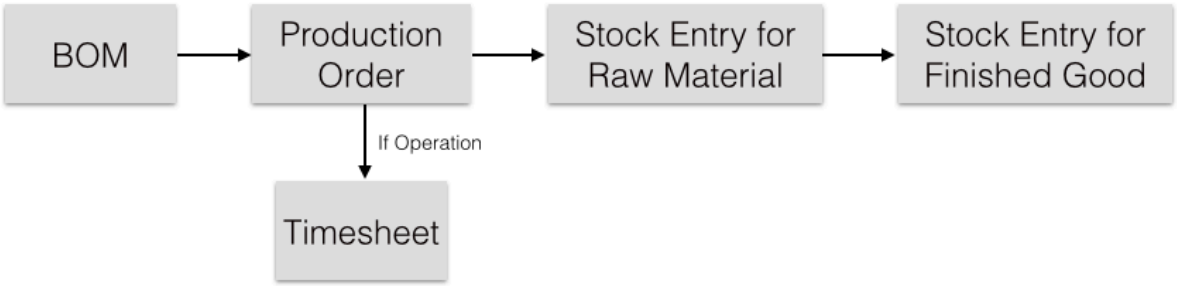
You can also create an Operation by: Manufacturing > Documents > Operation > New



1.3 Topic: Production

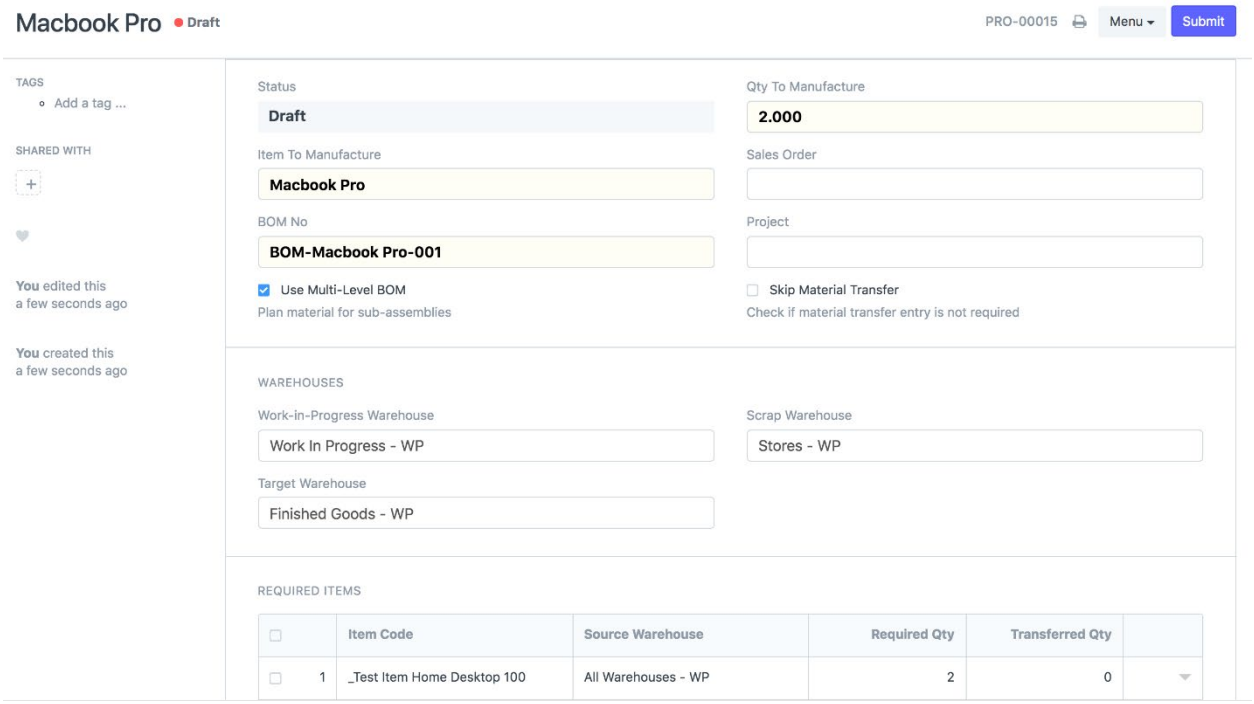
1. Work Order
2. Production Plan
3. Job Card

1. Work Order



A Work Order is a document that is given to the manufacturing shop floor by the Production Planner as a signal to produce a certain quantity of a certain Item. The Work Order also helps to generate the material requirements (Stock Entry) for the Item to be produced from its Bill of Materials.

The Work Order is generated from the Production Planning Tool based on Sales Orders. You can also create a direct Work Order by: Manufacturing > Documents > Work Order > New



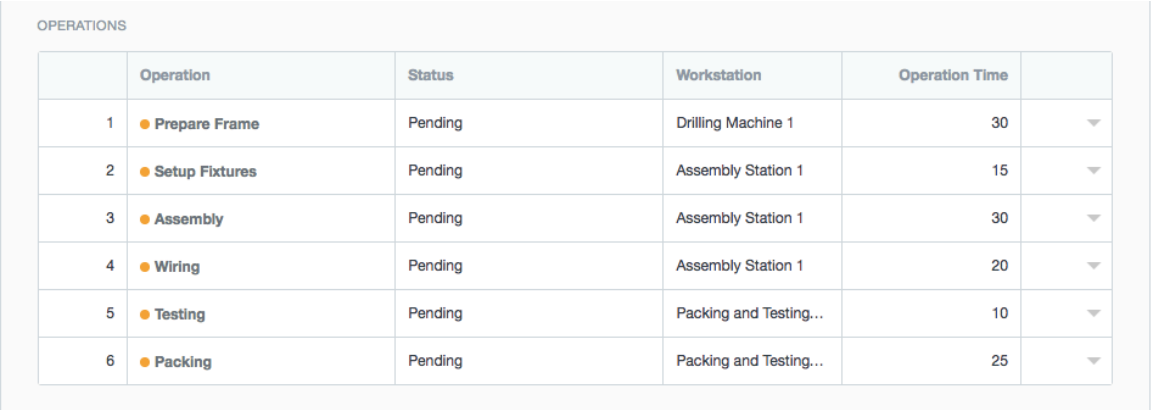
Creating Work Orders

- Select the Item to be produced.
- The default BOM for that item will be fetched by the system. You can also change BOM.
- Enter the Qty to manufacture.
- If the selected BOM has operation mentioned in it, the system shall fetch all operations from BOM.
- Mention the Planned Start Date (an Estimated Date at which you want the Production to begin.)
- Select Warehouses:
    - Source Warehouses: The warehouse where you store your raw materials. Each required item can have separate source warehouse. Group warehouse also can be selected as source warehouse. On submission of Work Order, the raw material will be reserved in these warehouses for production usage.
    - Work-in-Progress Warehouse: The warehouse where your Items will be transferred when you begin production. Group Warehouse can also be selected as Work-in-Progress warehouse.
    - Target Warehouse: The warehouse where you store finished Items before they are shipped.
    - Scrap Warehouse: Scrap Items will be stored in this warehouse.
- Required Items: All the required items (raw materials) will be fetched from BOM and populated in this table. Here you can also change the default source warehouse for any item. And during the production, you can track transferred raw materials from this table.

Note: You can save a Work Order without selecting the warehouses, but warehouses are mandatory for submitting a Work Order

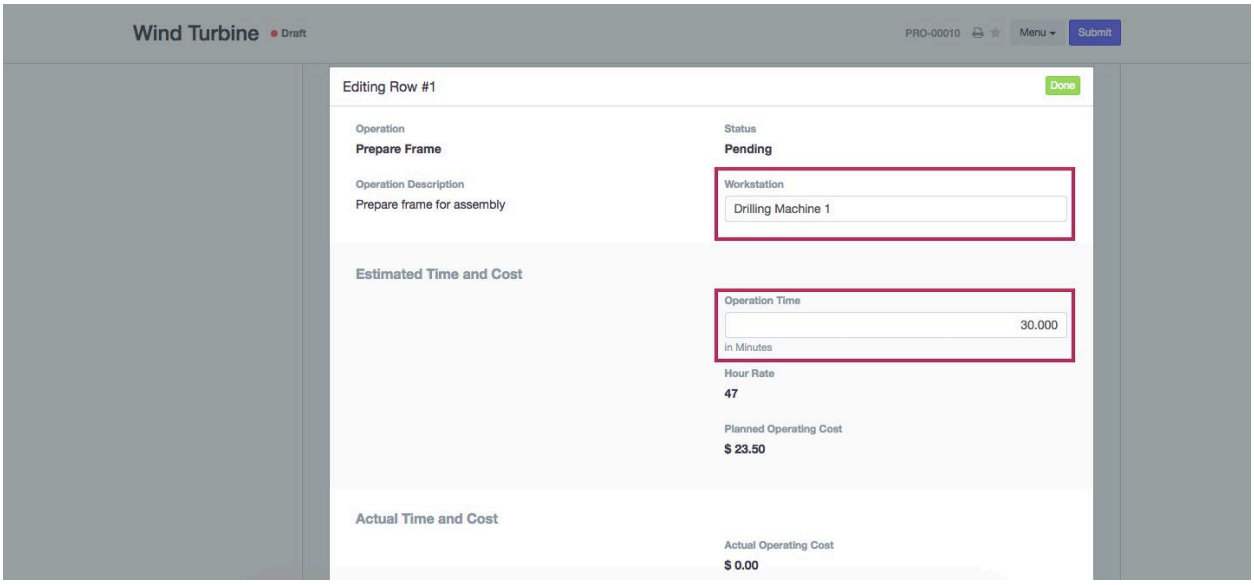
Reassigning Workstation/Duration for Operations

- By default, the system fetches workstation and duration for Work Order Operations from the selected BOM.


OPERATIONS

	Operation	Status	Workstation	Operation Time	
1	Prepare Frame	Pending	Drilling Machine 1	30	
2	Setup Fixtures	Pending	Assembly Station 1	15	
3	Assembly	Pending	Assembly Station 1	30	
4	Wiring	Pending	Assembly Station 1	20	
5	Testing	Pending	Packing and Testing...	10	
6	Packing	Pending	Packing and Testing...	25	

- If you wish to reassign the workstation for a particular operation in the Work Order, you can do so before submitting the Work Order.



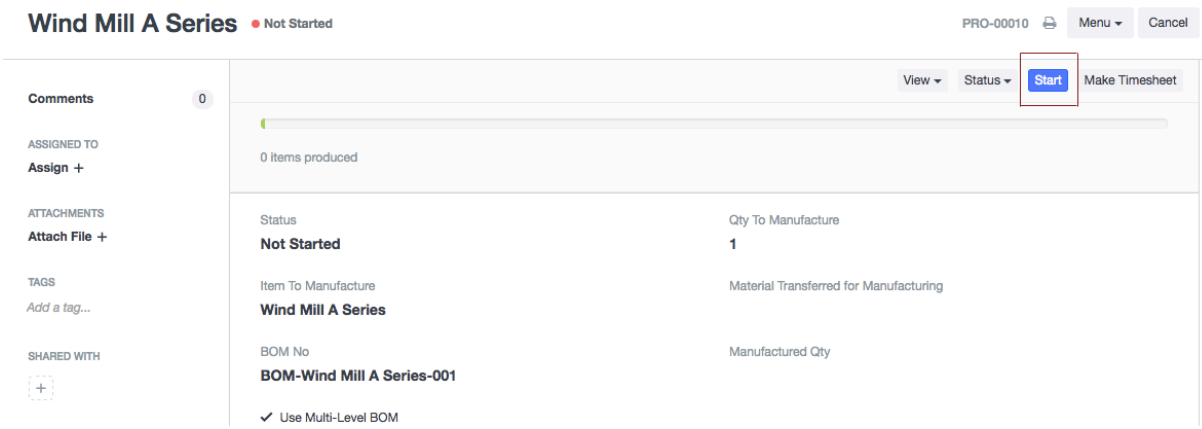
- Select the respective operation, and change its workstation.
- You can also change the Operating Time for that operation

Capacity Planning in Work Order

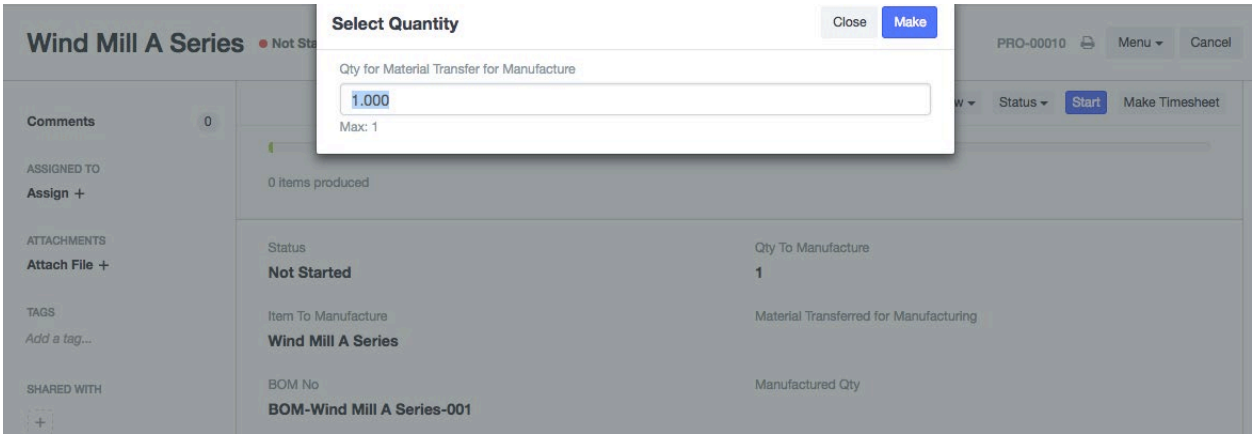
- When a Work Order is submitted, based on the Planned Start Date and the availability of the workstations, system schedules all operations for the Work Order (if Work Order has operations specified).
- Drafts of Time Logs are also created based on the scheduled operations.

