Manufacturing with ERPNext

Learn how ERPNext can help digitize your manufacturing business

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Manufacturing with ERPNext

Deploy ERPNext to run a smooth manufacturing line

Executive Summary

The manufacturing industry has its various challenges, choosing an ERP software shouldn't be one of them. In this document, we talk about ERPNext and how it can be a good fit to run your manufacturing company. First, we explore the types of manufacturing practices that are widely used in this industry. Next, we talk about some common challenges in the manufacturing sector and then deep dive into ERPNext. We will explore how ERPNext is a robust and cost-effective ERP while also being a complete solution to record most of your business processes.

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Background

So you've set out and started a manufacturing company. Let's call it Frappe Furniture. As a company that manufactures various types of furniture, you need to record details of the process and a spreadsheet won't cut it. So you start looking for an integrated solution. There are various options available, gluing different SaaS applications might not be a good idea since manufacturing data needs to be closely knit in the system with inventory and other areas. Only then you can get reliable reports and forecasts to plan and maintain a seamless manufacturing line.

1. Types of manufacturing

Broadly, there are three types of manufacturing carried across manufacturing industries. They are:

1. Make to stock
2. Make to order
3. Engineer to order

The manufacturing method depends on the type of products that your company manufactures. But first, let's take a look at each of these to understand what they are.

1.1 Make to stock

Make to stock is a method in which products are mass-produced and stored in warehouses. This is the most common type of manufacturing method where the produced stock is either sent out to distributors or sold to customers (other businesses). For example, fast moving consumer goods (FMCG) products, clothes, furniture, etc. A standard bill of materials (BOM) is used as a recipe to manufacture items and maintain the stock levels. Hence the term make to

stock. The stock to be manufactured in advance is generally projected based on demand forecasting.

1.2 Make to Order

In this method, items are manufactured only when the company receives an order. This is often done in high value or specialized items where there is no large consumer market and selling them takes a long time. For example, specialized machinery equipment or parts but the BOM remains the same for every product. Since the manufacturing happens only when a sales order is received, hence it's called make to order.

1.3 Engineer to Order

This goes one step further where the item is produced based on custom requirements specified by the buyer, which means that each product is unique. Usually, these items are not mass-produced, for example, furniture with custom dimensions or materials. For each order, the specifications are different and a different BOM is created, hence engineer to order.

2. Common challenges

Now, you may face multiple challenges in day-to-day manufacturing, we don't understand them 100% and won't pretend to. But we do understand the operational challenges that come with managing your daily operations digitally.

2.1 Poor efficiency

Some factors that lead to poor efficiency are as follows:

- Handwritten job cards and spreadsheets are slow.
- Lack of production planning can lead to over-purchase or stock-outs.

- Lack of methods to track the production progress.
- Underutilization of manufacturing resources (like machine and resource idle time). Pilferage or misplaced goods during transit, lack of systems to verify these.

Poor efficiency causes things like delayed deliveries to customers.

2.2 Lack of software systems

For a manufacturing business, be it SMB or an enterprise, the need for a complete ERP solution is inevitable. It happens so that everything from procurement to production planning to inventory management to sales needs to be recorded digitally. The challenge here is that most cheaper solutions in the market often do not have a manufacturing module and the ones that do lack features in other domains like HR, for example. This limits such systems from being used as a complete ERP solution.

ERPNext is in a unique position where it's affordable and feature-rich in manufacturing and other domains. This makes it suitable for businesses that are starting out as well as enterprises that have been around for a while. The saved costs can be channeled to maximize the efficiency of your manufacturing business.

As mentioned earlier, a manufacturing business needs ERP modules for domains way beyond manufacturing. These are:

1. Raw material procurement from suppliers
2. Inventory management of raw materials
3. Bill of materials and work orders
4. Warehouse management for finished goods
5. Project management for manufacturing in bulk
6. Sales orders from customers
7. Accounting for bookkeeping

8. Human resources for employee management

3. Manufacturing in ERPNext

ERPNext provides all the features you need to maintain an efficient manufacturing line. A robust ERP solution like ERPNext offers multiple features to manage your sales, inventory, employees, accounts, projects, and more!.

