



2023 Project Management eBook for Manufacturing

by  ProjectManager

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An introduction to manufacturing

The manufacturing process is often taken for granted, but not by manufacturers. They understand the time and effort that goes into completing both simple and complex projects.

This eBook outlines the essential information about manufacturing project management and the tools and techniques that you can use to plan, coordinate and execute your established goals on time and within budget.

What is manufacturing?

Let's start with a simple definition. Manufacturing is the making of goods by hand or by machine that when completed, the business sells to a customer. This is accomplished through human labor, the use of machinery and/or other tools and often a biological or chemical process. **Manufacturing projects** can be both small and large; from making the small components of an airplane to assembling the plane itself, manufacturing is an all-encompassing process.

During the manufacturing process, these raw materials are modified to deliver the finished goods. There isn't one sole universal manufacturing process to take you from beginning to end. In fact, there are many including job shop manufacturing, repetitive manufacturing, continuous process manufacturing, etc. Some processes are intermediate and make components that undergo another manufacturing process to build the finished product.

From jet engines to cereal boxes, products derived from manufacturers are all around us. Let's dig into the different facets of manufacturing and what you need to know about them. First, take advantage of our free templates below.

Templates

Manufacturing projects are nothing if not complicated. Regardless of the end product that you're producing, using pre-built templates is an easy way to jumpstart your manufacturing initiatives while maintaining quality. ProjectManager offers dynamic templates that are usable in Excel, Word and directly within our software. [Click here to see all of our free templates.](#) We've compiled our relevant templates for manufacturing teams below.



Project plan template



Issue tracking template



Resource plan template



Product launch template



Project status report template



Product development template



The manufacturing process



The manufacturing process

While there are many manufacturing processes, they must all follow a shared path from idea to finished product. What are the steps that take an idea and turn it into a reality? It's not an easy trip, but these eight steps help make it possible.



Develop the product vision

The **product vision** is the seed from which the finished goods will grow. Even if you don't have an idea, you can develop one by brainstorming with your team. Things you'll want to discuss include:

- ✓ Who is the target audience?
- ✓ What size is the market?
- ✓ Is there a need for the product or does it solve a problem?
- ✓ Are there competitors and, if so, who are they?
- ✓ Are there trends around similar products?
- ✓ Do you have the funding necessary to make the product?
- ✓ What's your product roadmap?



Research the vision

Once you have a product vision, you need to do some in-depth research before devoting the time and money necessary to manufacture your product. Part of the research is exploring the questions asked in the first step. For example, if there's a product on the market that will compete with yours, ask yourself:

- ✓ Is my product better?
- ✓ Will consumers have a different experience with your product over the competition?
- ✓ How does your product improve what is already available?
- ✓ How do you intend to market your product?
- ✓ Should you use contract manufacturing?



Design the product

With the idea and the research behind you, next is product development. Always prioritize the end user's needs and make sure your product is user-friendly. Keep in mind the function of your product, what resources are needed to produce it and its lifespan. Along those lines, consider if you'll have a warranty and whether or not it will need accessories or batteries. Don't forget about designing the packaging with the end user in mind, too.



Finalize the design

Once you've answered the questions in the previous step, you can begin to create a final design. At this point, there can't be any gray areas. If you still have questions or user stories that haven't been fully answered, then it's here where you'll need to come up with concrete answers to them. At this point, you'll also need to **compile the resources** necessary for manufacturing your project.



Test the prototype

Before you can manufacture the product at scale, you need to test your prototype to make sure it works and meets the needs of your target audience. Be thorough in this step as the worst thing is having to stop production to fix an issue that you could have resolved during the test stage.



Manufacture the product

Once testing has been completed to your satisfaction, you can begin to manufacture the product. This is when you'll develop pricing strategies for the product and calculate your manufacturing costs. You'll need to decide on the raw materials necessary to make your product and how long it'll take to assemble them into the finished goods.



Gather feedback and complete more testing

Before you release your product, you need to get feedback or complete further testing to ensure that you're delivering the best possible product. Feedback can come from focus groups, your team or friends and family. The more feedback you can compile, the better. If you can improve the product, it's best to do so before the official release.



Official release

Now you're ready to release the product. This should be done with a product **marketing campaign** to let your customers know about your product and why they will be interested. This can be done through various channels, from press releases to public launches, social media and more traditional media platforms.



5 types of manufacturing processes

You can divide the manufacturing process into five types. These processes are found in industries including food manufacturing, textile product mills, apparel manufacturing, wood product manufacturing, chemical manufacturing and computer and electronic product manufacturing.