Transferring Materials for Manufacturing

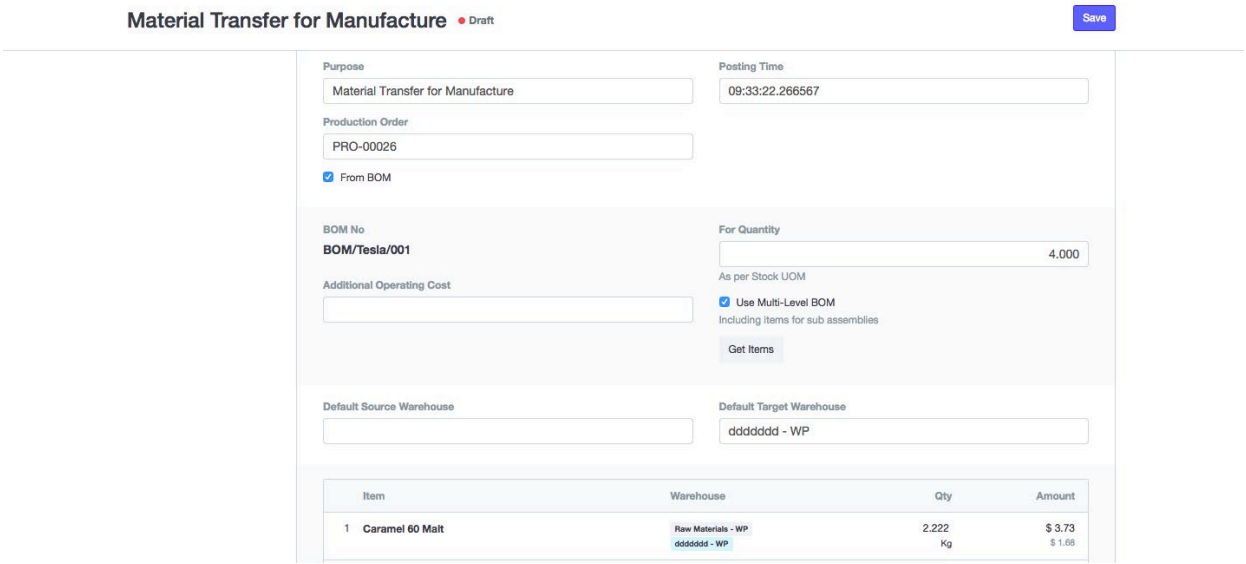
- Once you have submitted your Work Order, you need to Transfer the Raw Materials to initiate the Manufacturing Process.
- This will create a Stock Entry with all the Items required to complete this Work Order to be added to the WIP Warehouse. (this will add sub-Items with BOM as one Item or explode their children based on your setting above).
- Click on 'Start'.



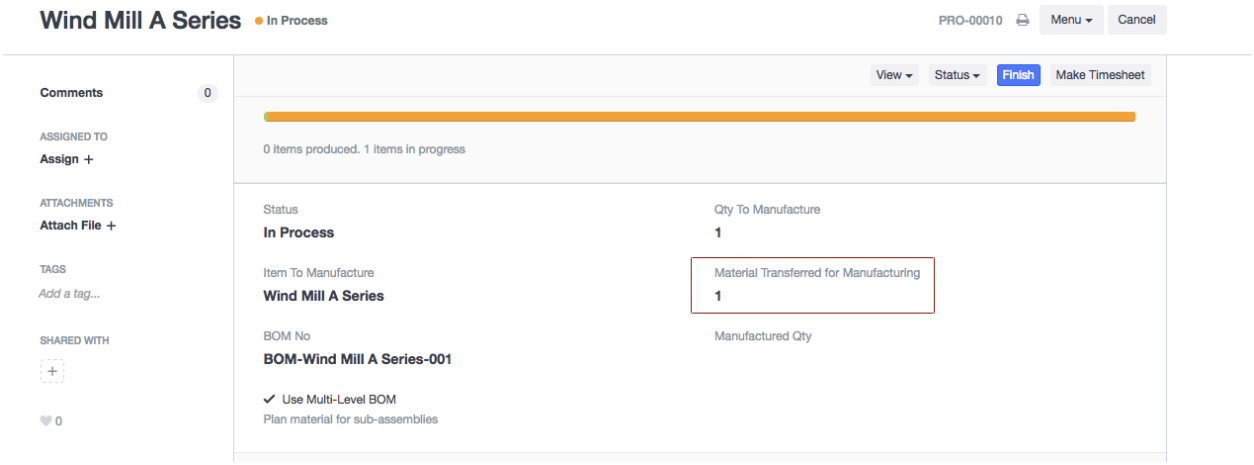
- Mention the quantity of materials to be transferred.



- Submit the Stock Entry



- Material Transferred for Manufacturing will be updated in the Work Order based on the Stock Entry.

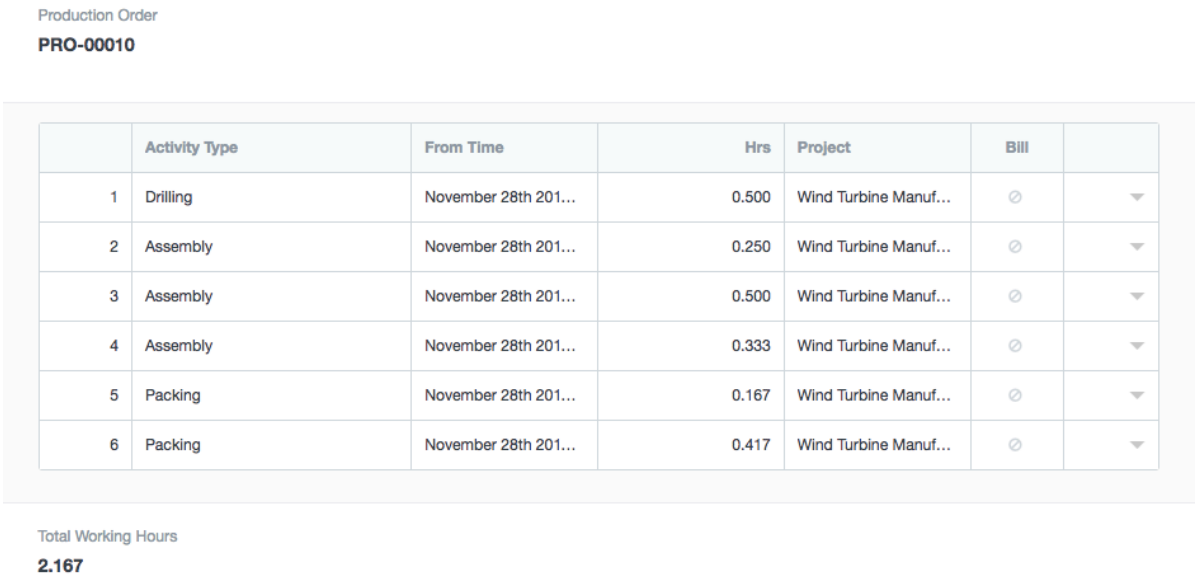


Material Transfer through Stock Entry

Use cases for this option are: * If material transfer is done in bulk and/or is not required to be tracked against a particular Work Order * If the responsibility for Material Transfer and Production Entry lies with two separate users. If this is the case, you can select the Skip Material Transfer check box, which will allow you to make the “Manufacture” Stock Entry directly by clicking on the ‘Finish’ button.

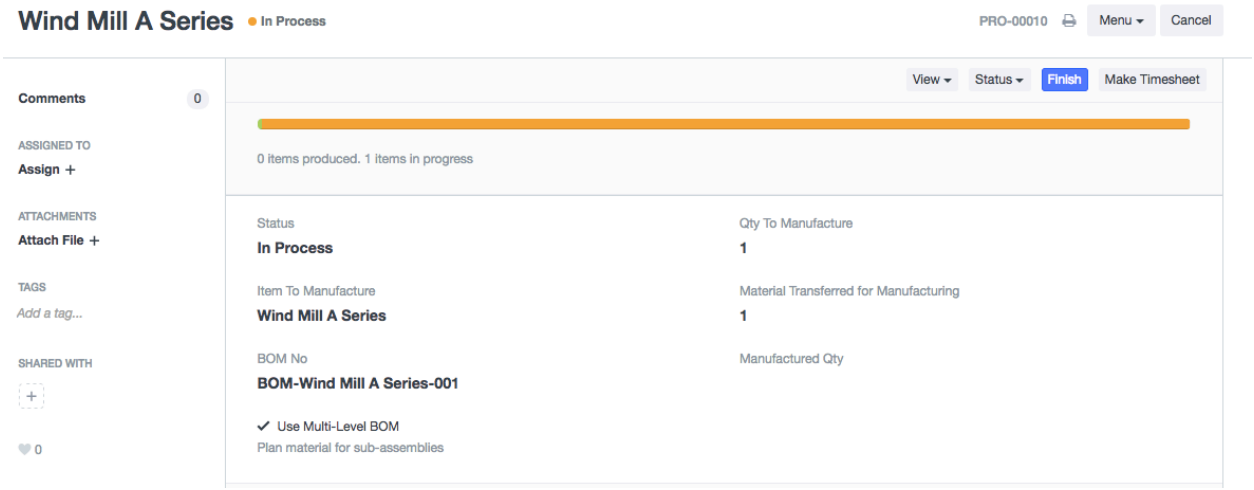
Making Time Logs

- Progress in the Work Order can be tracked using Timesheet
- Timesheet's time slots are created against Work Order Operations.
- Drafts of Timesheet are created based on the scheduled operations when a Work Order is Submitted.
- To create more Timesheets against an operation, click 'Make Timesheet' button.

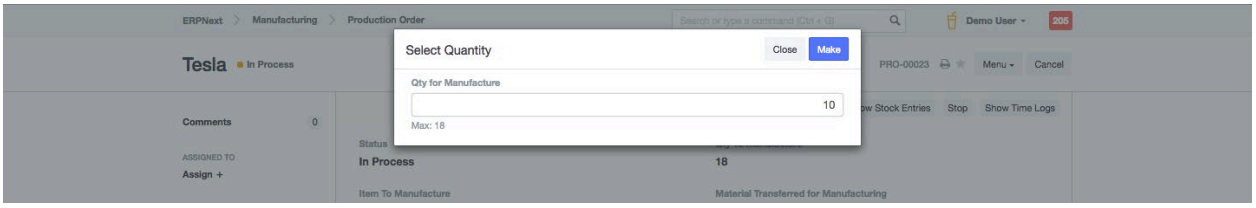


Updating Finished Goods

- Once you are done with the Work Order you need to update the Finished Goods.
- This will create a Stock Entry that will deduct all the sub-Items from the WIP Warehouse and add them to the Finished Goods Warehouse.
- Click on 'Finish'.



- Mention the quantity of materials to be transferred.



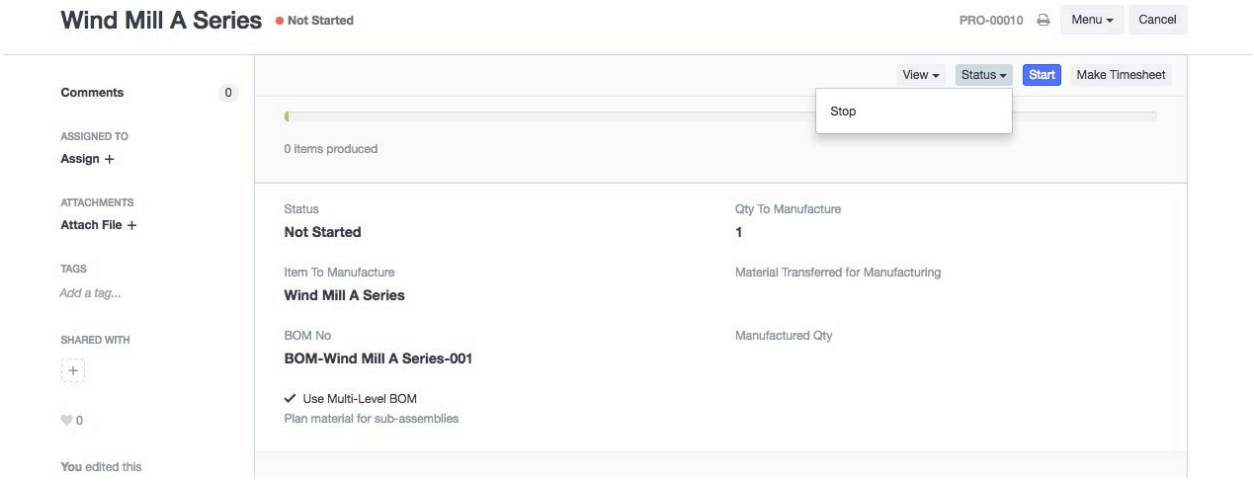
Tip: You can also partially complete a Work Order by updating the Finished Goods stock creating a Stock Entry.

Stopping a Work Order

- When you stop a Work Order its status is changed to Stop indicating that all production process against that Work Order is to be ceased.
- To stop the Work Order, click on the 'Stop' Button

1. On Submitting the Work Order, the system will reserve a slot for each of the Work Order Operations serially after the planned start date based on the workstation availability. The Workstation availability depends on the Workstation timings, holiday list and if some other Work Order Operation was scheduled in that slot. You can mention the number of days for the system to try scheduling the operations in the Manufacturing Settings. This is set to 30 Days by default. If the operation requires time exceeding the available slot, system shall ask you to break the operations. Once the scheduling is done system shall create Time Logs and save them. You can Modify them and submit them later.