3.1 An overview of features

With ERPNext you can handle all of the above scenarios. ERPNext covers all conventional/standard manufacturing features like:

1. Bill of materials (BOM)
2. Production Plans
3. Work Orders
4. BOM Comparison and replacement
5. Operations
6. Workstations
7. Routings for Work Order automation
8. Reports
9. Job cards
10. Capacity Planning
11. Scrap Management

Typically, the manufacturing flow in ERPNext looks like this:

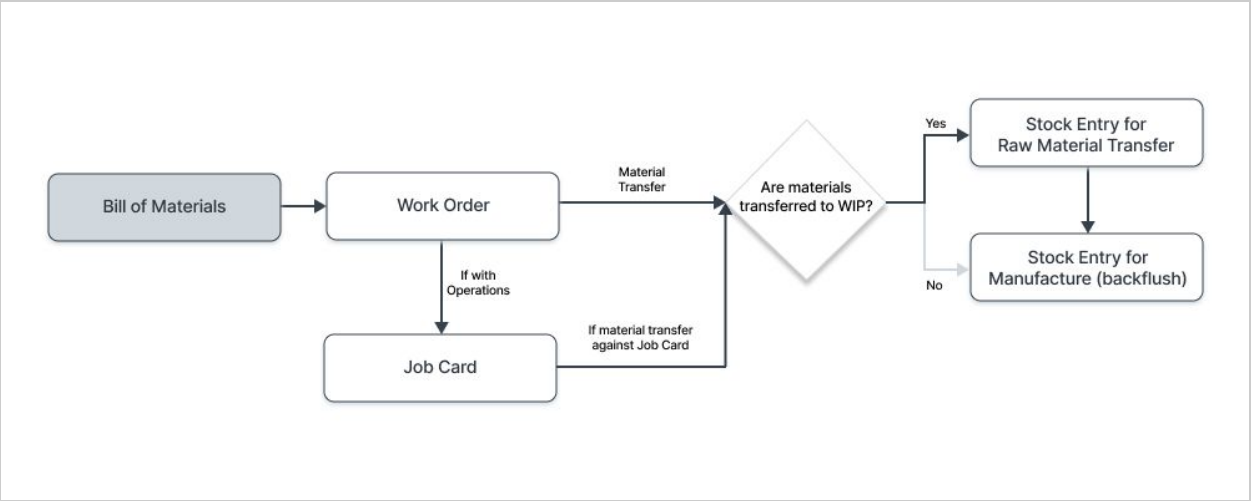

Figure 10: Manufacturing flow in ERPNext

To learn more about manufacturing features in ERPNext, visit the web page and the documentation.

Now let's see an overview of how the different manufacturing techniques can be managed in ERPNext.

After having your items recorded, the first step, the blueprint, the foundation is the Bill of Materials (BOM). Once submitted, a BOM cannot be changed in ERPNext but you can update costs as per the valuation of the item at any point in time. BOMs can be multilevel and with or without operations. This is an example print view of a BOM in ERPNext:

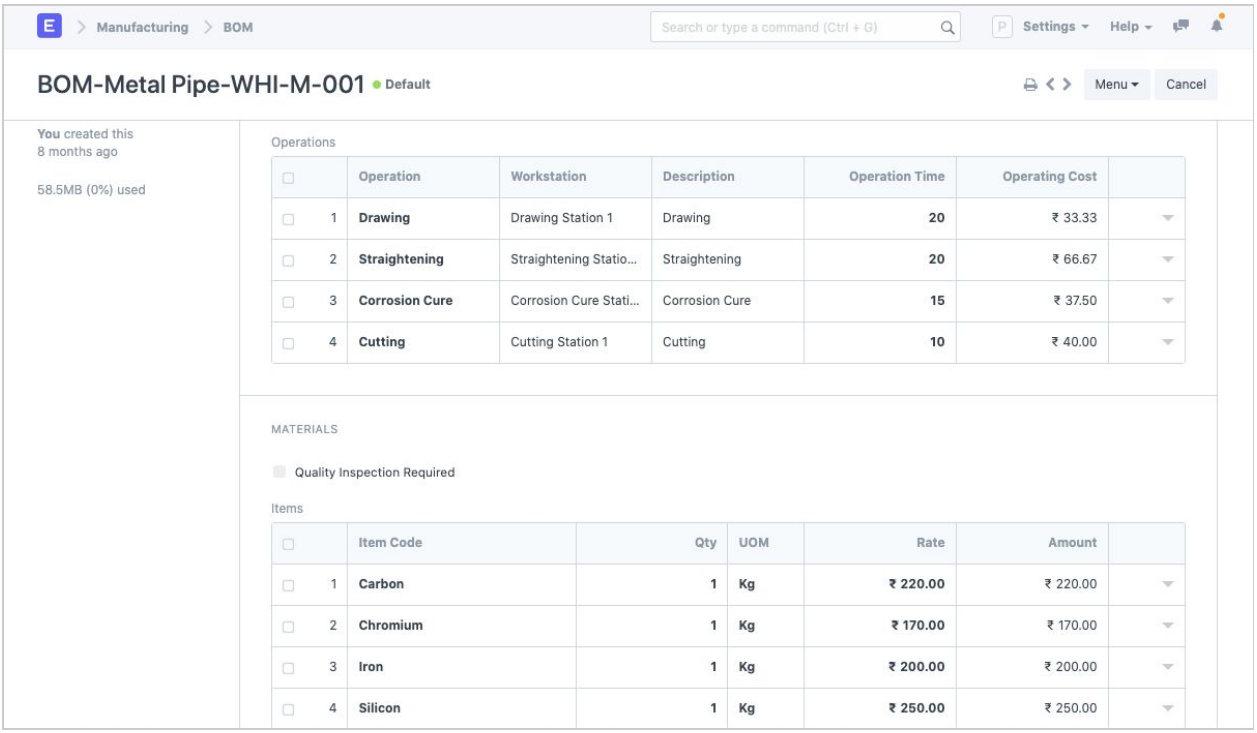

Figure 2: BOM metal pipes

As you can see in the screenshot, the first table shows the various operations to be performed for manufacturing the product. The second table shows the raw materials used for manufacturing the pipes.

3.1.1 Make to stock

For make to stock, you can configure settings in the item and module levels to notify and even automatically create material requests so your inventory doesn't stock out.

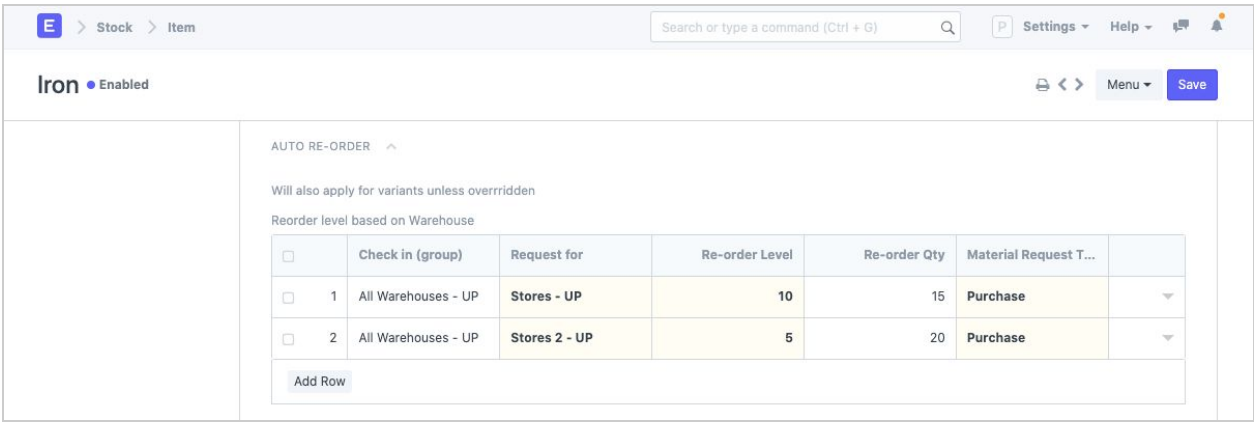

Figure 3: Item reorder in ERPNext

3.1.2 Make to order

For this type, the BOM will be the same with operations but the options to maintain and replenish stock need to be disabled. The manufacturing process i.e., production planning and work orders will start only after you confirm the sales order. In cases where you know that your customer is going to order a fixed quantity at fixed intervals, using the Blanket Order is viable.