01

Repetitive manufacturing

This is for manufacturing that runs day and night, year-round, producing the same or similar product. There is little setup and changeover and production speed can be sped up or slowed down as needed to meet demand.

02

Discrete manufacturing

Discrete manufacturing is another assembly or production line type of manufacturing. Because the products can be similar or different in design, there are various setups and frequent changeovers. Discrete manufacturing can be found in factories that make automobiles, furniture, airplanes, toys and smartphones.

03

Job shop manufacturing

Rather than an assembly line, job shop manufacturing is made up of various production areas that produce smaller batches of custom products. These are either made to order or made to stock. By organizing these workstations, manufacturers can make one version of a custom product or more in batches. This is good for bespoke products and work that's project-to-project.

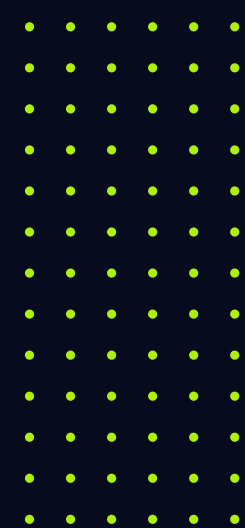
Batch process manufacturing

Similar to discrete and job-shop manufacturing, the batch process depends on consumer demand. After a batch is produced, the equipment is cleaned and prepared for the next batch, which is usually continuous. Product materials tend to be similar and the production process is more diverse.

Continuous process manufacturing

Like repetitive manufacturing, this one also runs 24/7. But the raw materials make this a different manufacturing process, as they are gasses, liquids, powders or slurries. However, in mining, the raw materials can be granule materials. This type of manufacturing occurs in industries such as oil refining, metal smelting and some food productions, such as peanut butter.





Supply chain planning



Supply chain planning

You can't predict the future, but you can make accurate forecasts about supply and demand by researching and analyzing the data. This is called supply chain planning. Let's take a closer look at supply chain planning and what it means for your business planning.

What is supply chain planning?

Supply chain planning is the process of optimizing the procurement, manufacturing and distribution of goods and services from manufacturers and suppliers to customers. This includes adjusting the plan according to demand planning forecasts while keeping in mind production capacity constraints and availability of materials.

The goal of supply chain planning is to meet the demand of customers while avoiding product overstock and other inventory management inefficiencies that bite into profits. Therefore, supply chain planning requires a supply management structure that meets demand effectively through maintenance, policy regarding stock, production and sourcing parameters.

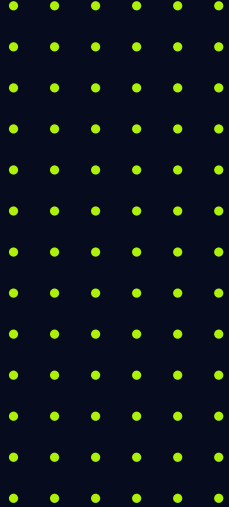
When using supply chain planning, you also seek to build strategic partnerships with suppliers and third-party manufacturers to create visibility and flexibility in vendor-managed inventory. This reduces the effects of demand volatility.



The supply chain planning process

There are many steps to supply chain planning. These are some of the processes one must undertake in order to achieve optimal manufacturing efficiency:

- ✓ **Supply management:** Start with the management of your supply of goods or services. Find a balance between the supply of goods and the demand for these products, while also keeping in mind production planning and the financial objectives of the business. You need to determine how to best meet these requirements.
- ✓ **Demand management:** Next, forecast the future demand for your goods and services. This requires accurate demand forecasting, matching inventory based on demand trends and improving the bottom line for your product or service. Demand planning is key to creating a successful supply chain plan.
- ✓ **Production planning:** Next is to consider production planning and manufacturing processes. The critical aspect of production capacity planning is to determine factory operations. Part of this is figuring out the number of resources and how they'll be **allocated across a schedule.**
- ✓ **Operation planning:** What are the operational processes you will implement to maintain an effective supply chain? This step requires scheduling to figure out a timeline and resources that meet operational goals. You'll also want to do a gap analysis on performance reporting, identification, cost and benefit analysis.
- ✓ **Sales planning:** Sales should be integrated with operations and warehouse management. Businesses need to respond to actual sales, marketing, demand coordination, production planning, inventory control and more. The goal is to make sure customer demand is met through production, distribution and purchasing processes.



Production planning



Production planning in manufacturing

Operations continue to become more complex, and this means manufacturing companies require more thorough production planning. A production plan is the best way to guarantee you deliver high-quality products/services as efficiently as possible.