2. You can also create additional time logs against an Operation. For doing so select the respective operation and click on 'Make Time Log'
3. Transfer Raw Material: This will create a Stock Entry with all the Items required to complete this Work Order to be added to the WIP Warehouse. (this will add sub-Items with BOM as one Item or explode their children based on your setting above).
4. Update Finished Goods: This will create a Stock Entry that will deduct all the sub-Items from the WIP Warehouse and add them to the Finished Goods Warehouse.
5. To check all Time Logs made against the Work Order click on 'Show Time Logs'



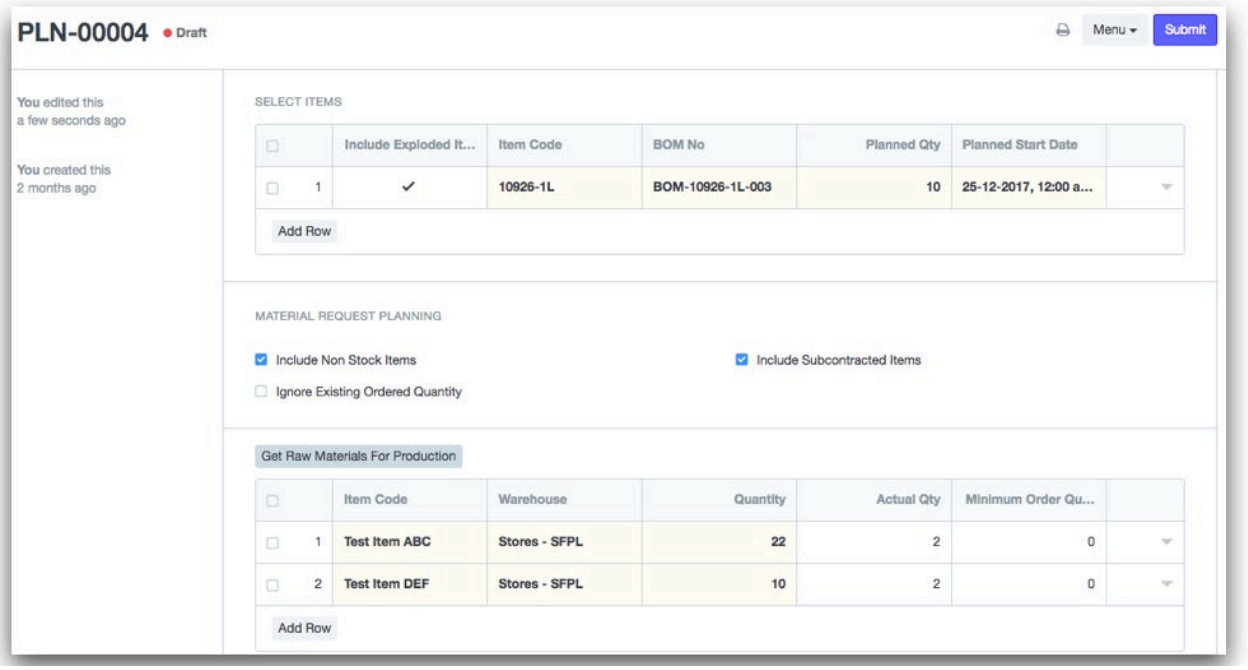
- You can also re-start a stopped Work Order.

Note: In order to make a Work Order against an Item you must specify 'Yes' to "Allow Work Order" on the Item form.

2. Production Plan

Production Plan helps user to plan production against multiple sales orders or the material requests. Also, it helps in Material Procurement planning for the raw-material item, based on the quantity of finished product to be manufactured.

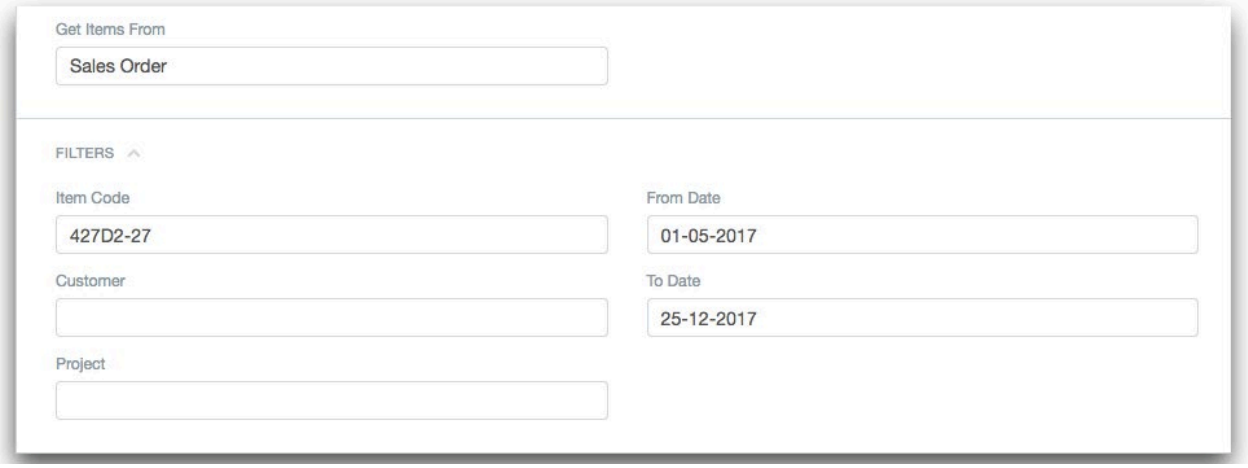
To use the Production Plan, go to: Manufacturing > Production > Production Plan



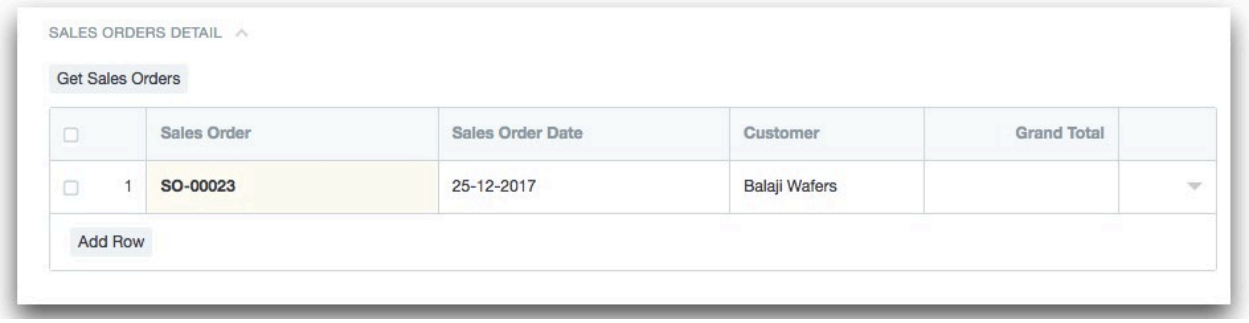
Planning for Production

Production Against Sales Orders

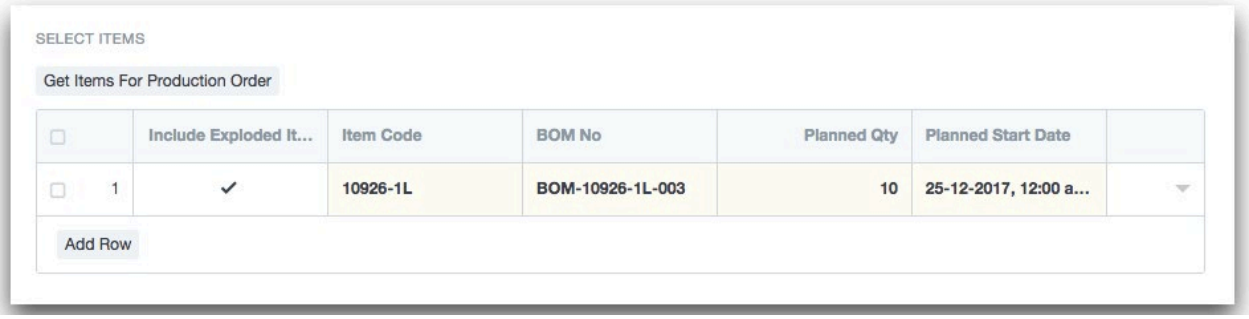
- Select option as Sales Order from the drop-down list of get items from. System will show the filters, using that we can pull the sales orders for the production.



- Click on Get Sales Orders to fetch sales orders based on above filters



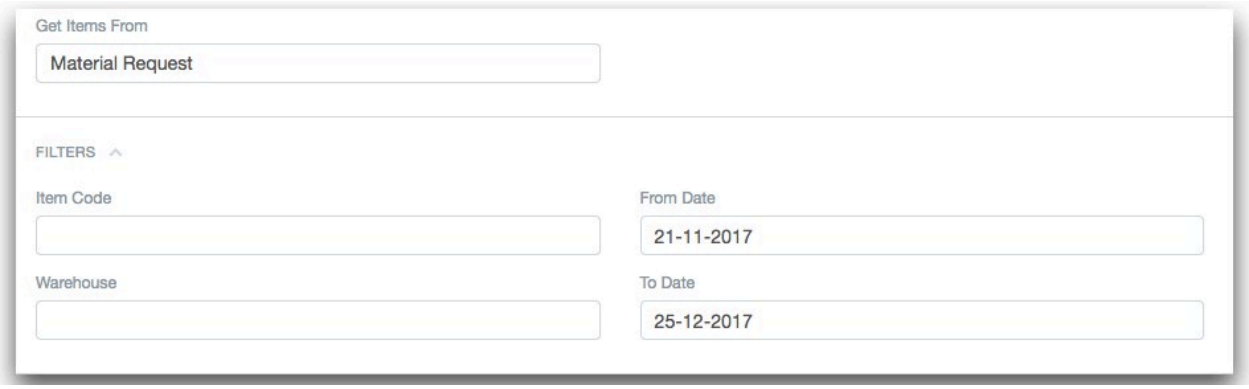
- Click on Get Items for Work Order to fetch the items from the above sales orders.



* Include Exploded Items: To include subassembly items of raw materials in the production.

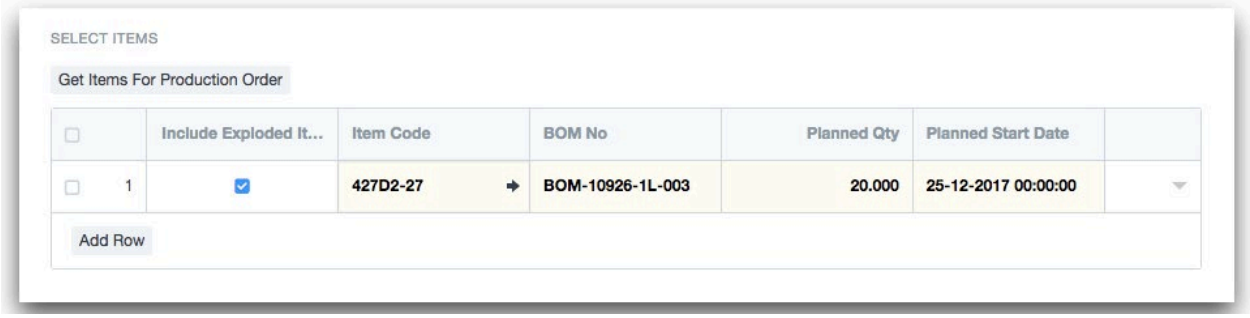
Production Against Material Requests

- Select option as Material Request from the drop-down list of get items from. System will show the filters, using that we can pull the material requests for the production.



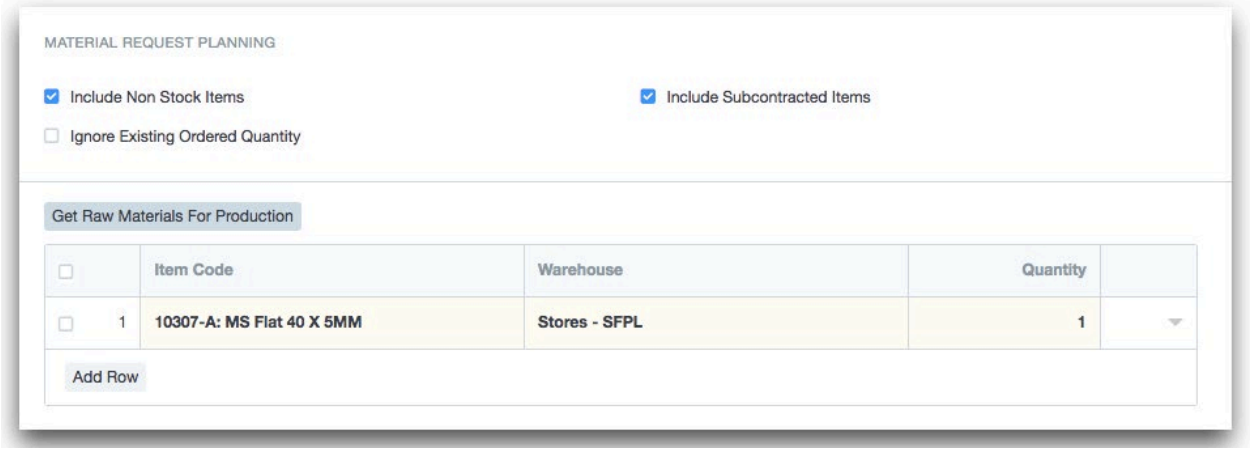
- Click on Get Material Request to fetch material requests based on above filters

- Click on Get Items for Work Order to fetch the items from the above material requests.



Planning for Material Requests

- Click on get raw materials for production button to fetch raw materials required in the production.



- Include Non-Stock Items: To add non stock items in the material request planning.
- Include Subcontracted Items: To add subcontracted item's raw materials if include exploded items is disabled
- Ignore Existing Ordered Quantity: If enabled then system will not check the projected quantity to make material request.

Options to Make Work Order and Material Request

3. Job Card

A Job Card is created from the Work Order and given to each of the workstation in the manufacturing floor to start the production of an item with a certain quantity in each of the operations defined in the Work Order.

The Job Card extends the functionality of the Work Order in the manufacturing process by adding/defining phase of operations in work orders and assigning each operation into their respective workstation.