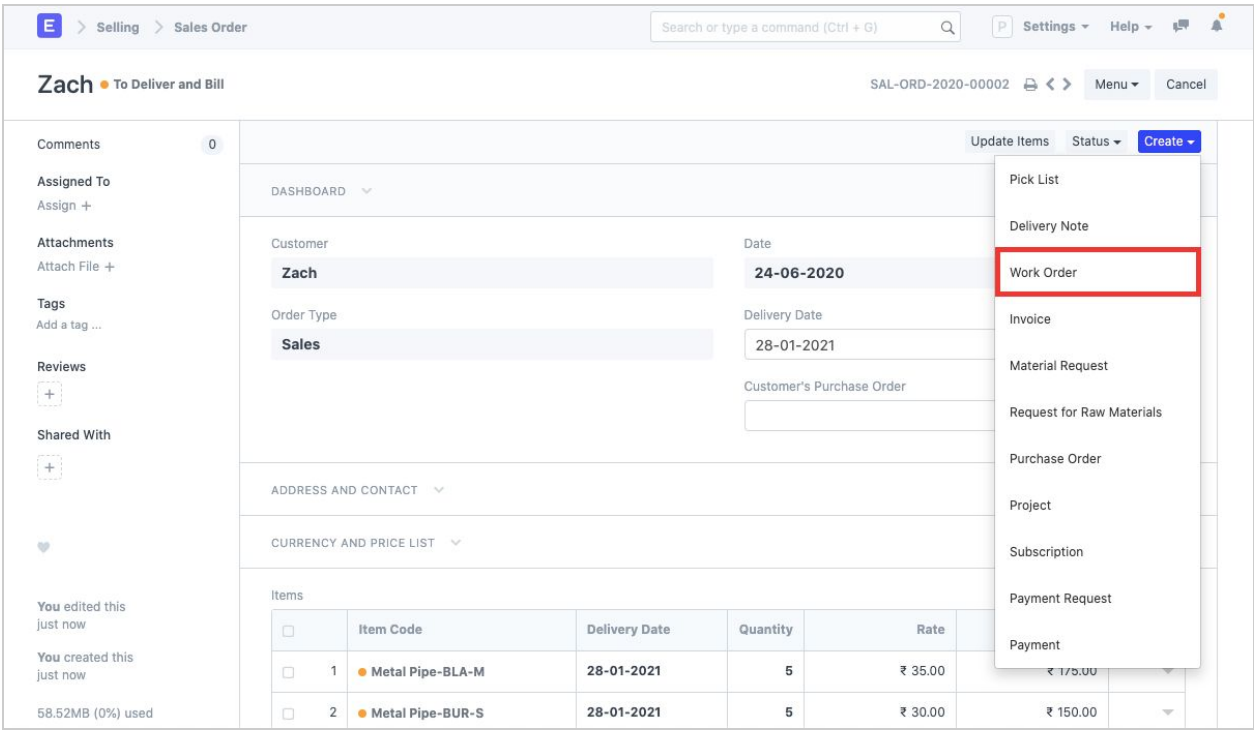

Figure 4: Work order (job order) from a sales order

3.1.3 Engineer to order

A new BOM should be created for every item ‘engineered to order’. We understand that with these types of orders, the measurements and materials can be wildly different with each order. To handle this, ERPNext has multiple different units of measure (UoM). You can also create your own UoMs and set up conversion factors between them. And the leftovers can be handled using scrap management.

In all the three manufacturing methods, there is a possibility that one or more raw materials are unavailable. In those cases, a different item can be used in place of an item as a replacement. We call this Item Alternative in ERPNext and it’s a common practice in many manufacturing industries.

A work order captures details about the required items, operations, and job cards which contain information about the time taken for every operation defined in the BOM. The work

order also stores details about operating costs so that you can send a proper invoice to your customer when the manufacturing process is finished.