What is production planning?

Production planning is the process of deciding how a product or service will be manufactured before the manufacturing process begins. In other words, it's how you plan to manage your supply chain, raw materials, employees and the physical space where the manufacturing process takes place.

What is a production plan?

A production plan is a document that describes how production processes will be executed, and it's the final outcome of the production planning process. It describes the human resources, raw materials and equipment that will be needed and the production schedule that will be followed.



How to make a production plan

When creating a production plan, make sure to follow these 5 steps to make it as robust as possible.



Estimate/forecast product demand

Understanding product demand planning is the best way to decide which product planning method is the best choice for your operation. From here, you'll be **able to estimate** which resources are required and how they'll be used in the manufacturing process.



Access inventory

Accessing inventory is about more than simply taking stock; you should make an inventory management plan so that you don't experience shortages or let things go to waste. For this step, focus on the inventory control and inventory management techniques you can use to handle inventory in the most efficient way possible.



Resource planning

A successful production plan requires you to be familiar with the resource planning details of the manufacturing process. Note the minimum number of people and raw material requirements necessary to create a product or execute a service. You need to also consider what machines and systems are essential for executing your production plan.



Monitor production

As production takes place, monitor how the results compare to the production schedule and resource management projections. This is something that should continually take place and be **documented** during the production process. Monitoring production is especially important for the fifth step in the production planning process.



Adjust the plan to make production more efficient in the future

Finally, reflect on the information you gained in step four and strategize what can be done to make the production plan run more smoothly in the future. Production planning is about manufacturing a product or service, but it should also be a learning experience for creating even better production plans for next time.



| Types of production planning

The same production plan isn't right for everyone. In order to get the most from **project planning**, you need to decide which method is best for your manufacturing process. Here's a quick intro to the different types of production planning.



Job method

The job method is often used when manufacturing a single product, for which a unique production plan is created. This production planning method is generally used in smaller-scale productions although it can be applied to larger manufacturing facilities. The job method is especially advantageous when a product or service requires specific customizations.



Batch production method

Batch production consists in manufacturing goods in groups, instead of being produced individually or through continuous production. This method is useful when manufacturing products on a large scale.



Flow method

The flow method is a demand-based manufacturing model that minimizes production lead time by speeding up production. The manufacturing process starts based on work orders, and once it starts, it doesn't stop until all finished goods are produced. This is called continuous production and it's achieved by using machinery and little intervention to minimize waiting time.



Process method

The process method is more or less what most people picture when they think about production—an assembly line. With the process method, there will generally be different types of machinery completing separate tasks to put together the finished goods.



Mass production method

The mass production method is primarily focused on creating a continuous flow of identical products. It's similar to the flow method, but at a much bigger scale, which cuts production costs. When uniformity is just as critical as efficiency, you need to use “standardized processes” to guarantee all products look exactly the same.



Common production planning mistakes

As you go through the production planning process, you must stay vigilant of common missteps. Here are three mistakes often made during production planning. Luckily, they can be prevented.

Not expecting the unexpected

This means having risk management strategies in place if things go awry. The goal is to never have to employ them, but it's better to be prepared. Production planning isn't complete if it doesn't anticipate risks, issues and changes. When you plan for them, you're ready to problem solve if and when they happen.

Getting stuck behind the desk

You should work with intelligent production planning tools, but that doesn't mean you should only rely on an enterprise resource planning software for production planning. When production planning is only done from behind a screen, the end result will not be as informed as it could be. The best production planning is active and collaborative.

Neglecting equipment

Regardless of the product or service, manufacturing means using tech. To get the most from your equipment, you need to take care of it. This means tracking usage and keeping up with regular maintenance. This looks different depending on the industry and product or service, but the principle is the same: continually take care of your equipment before it becomes a problem that will slow down production.

Production planning best practices

No matter what product or service is being manufactured, there are many tried-and-true best practices that set your operation up for success. When creating a production plan, keep these two in mind.

Make accurate forecasts

When you don't properly estimate the demand for your product or service, it's impossible to create a detailed production plan. Demand planning is never static. You need to consider buying trends from previous years, changes in demographics, changes in resource availability and other factors. These demand planning forecasts are the foundation of skillful production planning.

Know your capacity

Capacity planning means knowing the maximum capacity your operation can manage—the absolute most of a product or service it can offer during a period of time. This is the only way to anticipate how much of each resource you will need in order to create X amount of products. When you don't know the production capacity, your production planning is like taking a shot in the dark.