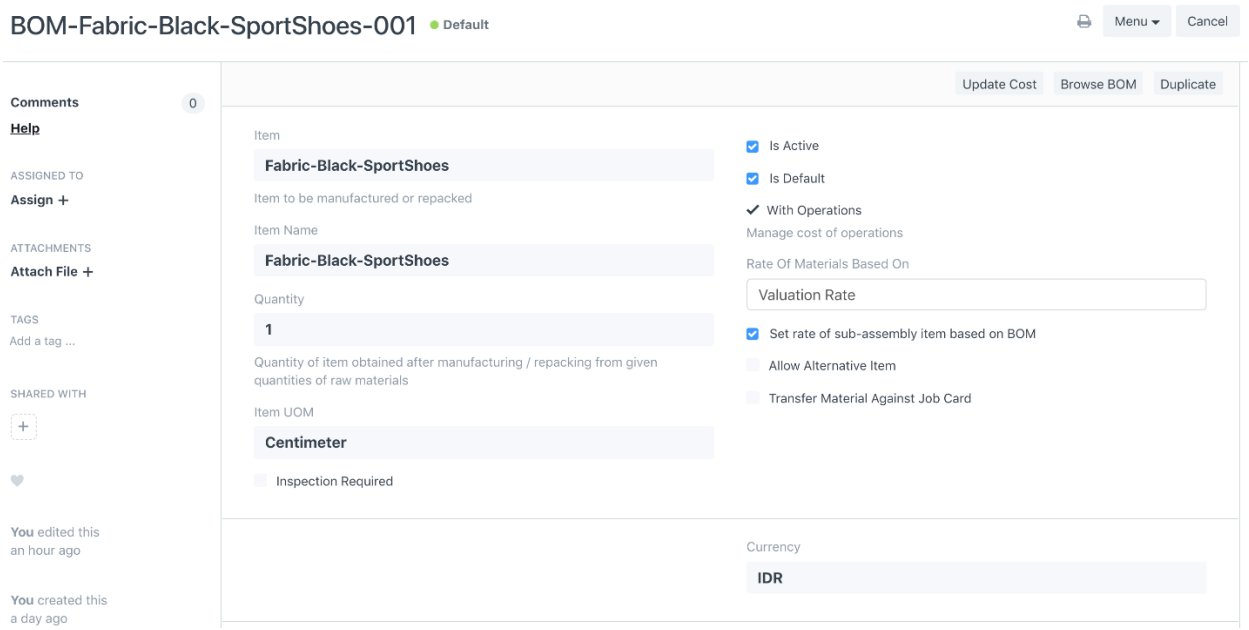
Job Card allows each operation's workstation to issue a “Material Request” and “Stock Transfer to Manufacture” for raw material required against a “Job Card” order assigned to them.

Job Card completion will change the production status in Work Order, we can track completion of production progress for each of the operations defined in the work order. Manufacturing > Work Order > Create Job Card

Job Card creation based on BOM

In the Work Order, the Operations and Workstations are fetched from the BOM of an Item. Hence, you should ensure that Routing (master of Operations and Production) is configured in the BOM. Here are the steps for the same.

- Define the Item BOM for production, select “With Operations” on the checklist.



- Define the production flow by selecting operations in BOM.

OPERATIONS

Specify the operations, operating cost and give a unique Operation no to your operations.

Routing

Shoe Making Process

	Operation	Workstation	Description	Operation Time	Operating Cost
1	**Leather Cutting**	Cutting	Cutting	**20**	Rp 2.166,67
2	**Leather Sewing**	Leather Sewing	Sewing Front & Pac...	**40**	Rp 4.346,67
3	**Stock Fit**	Sole Stock Fit	Stock Fit	**20**	Rp 2.166,67
4	**Assembly**	Assembly	Assembly	**50**	Rp 5.416,67
5	**Finishing**	Finishing	Finishing	**30**	Rp 2.000,00

- Select Item required for production, assign each of the Item into Operations.

Item Code

Shoe Leather-Cokelat-FullGrain-RawMaterial

Item Name

Shoe Leather-Cokelat-FullGrain-RawMaterial

DESCRIPTION

QUANTITY AND RATE

Qty

20

Stock Qty

20

UOM

Square Centimeter

Stock UOM

Square Centimeter

Conversion Factor

1

RATE & AMOUNT

Rate (IDR)

Rp 1.400,06

Amount (IDR)

Rp 28.001,20

Scrap %

0

✓ Allow Transfer for Manufacture

Item operation

Leather Cutting

You can select “Transfer Material Against Job Card” to transfer raw material for production based on the Job Card, and not by Work Order.

Define “Operations” cycle/flow involved in the Item Select the Item required and assign material to operations for manufacturing.

OPERATIONS

Specify the operations, operating cost and give a unique Operation no to your operations.

Routing

Shoe Making Process

	Operation	Workstation	Description	Operation Time	Operating Cost
1	**Leather Cutting**	Cutting	Cutting	**20**	Rp 2.166,67
2	**Leather Sewing**	Leather Sewing	Sewing Front & Pac...	**40**	Rp 4.346,67
3	**Stock Fit**	Sole Stock Fit	Stock Fit	**20**	Rp 2.166,67
4	**Assembly**	Assembly	Assembly	**50**	Rp 5.416,67
5	**Finishing**	Finishing	Finishing	**30**	Rp 2.000,00

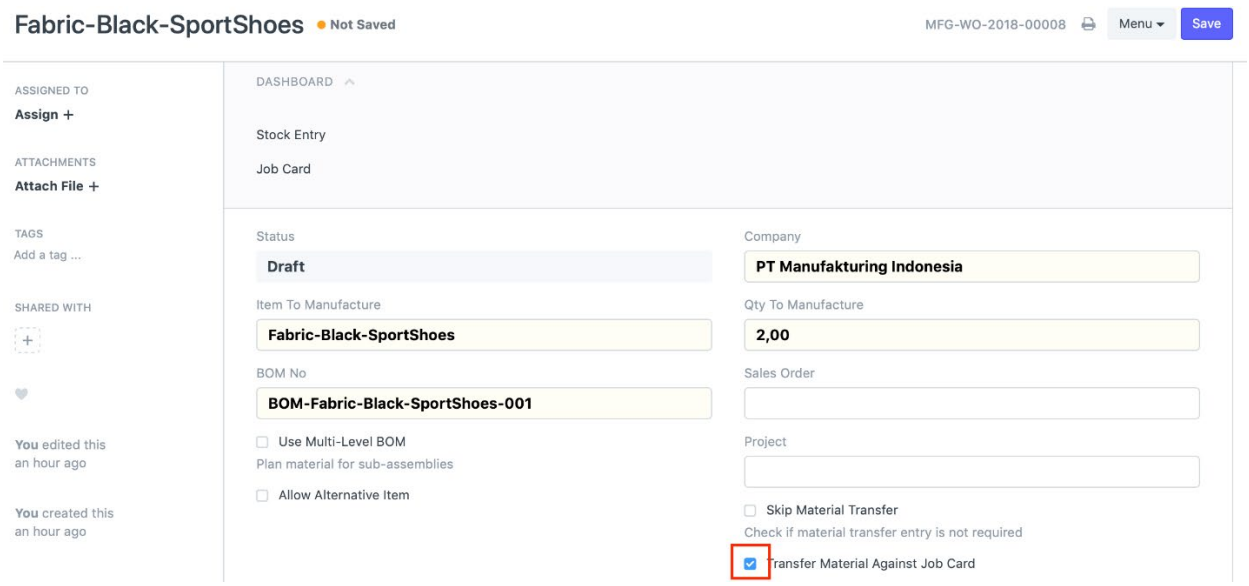
You can select “Transfer Material Against Job Card” on the Bill of Material to transfer Material for Production based on Job Card.

Routing in Work Order

Job Card will be created upon submission of the Work Order based on the Operations defined in the Bill of Material. Each Job Card represents job order for each Workstations on the manufacturing floor.

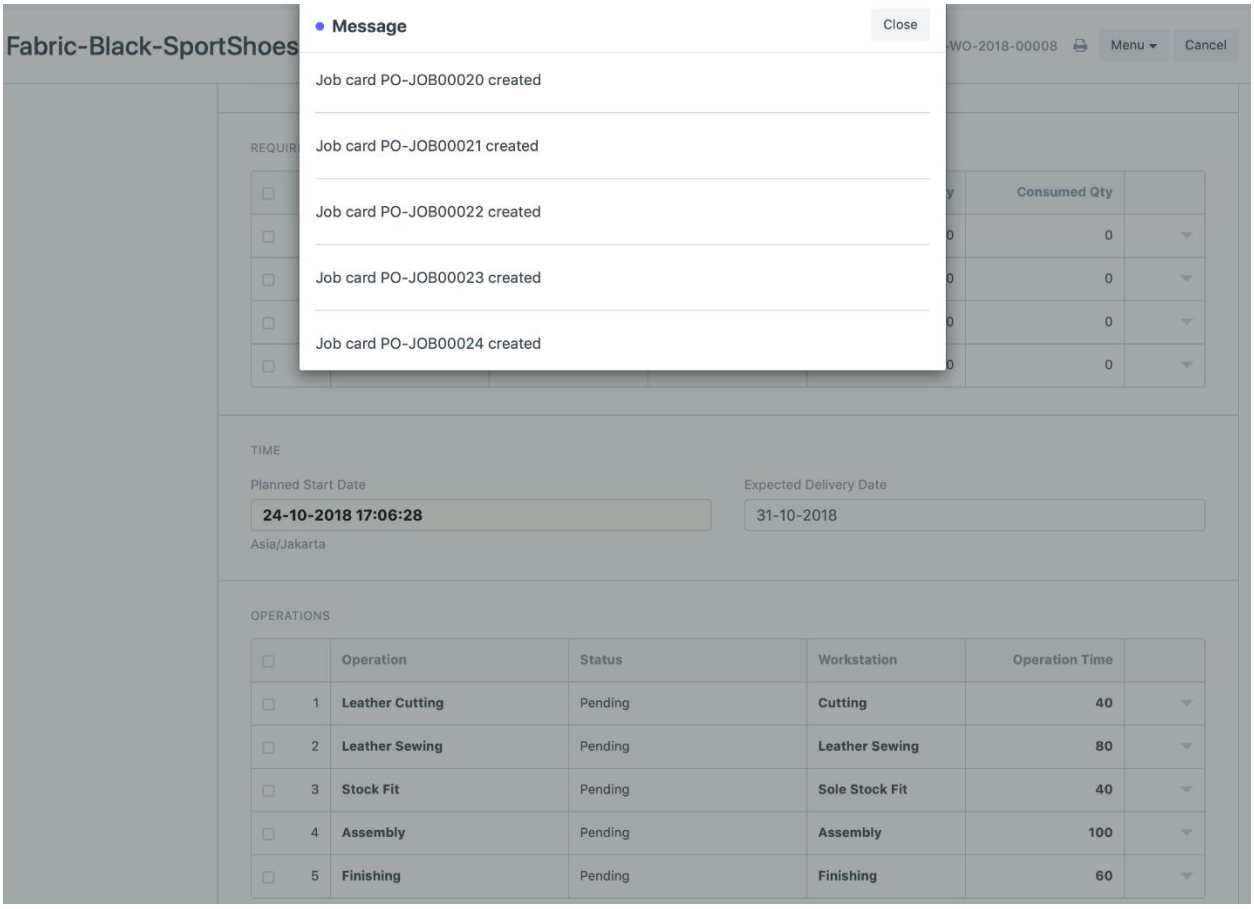
Select Work Order with Item to Manufacture

In the Work Order, define if you want to transfer material against a Job Order or no.



Job Card Creation

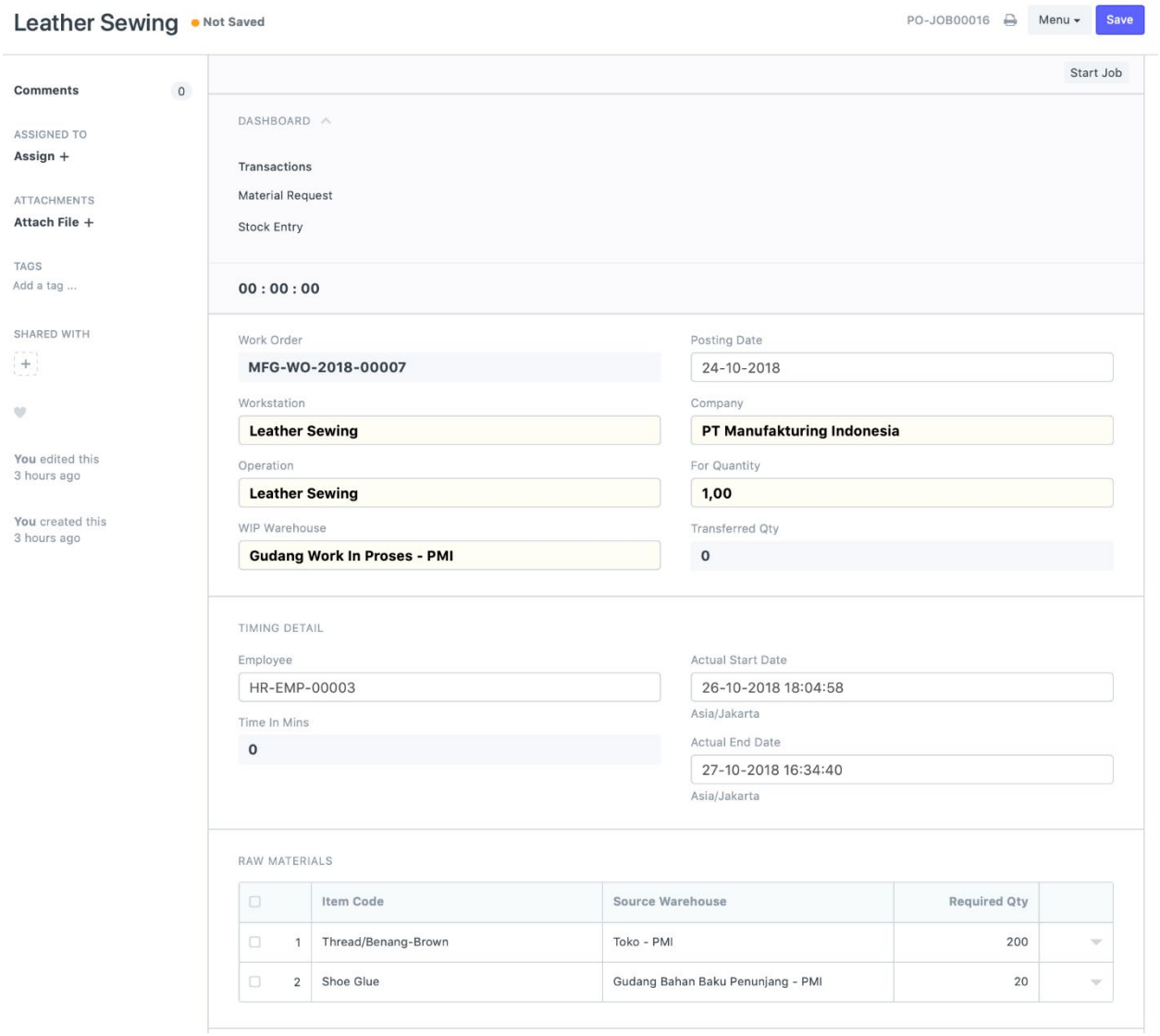
On submission of Work Order, Job Cards will be auto-created based on the values in the Routing table.