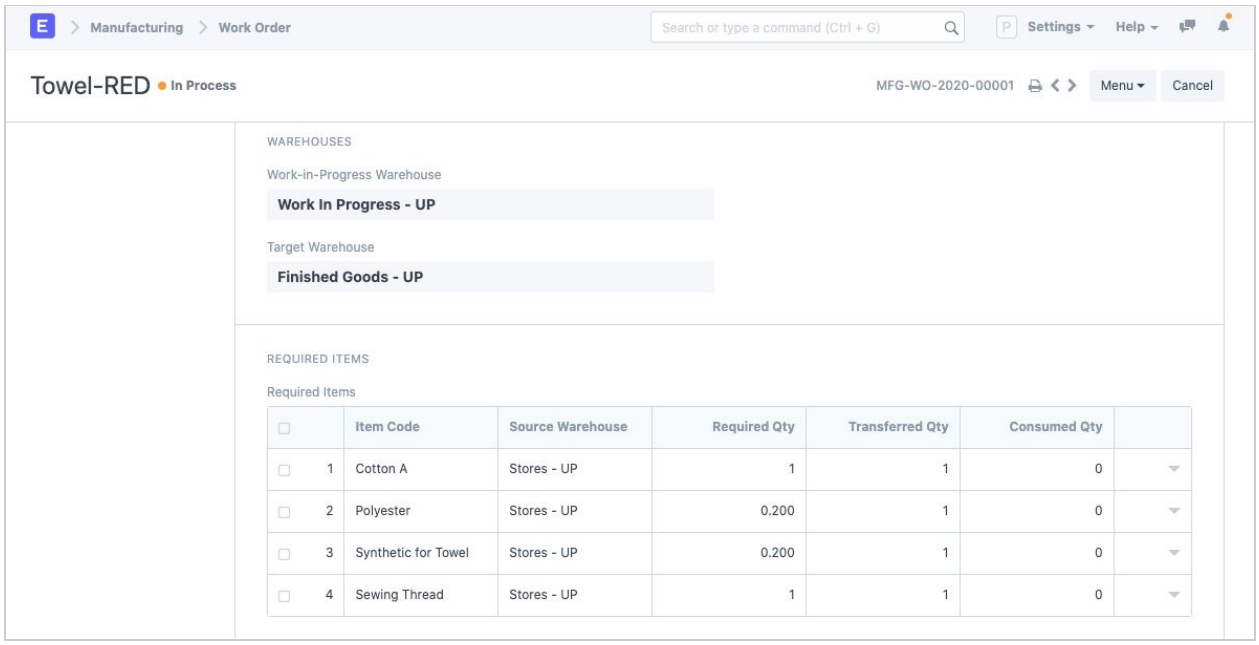

Figure 5: Work Order in ERPNext

3.2 Some advanced features

Specific to manufacturing, ERPNext has some advanced features that help you save time and automate many activities.

- Material requirements planning:

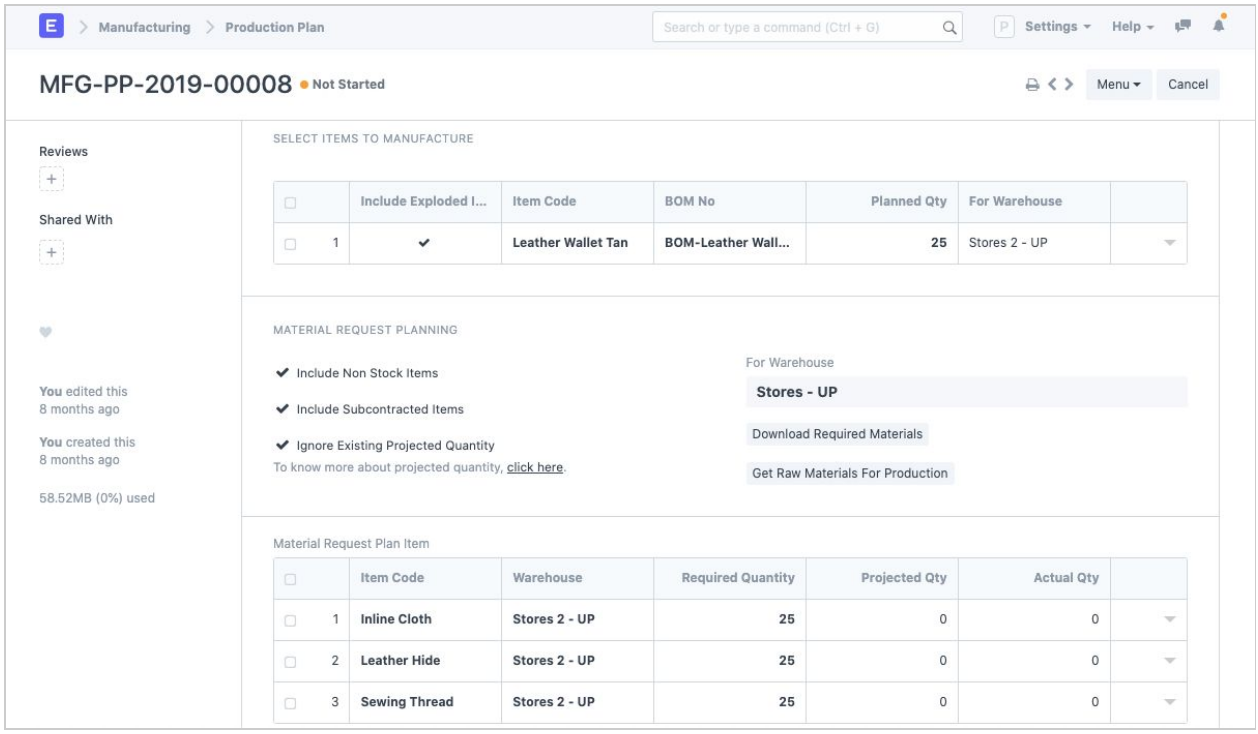

Figure 6: Production plan in ERPNext

- Shop floor kanban to view manufacturing orders:

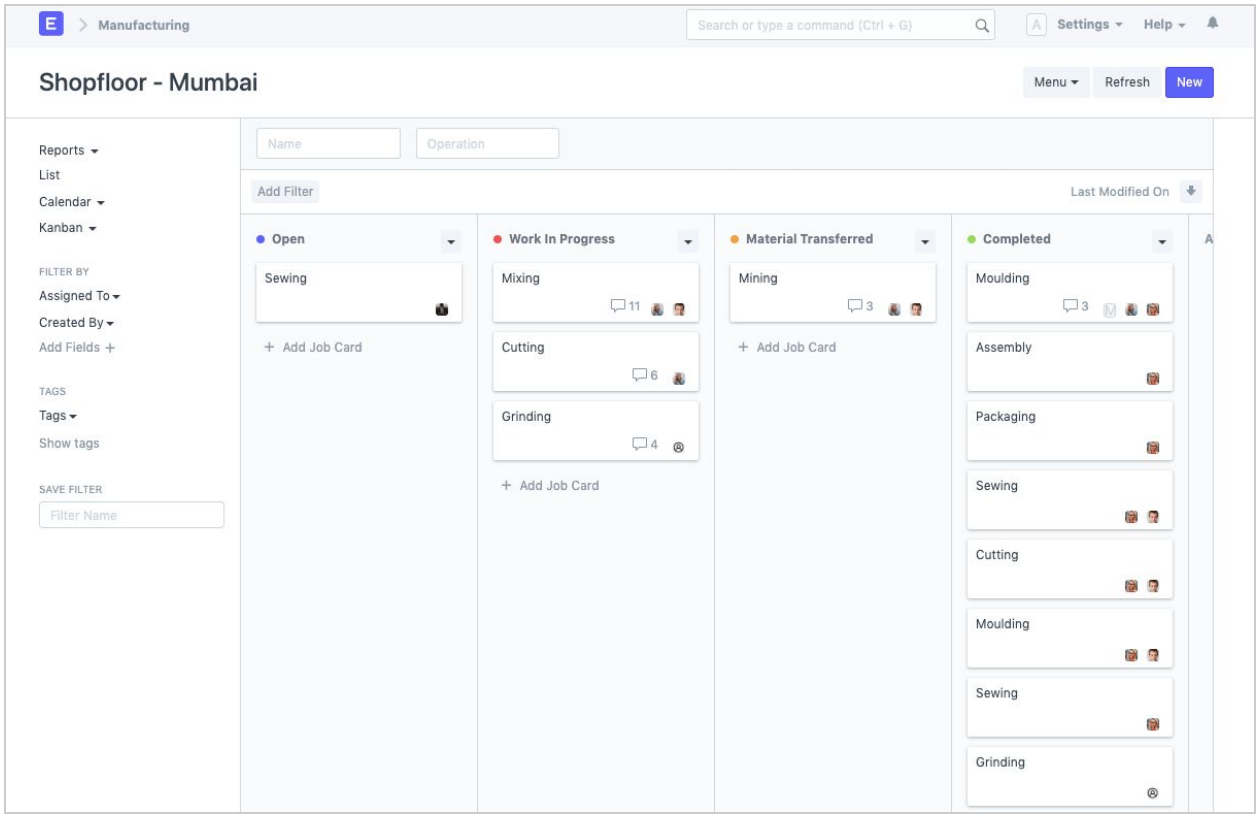

Figure 7: Kanban view in ERPNext

- Capacity planning

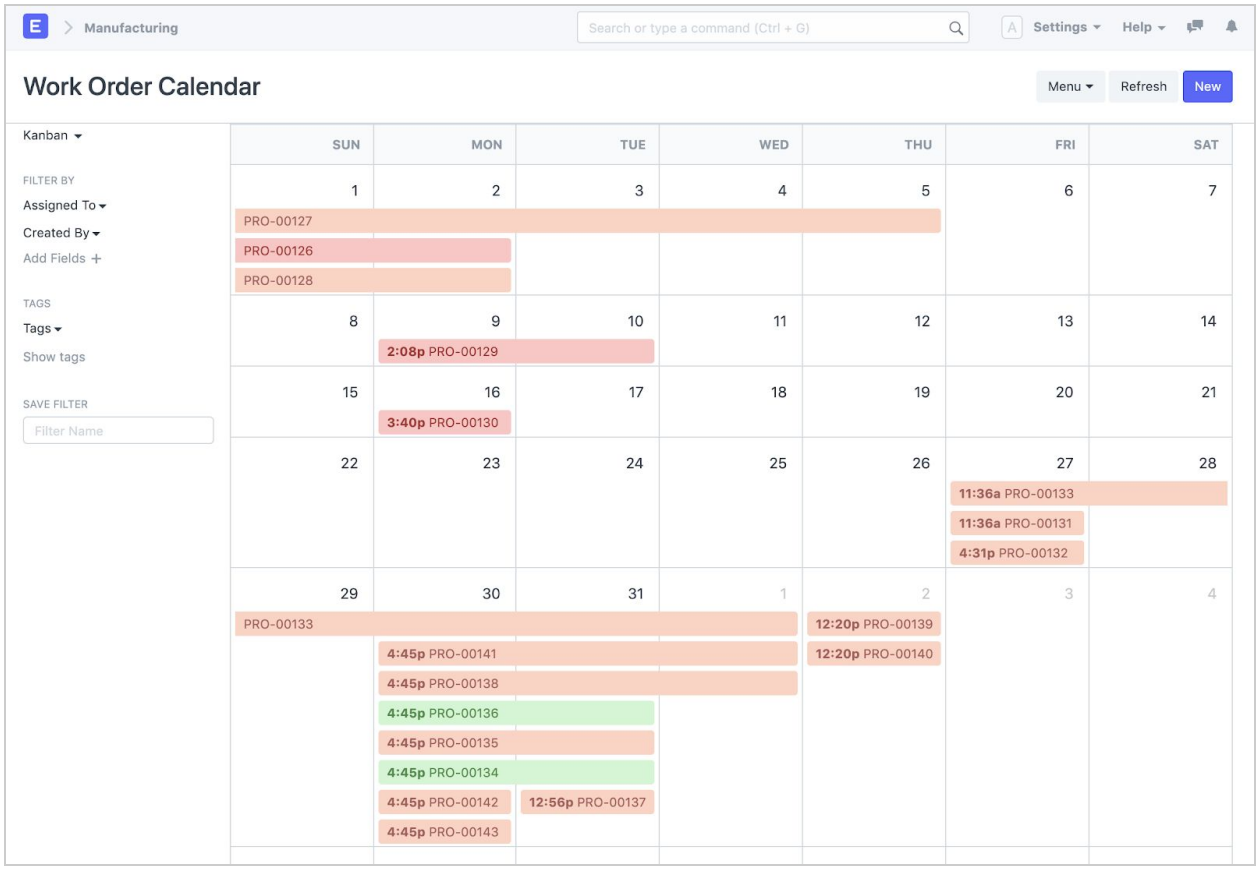

Figure 8: Capacity planning in ERPNext

- Subcontracting

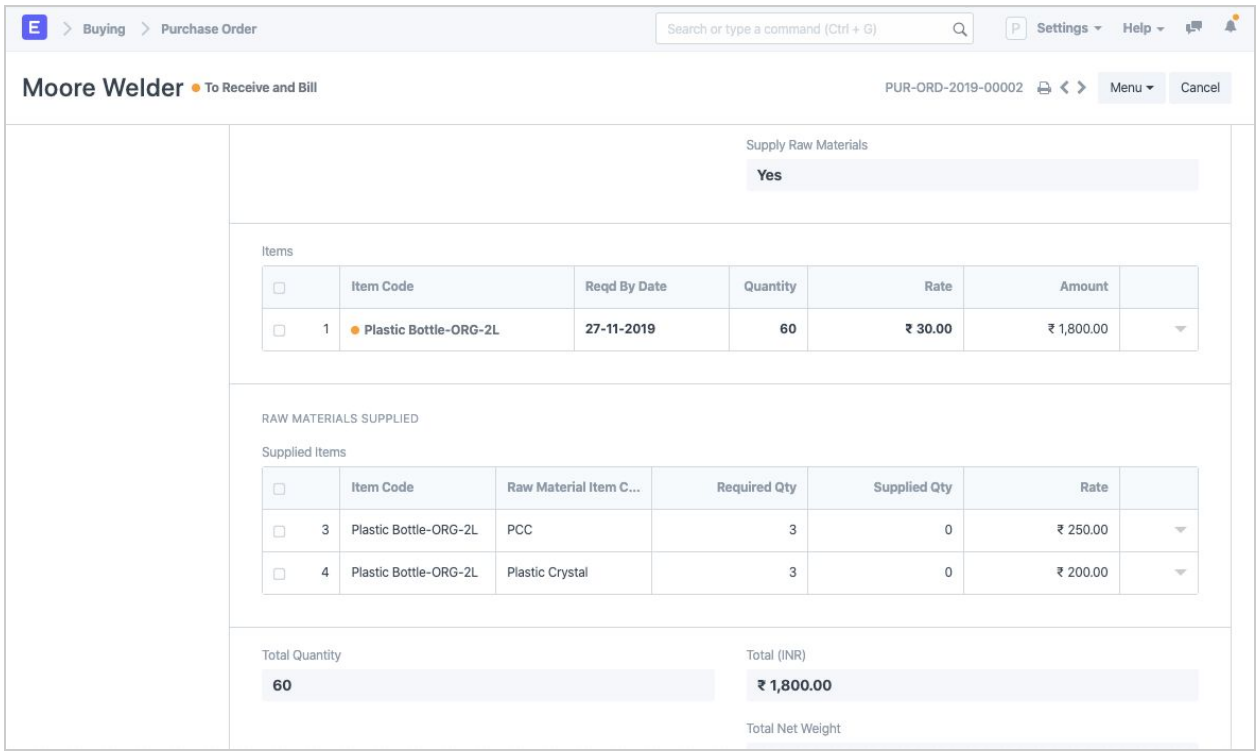

Figure 9: Subcontracting in ERPNext

- Different BOMs for different variants of one item.
- Time tracking for accurate cost calculation.
- Item alternative to use as replacement items in manufacturing when the main item is not available.
- Product bundles.
- Automatic Job Cards.
- Job card timer.

3.3 More than manufacturing

3.3.1 Increase Sales

List your products on the Website effortlessly by enabling the shopping cart. You can also create web pages to showcase your company and products/services.

The CRM module in ERPNext allows collecting leads, contacts, and recording relevant details and email threads in one place so all CRM data is easily accessible. Run campaigns, carry out email marketing by sending newsletters and build your lead list. Then the next steps are to qualify opportunities, send quotations, and close manufacturing orders.

3.3.2 Retain Customers

After acquiring, retaining customers/distributors is a whole different challenge. ERPNext has a few tools like the support module where your customers can raise issue tickets and access them via the Customer portal for updates. By offering tight service level agreements you can keep the customers loyal. Another tool in ERPNext to keep the customers is a Loyalty Program.