Demand planning

Demand planning

The constant push and pull of supply and demand can be difficult to navigate. How do you meet demand and not overstock your inventory? That's where a process called demand planning comes in. It's a way to boost profits and keep overhead costs down.

What is demand planning?

Demand planning is a cross-functional process that businesses use to meet customer demand while avoiding supply chain or inventory management disruptions. Demand planning is not a one-time process but rather is practiced continuously to respond to the market. This is accomplished by analyzing a company's sales, customer trends, historical sales and seasonal data.

You must use both internal and external research to determine the demand forecast for your product. Demand can be impacted by labor force changes, economic shifts, severe weather, natural disasters, global crises and more. It's not easy to estimate demand, but the more factors you consider, the more accurate your demand forecasting will be.

Once that's done, you can adjust sales and production planning to manufacture just the amount needed. Ideally, you'll have sufficient inventory to meet your customer's needs without a surplus. That's beneficial for your business' supply chain management and inventory management.



Why is demand planning important?

Demand planning can increase profitability, boost customer satisfaction and build efficiency in your production planning, inventory management and supply chain operations. While striking a balance between supply and demand isn't easy, the rewards are substantial.

On one hand we have inventory costs. Stocking excess inventory is expensive, and that's money you could use more effectively elsewhere in the business. There's also warehouse costs, as well as the fact that there's no guarantee the product will remain valuable. That's a lot of loss to deal with.

The other side of the coin is poor production planning, which can leave you unable to respond to demand—all because you didn't have adequate demand forecasting to analyze sales and customer needs. Now it's going to cost you as you struggle to fill orders.

Either way, you lose money due to poor demand management. Taking the time to engage in demand planning can help you **mitigate those risks**.



Key elements of demand planning

Demand planning is a complex procedure, but not impossible. Here are some of the elements that work together to help you balance demand with supply:

- ✓ **Data collection:** Gather data from both internal and external sources, which puts demand in context.
- ✓ **Statistical forecasting:** Look over your sales, inventory levels and other operational data to get a full picture of your capacity.
- ✓ **Modeling:** Feed your collected data into models such as algorithms and artificial intelligence that can predict the future demand for your product.
- ✓ **Collaboration:** Work with your suppliers, manufacturers, salesforce and other stakeholders in your supply chain to collect information that can impact demand.

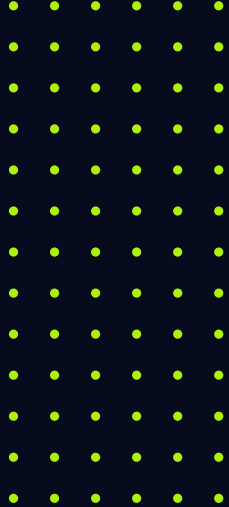
These considerations let you make a demand forecast, which is an informed prediction of the demand you expect. That leads even further to the next step, which is creating a demand plan.



The demand planning process

The demand plan is an outline of the amount, type and location of inventory you need to meet your customer's demand. All demand plans roughly follow these seven steps:

- ✓ **Assemble your team:** Put together a coordinated and effective cross-functional team with clearly defined roles and responsibilities.
- ✓ **Define internal data:** Find agreement on which sales data, inventory turnover, lead times, etc., are relevant for forecasting future demand.
- ✓ **Add external data:** Use the information you gathered on recent performance, delivery timelines, purchasing habits, etc., to round out your plan.
- ✓ **Make a statistical demand forecast:** Collaborate to decide what type of forecasting model fits your company and develop it.
- ✓ **Review and refine:** Take your demand forecast to stakeholders and have them review and analyze the work, adding any new data to see if the predictions still hold. Then, refine your data as needed.
- ✓ **Check your inventory:** Determine the inventory levels you need to meet your demand forecast, including a bit extra as a buffer. Identify vendors who will help you meet this demand and ensure they can deliver on your timeline.
- ✓ **Track results:** Use key performance indicators (KPIs) to measure the effectiveness of your demand plan. Make adjustments as needed.



Resource planning



Manufacturing resource planning & materials requirements planning

Manufacturing requires the right balance of many factors. One of the most important is inventory management—the materials and components needed for the manufacturing process. The more efficiently a company handles its material requirements, the more profit it will find.

Everything you need for your manufacturing process is a resource—people, materials, equipment, software, facilities, etc. Whatever you're making, you need to manage those resources.

That process is called manufacturing resource planning (MRP II), and it's a method that is used to work more effectively. When needing precise coordination of resources to get the work done on time and within budget, you're going to need to create an MRP system.