Job Card

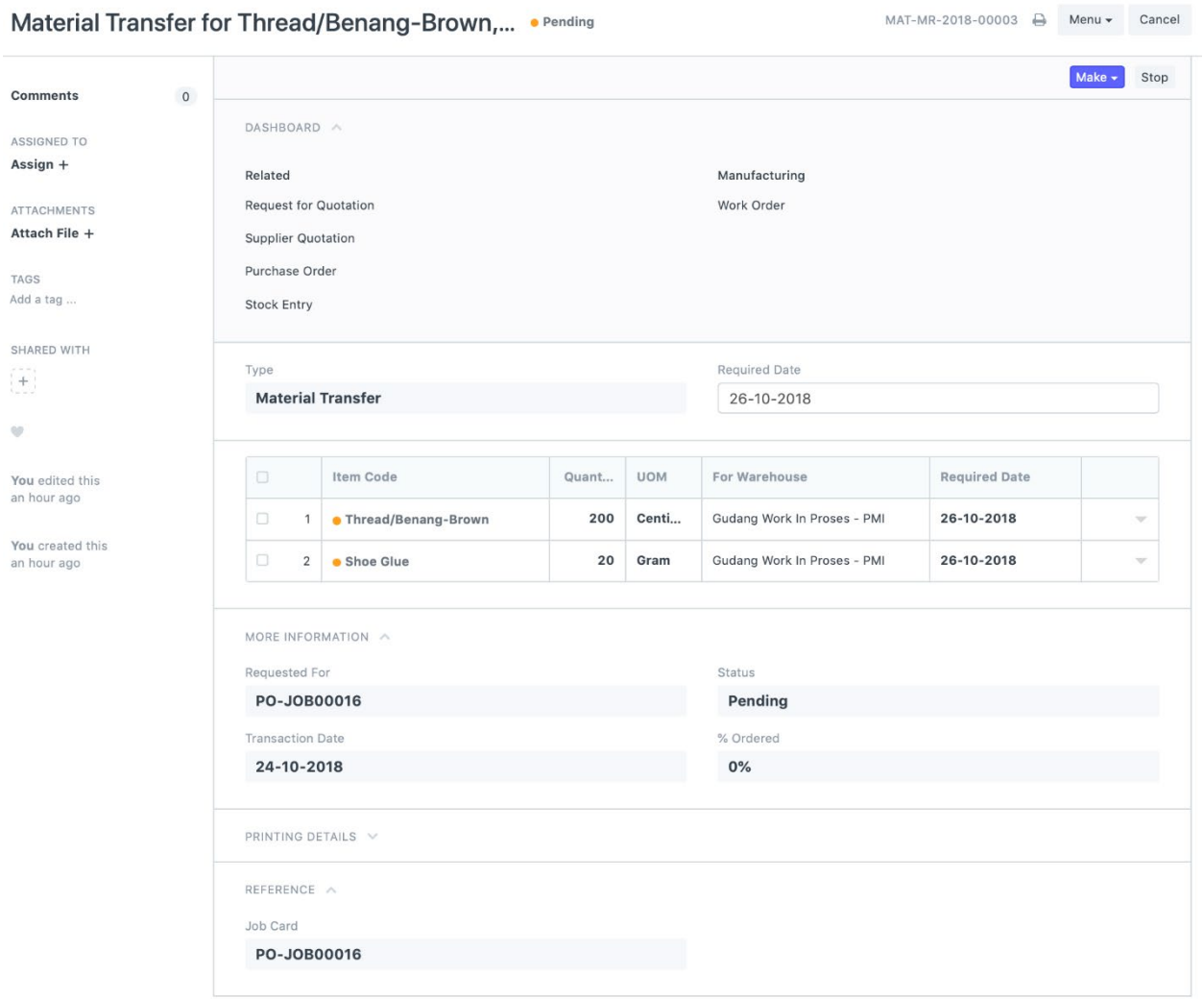
Each Job Card created will have Workstation & Operations assigned. Raw material required from each source warehouse will be calculated based on quantity required for production.

Employee assignment and timing detail will also be defined in Job Card.



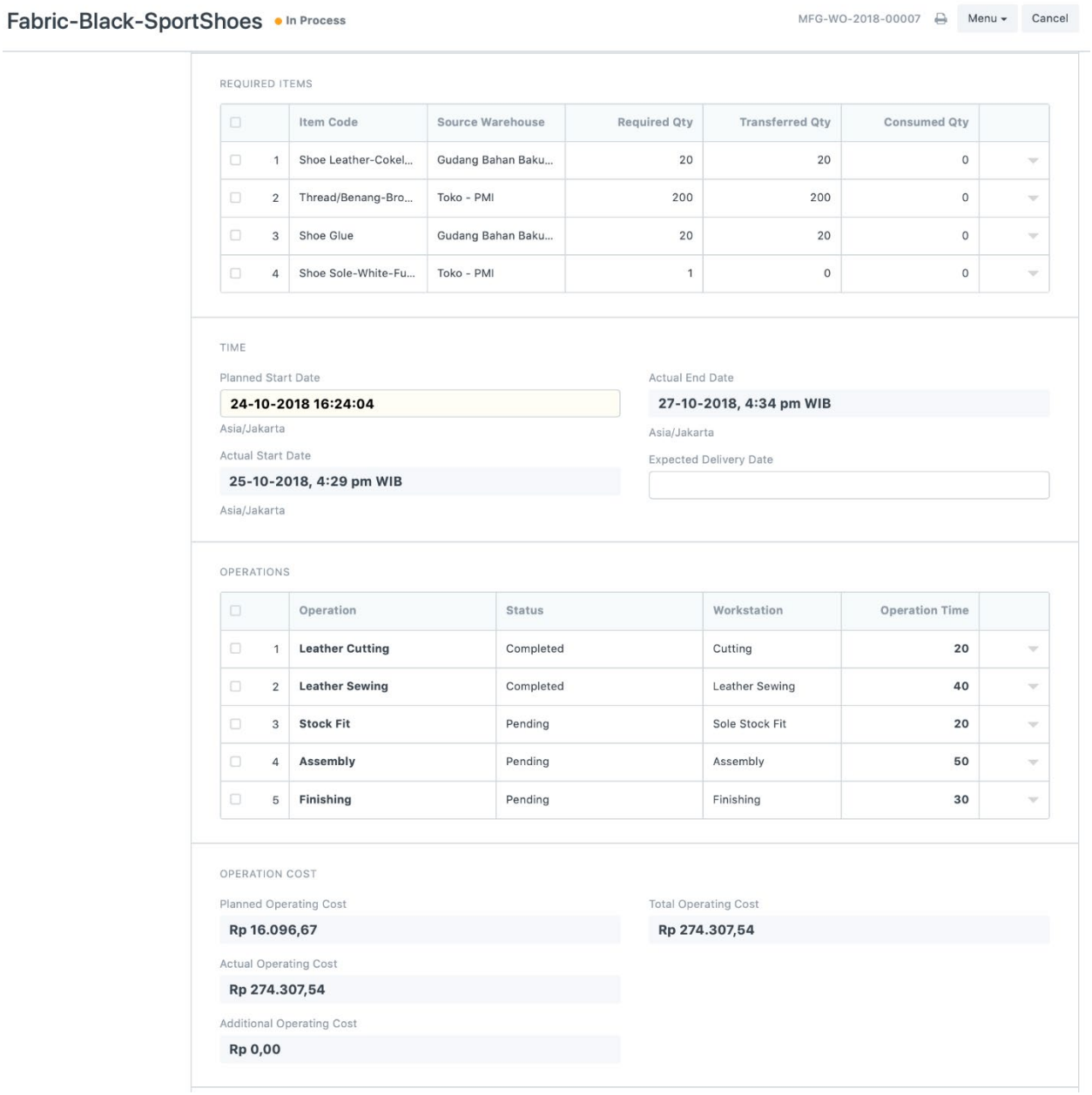
Material Request against Job Card

A Material Request will be raised from the Job Card as a basis/order to prepare raw-material required for manufacturing process. The Material Request raised will have its reference to the original Job Card number.



Track the Manufacturing Progress in The Work Order by The Completion of Each Operations defined in Work Order.

Job Card completion allow us to track the manufacturing progress inside the Work Order by looking of the completion of each Operations that are related in the Work Order.



1.4 Topic: Advanced

1. Subcontracting
2. Item Alternative
3. BoM Update Tool

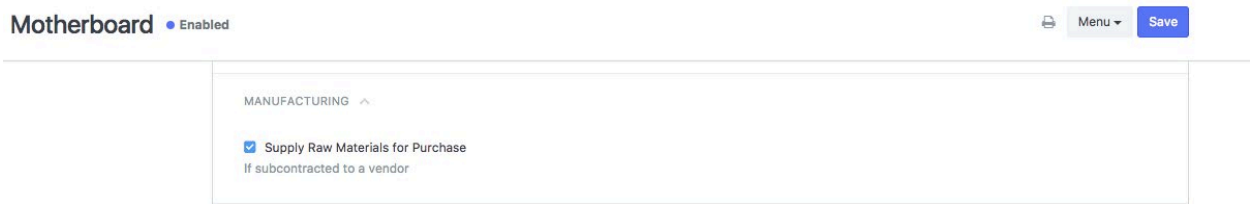
1. Subcontracting

Subcontracting is a type of job contract that seeks to outsource certain types of work to other companies. It allows work on more than one phase of the project to be done at once, often leading to a quicker completion. Subcontracting is practiced by various industries. For example, manufacturers making a number of products from complex components subcontract certain components and package them at their facilities.

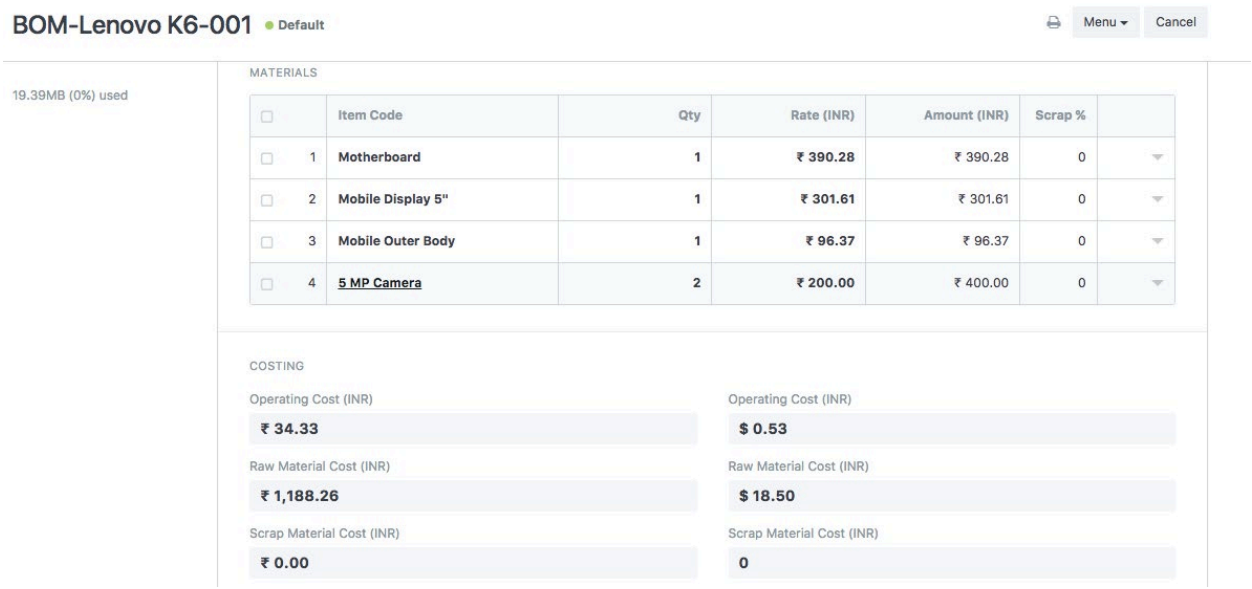
If your business involves outsourcing certain processes to a third-party Supplier, where you buy the raw material from, you can track this by using the sub-contracting feature of ERP+.

Setup Sub-Contracting:

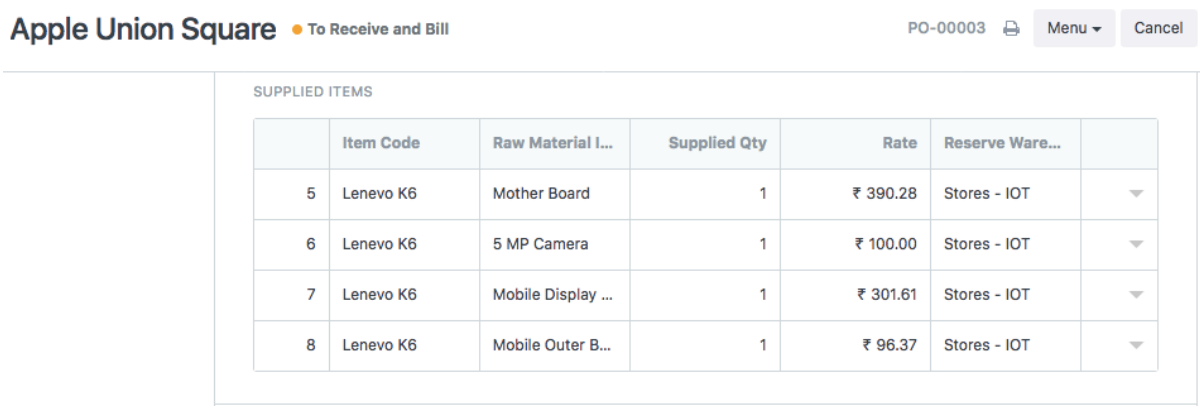
1. Create separate Items for the unprocessed and the processed product. For example, if you supply unpainted X to your Supplier and the Supplier returns you X, you can create two Items: “X-unpainted” and “X”.
2. Create a Warehouse for your Supplier so that you can keep track of Items supplied. (you may supply a month’s worth of Items in one go).
3. For the processed Item, in the Item master, set “Is Sub Contracted Item” to “Yes”.