3.3.3 Save money and time

ERPNext is budget friendlier than most ERPs since it's open-source and there's no licensing involved. Sport a simple UI, fewer clicks to get tasks, and manufacturing actions done. Small nifty features and UX standards save a lot of time when using ERPNext on the shop floor. No vendor lock-in is an added bonus that lets you select a service provider of your choice. More importantly, **your data** is yours to access, delete, or take with you.

Features like production plan, scheduling, and capacity planningsave your time by automating some parts of the workflow.

3.3.4 Customization

If the existing arrangement of features doesn't let you proceed confidently, you can create your own forms and scripts to create your own version of manufacturing software in ERPNext. Create new forms, scripts, fields, and workflows all with minimal or no coding required. Moreover, if your business requires some core feature changes, you can get in touch with the Frappe team.

4. Customer Talk

“Neat and responsive UI, well designed, easy to use ERP, and surprisingly easy to customize. The Frappe framework makes it easily customizable. Great for manufacturing with multi-level BOMs, managing multiple production departments, and no vendor lock-in, the software is 100% open-source. It provides great security to small scale businesses. Community driven and transparent approach to development. Better purchase, inventory, and production management. Better interoperability between different departments—Sales, Accounts, and Production. More importantly better adherence standard BOMs.”

- Dhananjay Palshikar, Manager (R&D) at Sapcon Instruments

Conclusion

We saw an overview of the types of manufacturing in the industry. Then we talked about a few challenges in manufacturing relevant to software. Using a good manufacturing software solution increases efficiency and records all data in one database. Then we saw ERPNext's manufacturing module, some basic features, some advanced, and also covered features beyond manufacturing.

ERPNext is a complete solution that allows configurations beyond manufacturing to increase your overall sales and manufacturing efficiency.

Credits

This document is based on experience by the team at Frappe Technologies which has performed and overseen over 850 ERPNext implementations across the span of 10 years. We would like to acknowledge the hundreds of companies that chose Frappe to kickstart their ERPNext implementation.

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