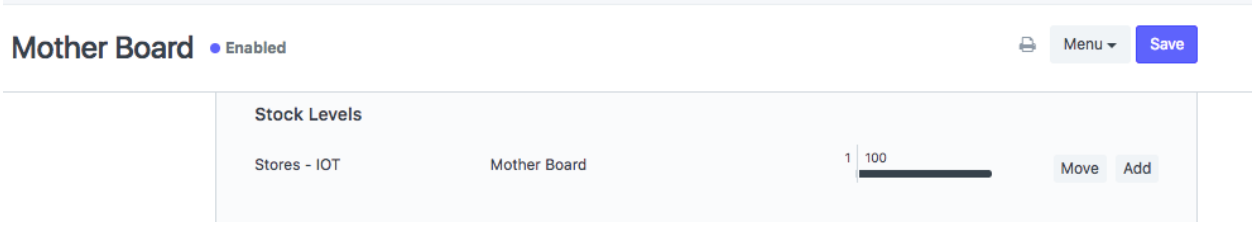
Step 1: Make a Bill of Materials for the processed Item, with the unprocessed Items as sub-items. For example, If you are manufacturing a pen, the processed pen will be named under Bill of Materials (BOM), whereas, the refill, knob, and other items which go into the making of pen, will be categorized as sub-items.



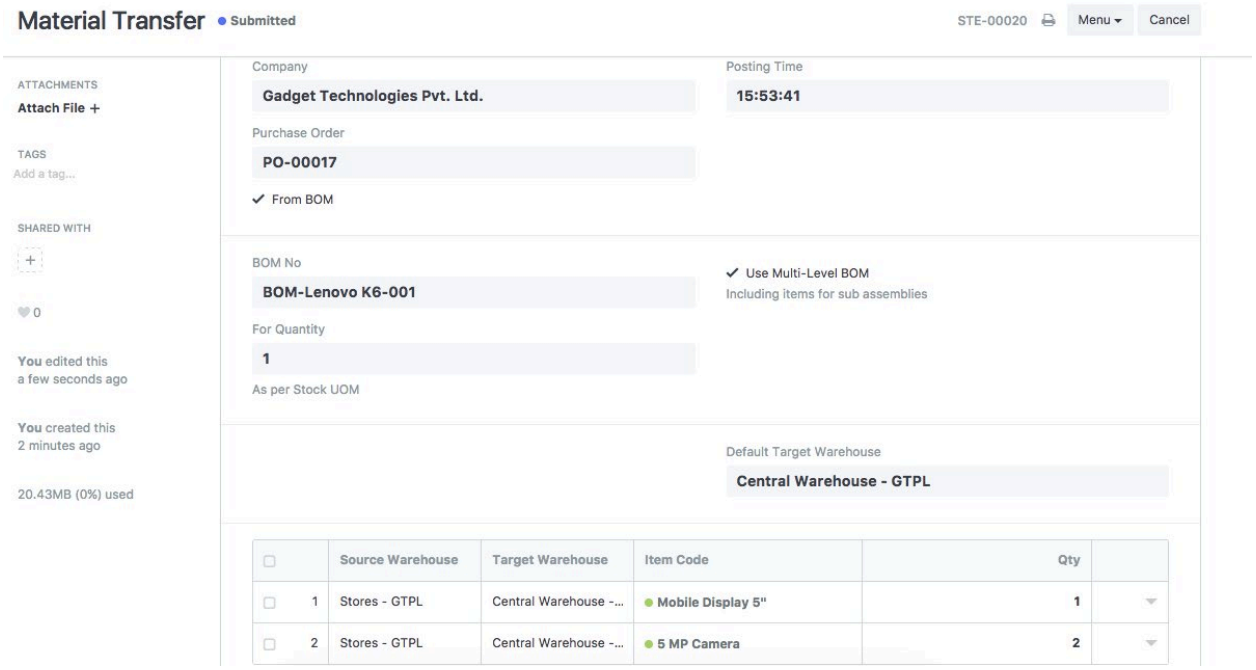
Step 2: Make a Purchase Order for the processed Item. When you "Save", in the "Raw Materials Supplied", all your un-processed Items will be updated based on your Bill of Materials. You can also select the warehouse from which the material would be reserved for sub-contracting.



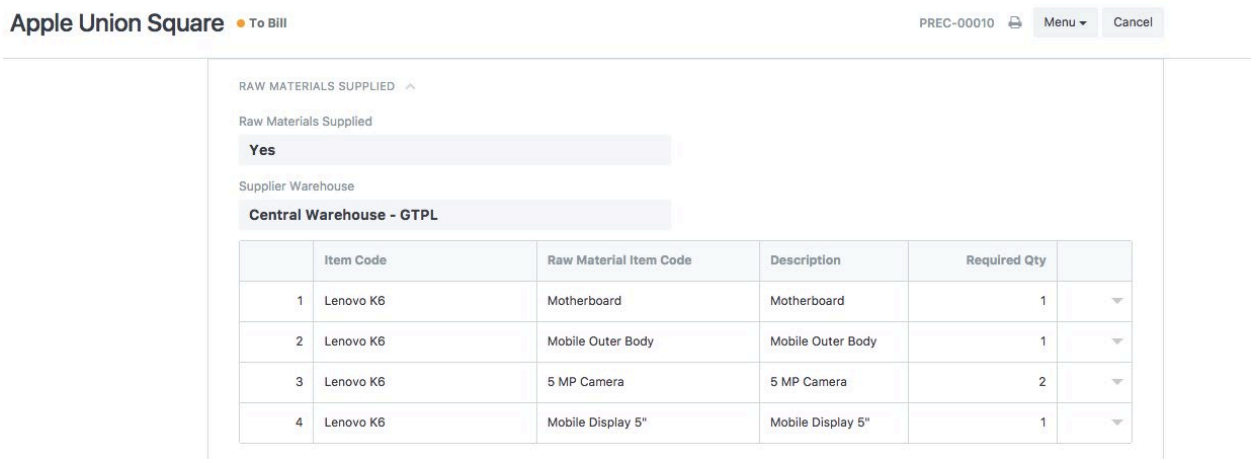
Once the PO is submitted, you can view the reserved quantity of the item from the item dashboard as well.



Step 3: Make a Stock Entry to deliver the raw material Items to your Supplier.



Step 4: Receive the Items from your Supplier via Purchase Receipt. Make sure to check the "Consumed Quantity" in the "Raw Materials" table so that the correct stock is maintained at the Supplier's end.

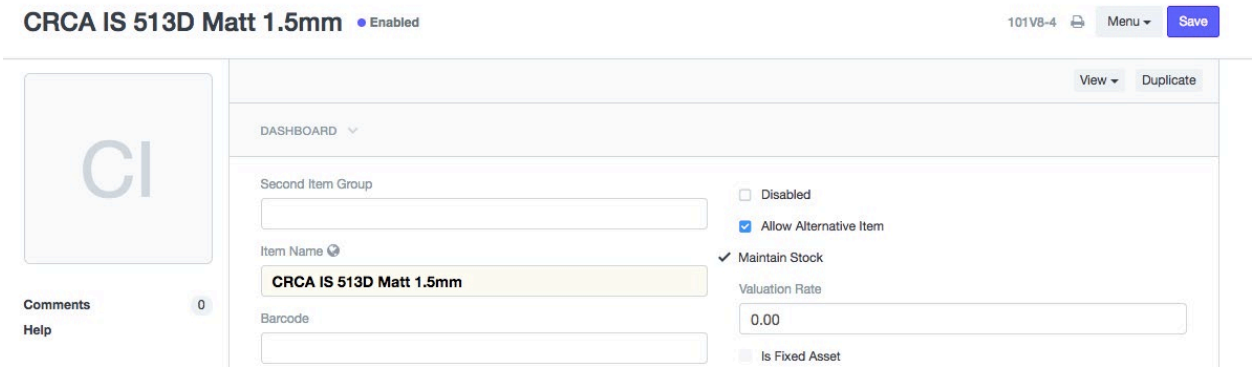


Note 1: Make sure that the "Rate" of processed Item is the processing rate (excluding the raw material rate).
Note 2: ERP+ will automatically add the raw material rate for your valuation purpose when you receive the finished Item in your stock.
Note 3: ERP+ will automatically default the Reserve Warehouse in the PO from the BOM. If not found in the BOM, it would default it from the default warehouse setup in the Item.

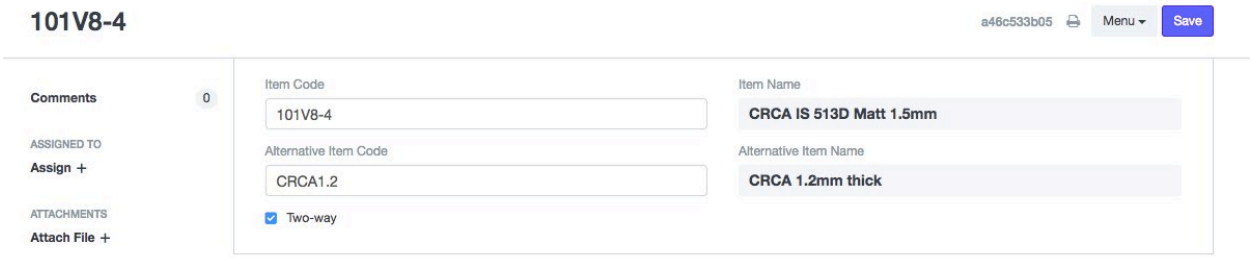
2. Item Alternative

Item alternative feature is very useful in manufacturing industries, if the raw material defined in the BOM is not available during the production process then their respective available alternative item used to complete the production process.

To make item alternative for an item, kindly enable the "Allow Alternative Item" in the item.



- To make item alternative, go to module Stock > Items and Pricing > Item Alternative

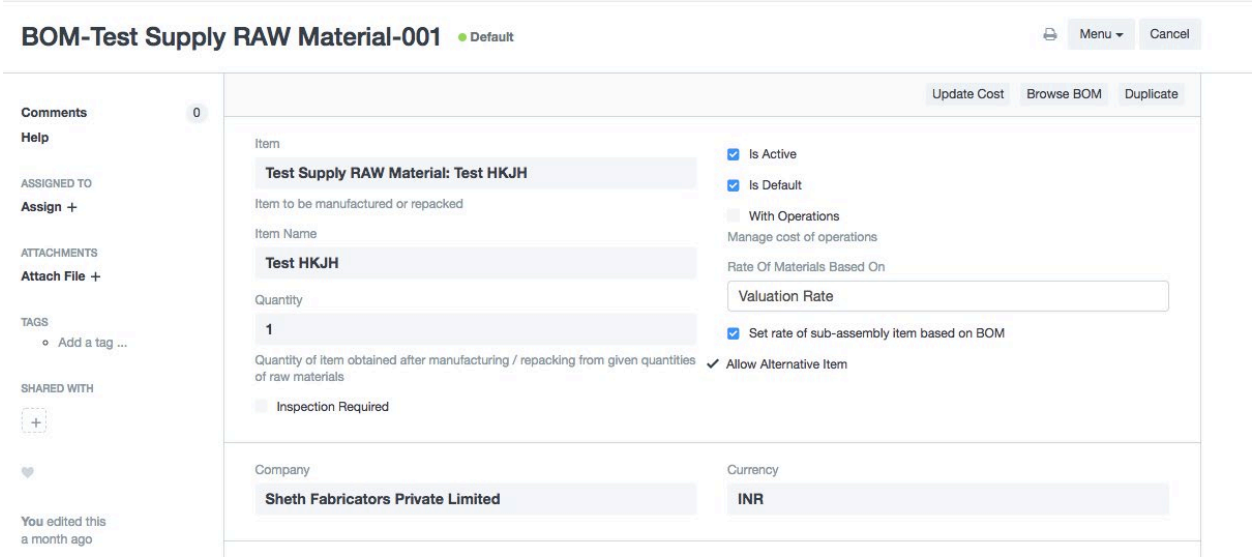


The user can enable Two-Way between an item and their alternative item if both can be used as an alternative to each other

Item Alternative for work order

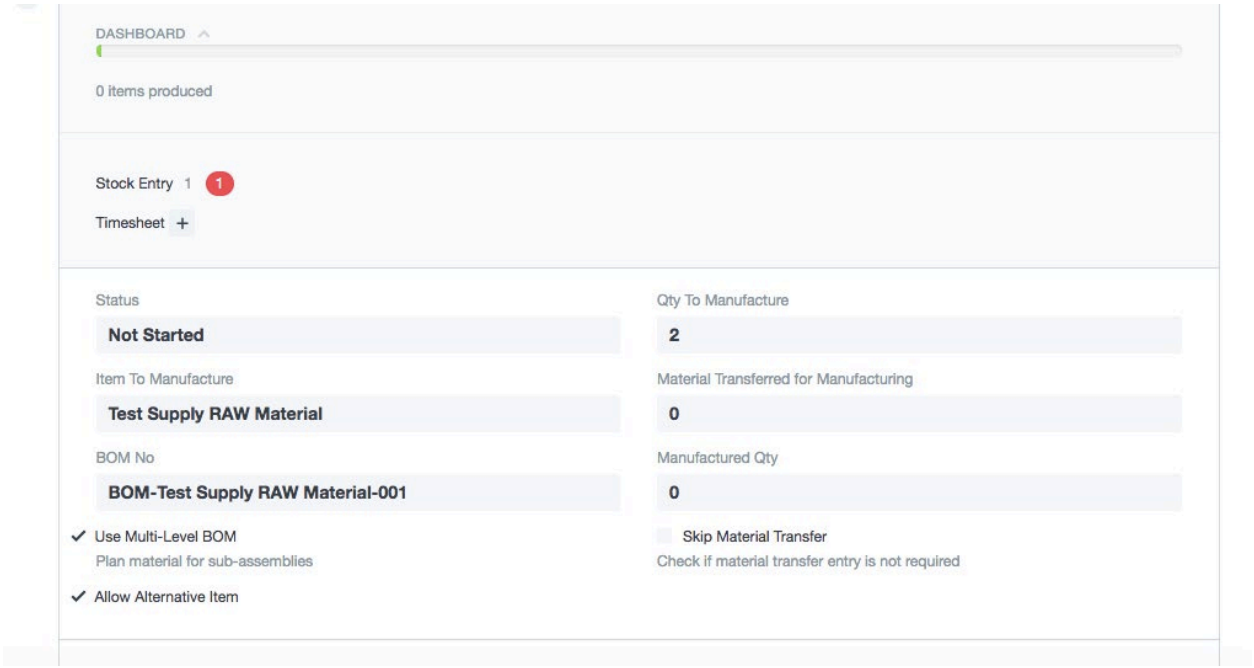
To allow to use alternative items in the manufacturing process user can configure allow an alternative item in the BOM/Work Order

Provision to allow alternative item in the BoM



Provision to allow alternative item in the work order

User can also enable/disable allow alternative item in the work order



Item Alternative for subcontract

In subcontract, the user has to transfer raw materials to the subcontracted supplier to get finished good from them. If the raw material is not available in the stock, with this feature, the user can transfer the alternate item of the subcontracted raw material to the supplier.

2.1 Article: Production

1. Production Planning Subassembly
2. Capacity Planning
3. Open Work Orders

1. Production Planning & Subassembly

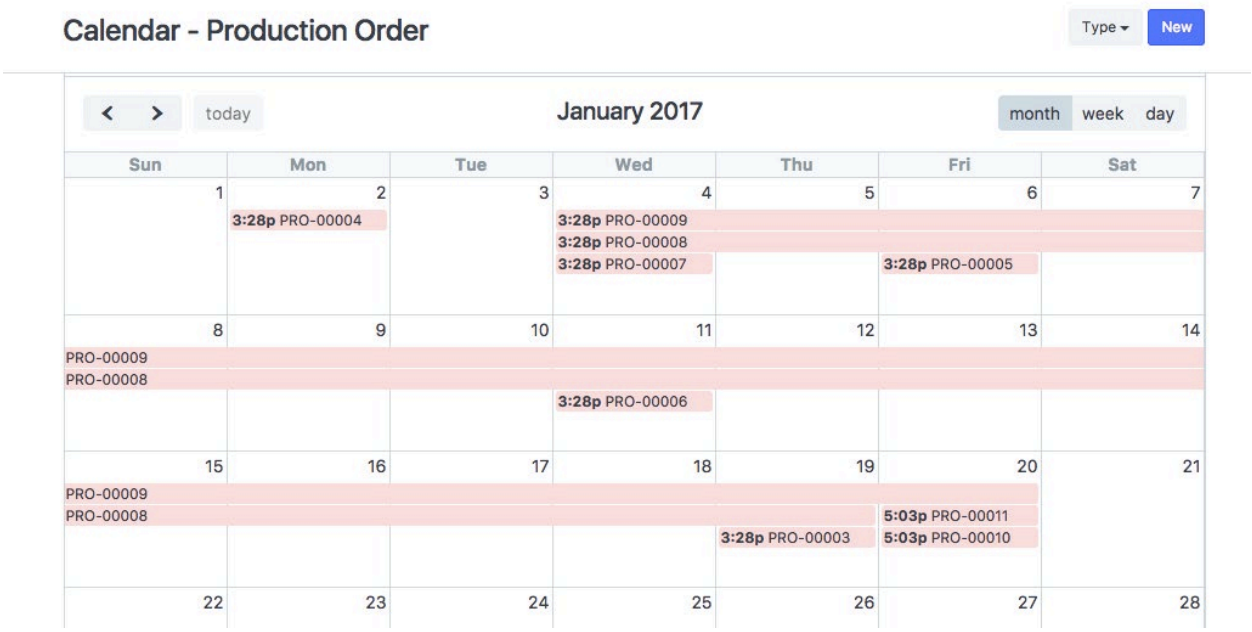
if you need Production Planning Tool to consider raw-materials required for the manufacturing of sub-assembly items selected in the BOM, please check following instructions to achieve the same.

Production Planning Tool has field called "Use Multi-Level BOM", checking which will consider raw-material of sub-assemblies as well in the material planning. If this field is not checked, then it will consider sub-assembly as an item, and won't consider raw-material required for the manufacturing of that sub-assembly.

Use Multi-Level BOM field is also there in the Work Order and Stock Entry. If checked, raw-materials of sub-assembly item will be consumed in the manufacturing process, and not the sub-assembly item itself.

2. Capacity Planning based on Work Order

Capacity Planning functionality helps you in tracking production jobs allocated on each Workstation.



Follow are the steps to use Capacity Planning Feature in your ERP+ account.

1. Operations: To add operations, go to: Manufacturing > Bill of Materials > Operations

2. Workstation: Add each Workstation in your ERP+ account from: Manufacturing > Bill of Materials > Workstation

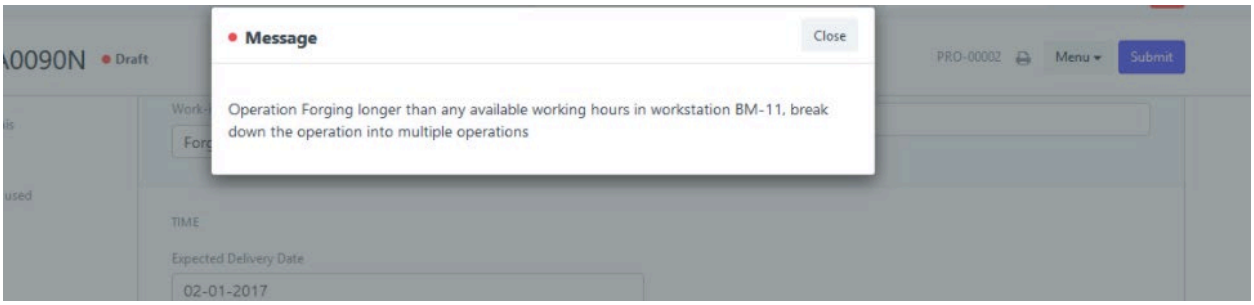
   In the Workstation master, you can define which operations will be performed on it, what are the cost associated with it, and what are the working hours of that Workstation.

3. Bill of Materials (BOM): In a BOM, with the list of raw material needed, for manufacturing, you can also list operation and workstations through which those raw materials will be processed.

4. Work Order: On submission of Work Order, Timesheet for Operations. This helps you allocate production jobs on each Workstation, as well as you can update actual time taken for each Operation.

Error due to Capacity Planning

Question: On Submission of Work Order, we are getting following error message.



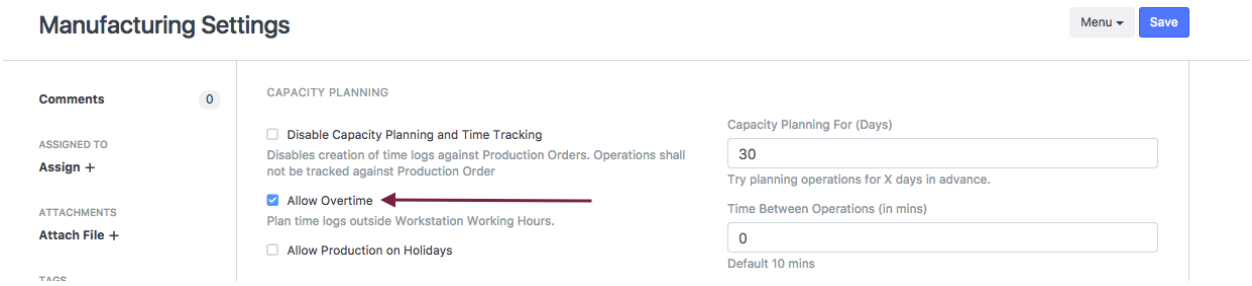
Answer: Please check if you have updated Working Hours in the Workstation master? If not, then please update it and then try to submit Work Order.

On submission of Work Order, Operations (as added in the BOM) are allocated on the workstation. Each operation should start and end on the same day. If a system is not able to schedule that operation in a day, then system request you to divide that Project, so that system can allocate smaller operations in a day.

If you have update working hours in the Workstation, but still getting this issue, that because one of your operation is taking too long, and cannot be completed in a day. Please divide that operation into smaller operations, so that it can be allocated on Workstation and completed on the same day.

Avoid Working Hours of Workstation

If you want to ignore above validation and allow scheduling of production job beyond the working hours of the Workstation, enable Overtime in the Manufacturing Settings.



If you want to complete disable Capacity Planning feature, in the Manufacturing Settings, check field "Disable Capacity Planning and Time Tracking".

3. Open Work Order Report

We can easily identify the progress of manufacturing of certain items in our organizations using Open Work Orders in ERP+.

In this report, users are able to see what items need to be produced, total quantity to be produced and also any produced items before. To further detail, users can proceed to click on the work order e.g.; MFG-WO-2018-00005.

With this report, we are able to know what items to be produced, in this report qty to manufacture is 2.

The important information is the warehouses which warehouses to store our in-progress items and the finished manufactured items. This should enable us to track our stocks inventory and translate to efficiency in costing.

We can prepare our manufacturing in mannerly order based on the required items in source warehouse where the items been stored. See figure 3.

Manufacturing operations Certain items required certain manufacturing processes and steps. The open work orders will be able to tell us the manufacturing steps and their status if done or not yet done. It definitely will help in organizing the jobs in better way.

This report is helping to calculate the operation cost required in the manufacturing. This is to give us certain information required to make the business decision. See below for more details.

2.2 Article: Bill of Materials (BoM)

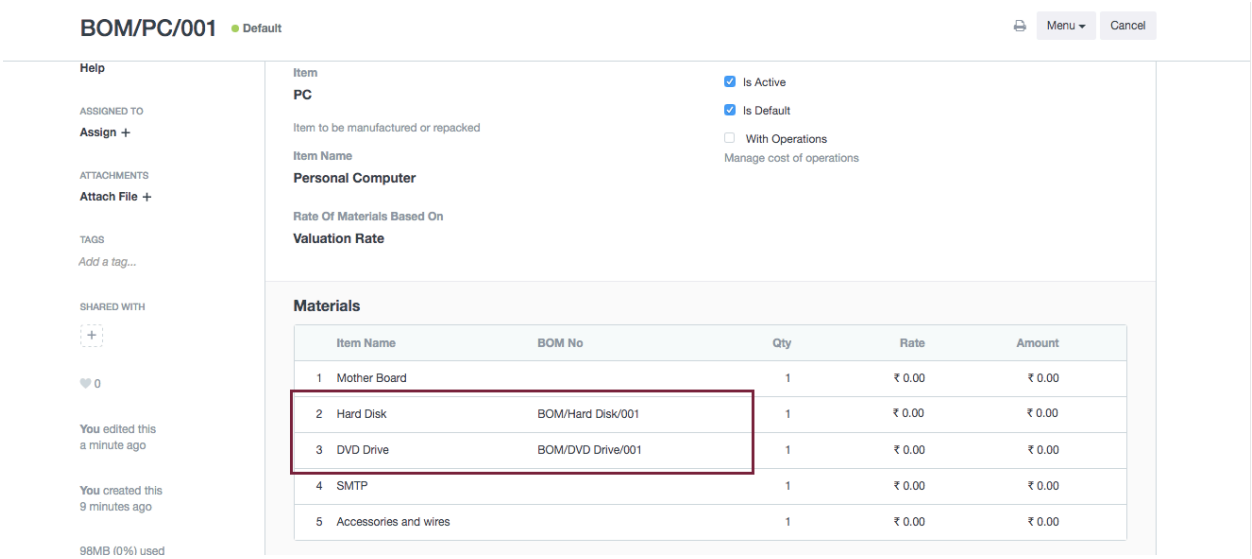
1. Nested BoM Structure
2. Valuation Based on Field In BoM

1. Nested BOM Structure

Question: Our manufacturing process involves producing sub-assembly items before final product. How should we manage BOM master in this scenario?

Answer: You should create BOM for item in the order of their production. BOM for the sub-assembly item should be created first. BOM for the Product Order item should be created last. Let's consider an example to understand this better.

A computer assembler is creating a BOM for PC. They also manufacture Hard Disk and DVD Drive themselves. They should first create BOM for Hard Disk and DVD Drive. After that BOM for the PC should be created. BOM of PC will have all the raw-material items selected in it. Hard Disk and DVD Drive (sub-assemblies) will also be selected as raw-material items. For the sib-assembly items, respective BOM no. will be fetched as well.



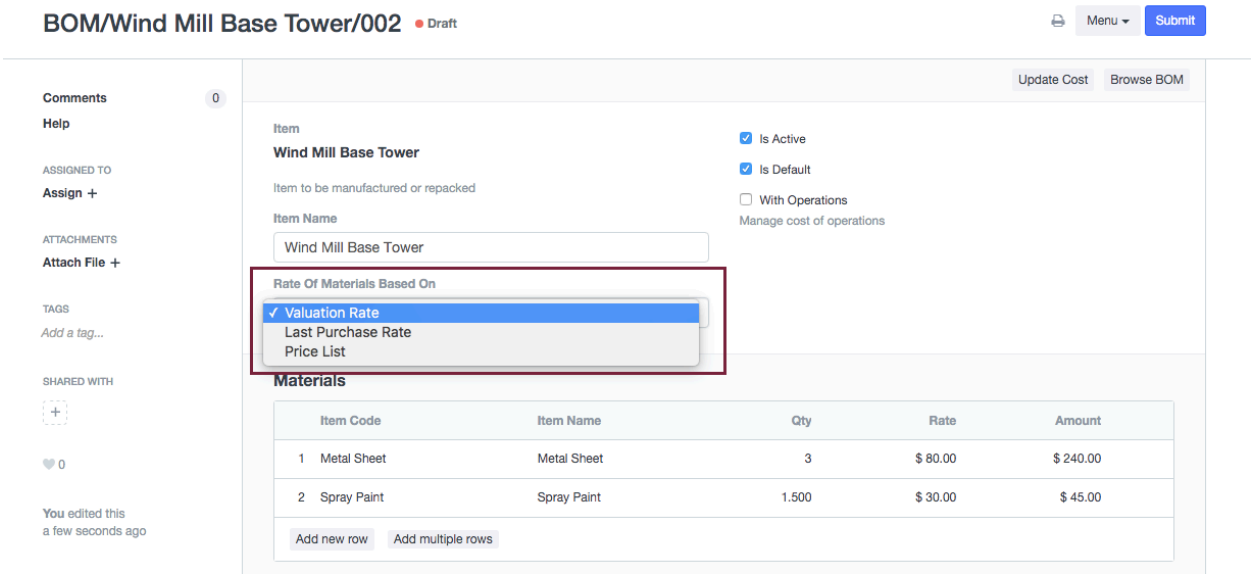
Following is how the structure of nested BOM will look:

-Personal Computer (FG Item)
---- Mother Board
---- SMTP
---- Accessories and wires
----Hard Disk (sub-assembly)
------- Item A
------- Item B
------- Item C
----DVD Drive (sub-assembly)
------- Item X
------- Item Y
------- Item Z

2. Valuation Based On in BOM

Question: What are for various options in Valuation Based on in the Bill of Materials (BOM)?

Answer: There are 3 available options in the *Valuation Based On* field:



Valuation Rate: Item valuation rate is defined based on its purchase or manufacture value.

For Purchase Item, it is defined based on charges entered in the Purchase Receipt. If you don't have any Purchase Receipt made for an item or a Stock Reconciliation, then there won't be any Valuation Rate for that item.

Price List Rate: This option allows to pull item rates from Price List.

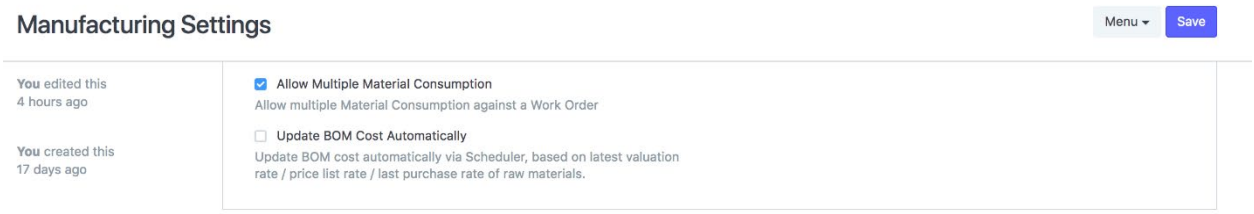
Last Purchase Rate: It will be the last Purchase (Order) Rate of an item.

2.3 Article: Others

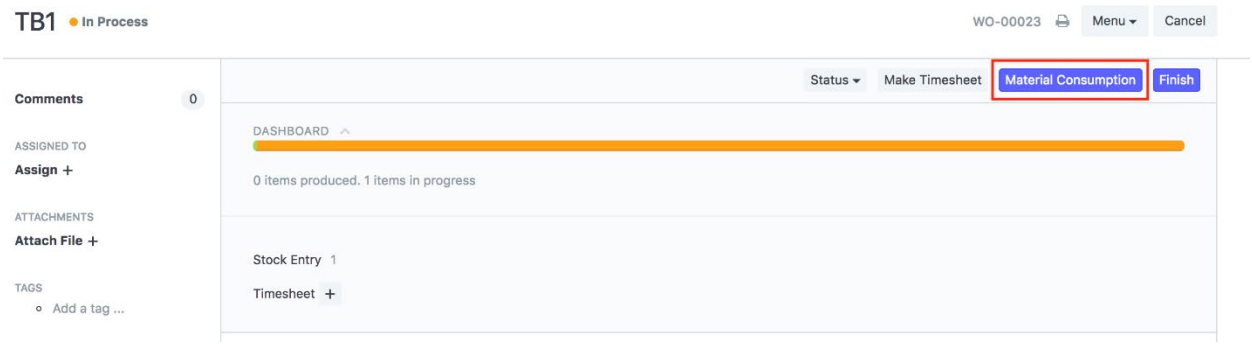
1. Material Consumption
2. Customer Provided Items
3. Scrap Management

1. Material consumption

Material Consumption functionality allows you to have multiple consumption Stock Entry against a Work Order. To enable this, go to Manufacturing > Manufacturing Settings.

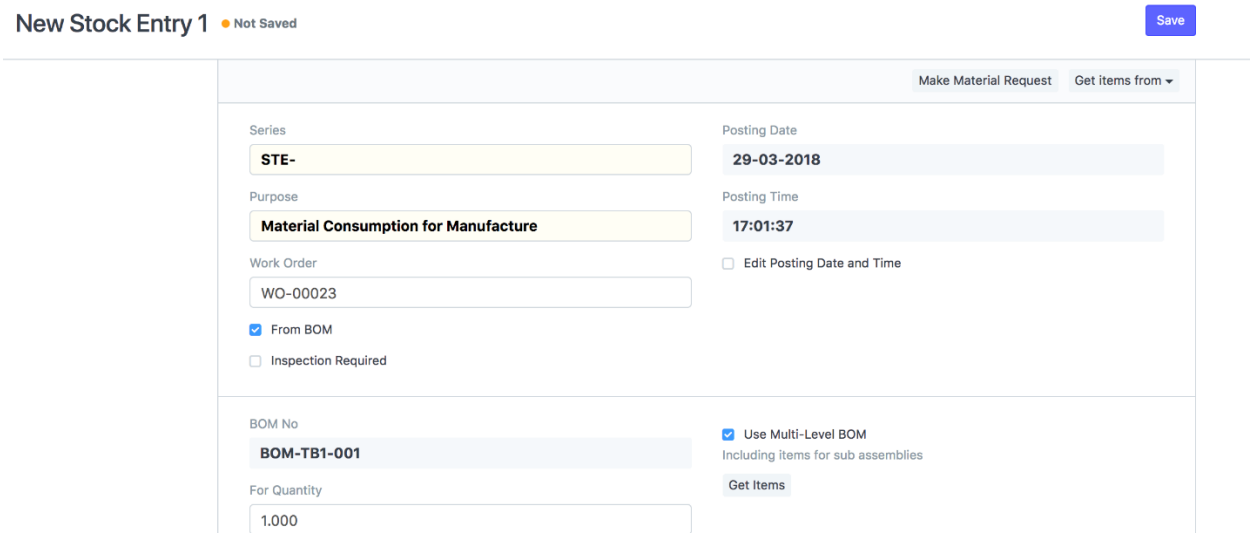


Once enabled, a Material Consumption button will be available in Work Order once started.

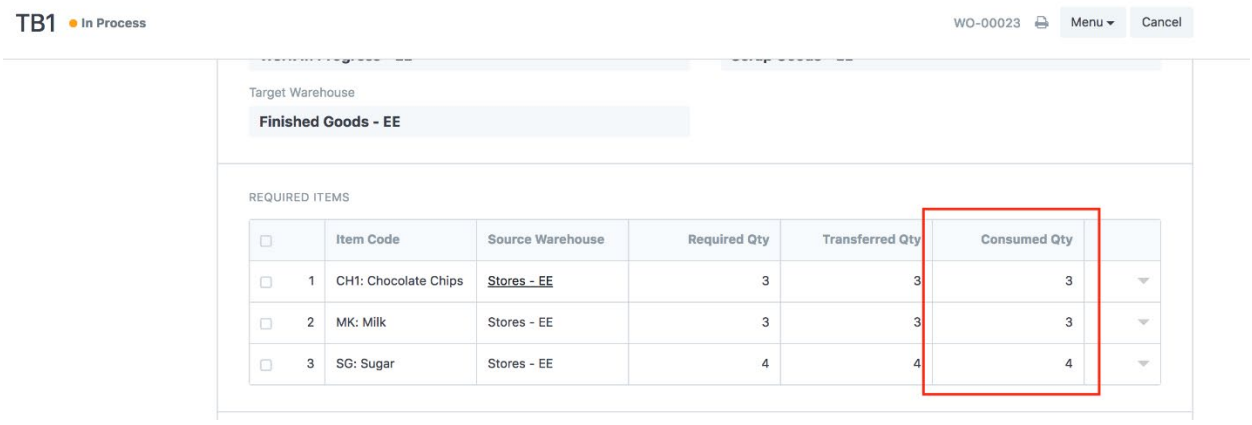


When button is clicked, it will do the following:

1. It will create Stock Entry with purpose Material Consumption for Manufacture.



1. If the "Backflush Raw Materials Based On" in the Manufacturing Settings is set to BOM, if will propose to consume all required qty for manufacture.
2. If the "Backflush Raw Materials Based On" in the Manufacturing Settings is set to Material Transferred for Manufacture, if will propose to consume all transferred qty for manufacture.
3. Once submitted, it will update Consumed Qty column in the Work Order.



1. In succeeding Material Consumption, it will suggest unconsumed qty.
2. Once "Finish" button is clicked in Work Order, it will take into account consumed qty.

Validations

- If "Allow Multiple Material Consumption" is not set in Manufacturing Settings but "Material Consumption for Manufacture" is use in Stock Entry.

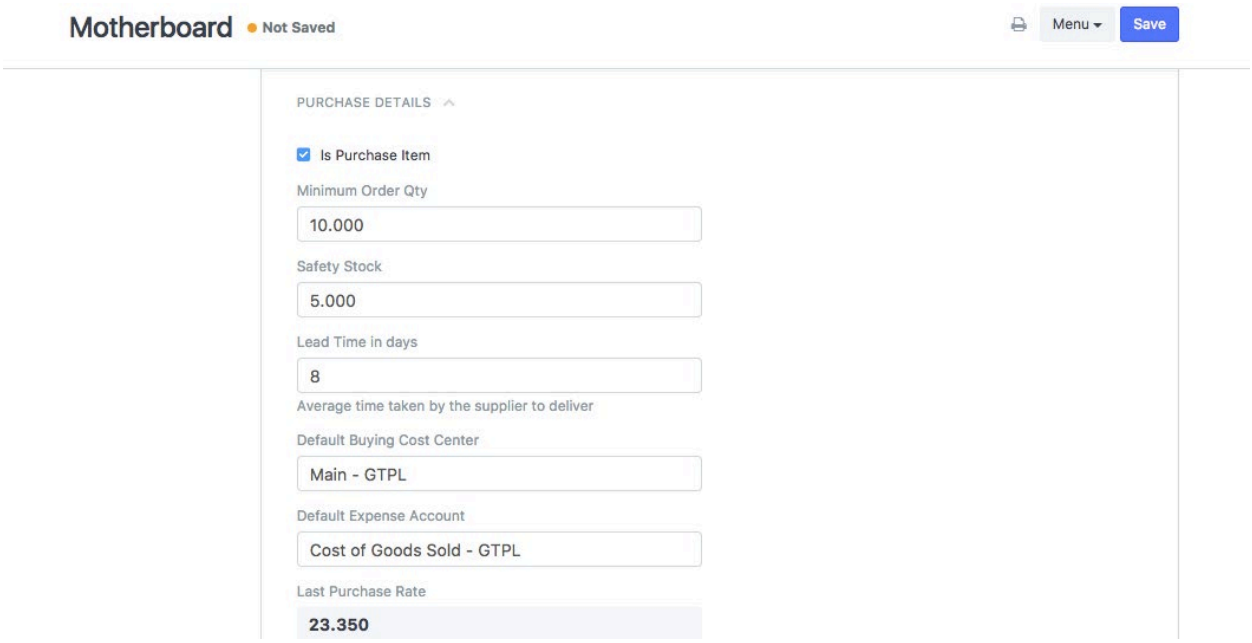
- Cannot cancel "Material Consumption for Manufacture" for completed Work Order.

2. Customer Provided Items

In Contract Manufacturing, in some cases Customer provides specific items as one or few of the BOM components. These items cannot be received using a Buying Cycle since that will mean making Customer as a Supplier at the same time and it will go through each doctype in the cycle.

In this feature, Customer Provided Item is received through Stock Entry from a Material Request with type Customer provided. Here are the steps on how to setup a Customer Provided item.

1. Got to Item Doctype and add a new Customer Provided item. Stock > Item >
2. In the Purchase, Replenishment Details section, check Is Customer Provided and set a default Customer.



How to receive a Customer Provided Items?

1. If Production Plan is used, Material Request for this item can be auto created.
2. Once a component in a BOM is set as Customer Provided and Material Request is created from Production Plan, it will create both Material Request with type Purchase and Customer Provided. From there, a Stock Entry with purpose Material Receipt can be created.
3. A Material Request can have multiple Stock Entry - Material Receipt. It will reflect it in the status.
4. Customer will be able to track their Material Requests in a Web Portal Material Requests. The portal is filtered to show only the Material Request of the customer.

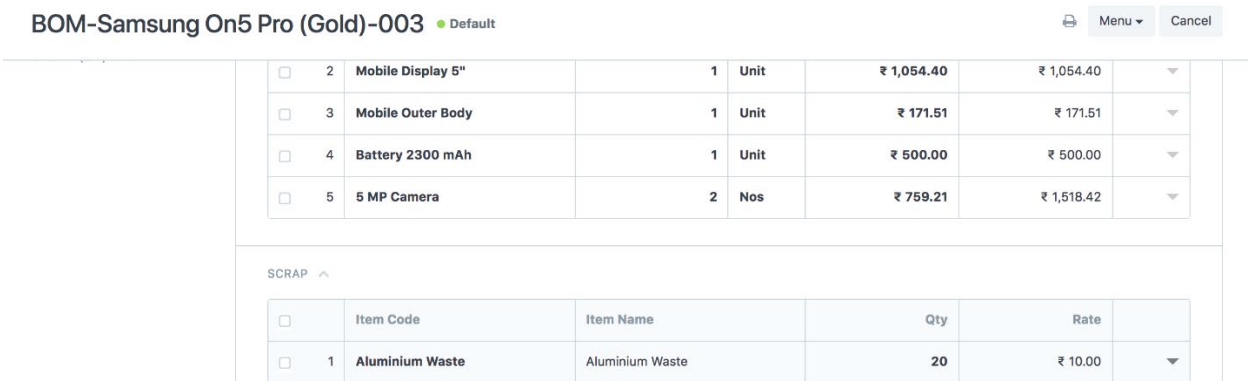
3. Production Scrap Management

Scrap means waste that either has no economic value or only the value of its basic material content recoverable through recycling.

Scrap is generally availed at the end of the manufacture process. Also, you can find some products that are damaged or that are unusable due to expiry or for some other reason, which needs to be scrapped. In ERP+, at the end of manufacturing process, scrap items are accounted in the scrap warehouse.

Scrap in Bill of Materials

You can update estimated scrap quantity of an item in the BOM, Scrap table. If required, you can reselect a raw-material item as scrap.



Scrap in Manufacture Entry

When production is completed, Finish / Manufacture Entry is created against a Production Order. In this entry, scrap item is fetched in the Item table, with only Target Warehouse updated for it. Ensure that Valuation Rate is updated for this item for the accounts posting purposes.

Scrap from the BOM will only work if Manufacture Entry is created based on BOM, and not based on Material Transfer. This is configurable from Manufacturing Settings.