Why is it called MRP II? Well, that's because manufacturing resource planning (MRP II) evolved from materials requirements planning (MRP I), an earlier resource planning system. Let's take a look at both to learn the differences, and how to apply them to your own processes.



What is material requirements planning? (MRP I)

The manufacturing industry developed material requirements planning (MRP I) to improve inventory management efficiency. Also known as an MRP system, it's become a standard supply planning tool that helps product-based manufacturing businesses. The Material requirements planning method was the base for the development of Manufacturing Resource Planning (MRP II).

What is material requirements planning? (MRP I)

Material requirements planning is a digitally-operated method of managing inventory. When used properly, an MRP system improves production process efficiency through accurate estimation of required materials and just-in-time delivery.

Material requirements planning helps manufacturers keep low production inventory levels because they're controlling the manufacturing, purchasing and delivery activities. Before the advent of computers, production planning was all done by hand, using calculations for reorder quantity and reorder point.



What is manufacturing resource planning? (MRP II)

Manufacturing resource planning (MRP II) is the process of creating an MRP system that allows manufacturers to account for the raw materials and human resources needed for their manufacturing process. MRP II touches on operational and financial planning but also explores contingency planning that creates additional paths forward when issues arise.

There is no proprietary software associated with manufacturing resource planning, and therefore, there are many solutions offered. But almost all manufacturers use some kind of software to create an MRP system.

MRP software is usually modular and has various components that include:

- ✓ A master production schedule
- ✓ Technical data
- ✓ Bill of materials
- ✓ Production resource data
- ✓ Inventories and orders
- ✓ Purchasing management
- ✓ Materials requirement planning
- ✓ Shop floor control
- ✓ Capacity planning
- ✓ Cost control
- ✓ Reporting

And that's only the beginning! There are other tools for business planning, tool management, sales analysis and project management. MRP II integrates many manufacturing processes so you can organize and manage them.

Why is manufacturing resource planning important?

Manufacturing resource planning allows for a more productive and tight production schedule that keeps costs low. It also provides valuable data from the production floor you can use to address issues that slowed down manufacturing in the past—so you don't repeat it in the future.

There is also a **reduction of workload** that results in greater efficiency when you apply resource planning. The data you collect helps you plan ahead and make more accurate estimates that lead to greater profitability for the company.

In the past, stock control and management were the only tools manufacturers had to run efficiently. Manufacturing resource planning is far more effective in managing resources and making more effective plans. Its use saves the company money, time and labor.

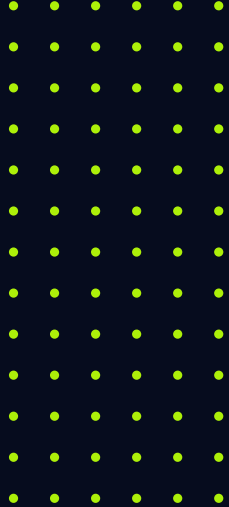


How to make a manufacturing resource plan

When creating a manufacturing resource plan, you need to ask yourself three questions. What is needed? How much is needed? And when is it needed? Working backward from the finished product is how you begin to assemble the materials you'll need for a manufacturing resource plan.

You can break down the process for manufacturing resource plans into four basic steps:

- ✓ **Make estimates of product demand:** From there, you can figure out the resources necessary to have your supply meet that demand. Those resources are broken down by a bill of materials, which is the list of raw materials, assemblies and other components necessary to manufacture your end product. Don't forget to include your personnel in this estimate, as they're also resources.
- ✓ **Compare demand to current inventory:** This will inform how many resources you need to meet demand, on top of what you already have in stock. Manufacturing resource planning allocates the inventory where it's needed.
- ✓ **Create a production schedule:** That means figuring out how much time each step in your manufacturing process will take. Again, you work backward from a deadline.
- ✓ **Monitor the entire process:** Make sure that you're meeting milestones and not going over budget. Most manufacturing resource planning software will have notifications that alert you if things are going off-track. If this occurs, have a contingency plan in place.



Capacity planning



Capacity planning

Production capacity planning is an issue of supply and demand: one that can decide the fate of your project or production line. Read on to learn about the capacity planning strategies and capacity management best practices you can use to plan your resources, and make sure your team members are working on the right task at the right time.

What is capacity planning?

Capacity planning is a process that balances the available resources to meet customer demand or the project **capacity requirements**. Capacity, in project management and manufacturing terms, is the most work that can be done over a certain timeframe.

In project management, the capacity planning process is very important because it's related to critical project management knowledge areas such as:

- ✓ Resource management
- ✓ Time management
- ✓ Team management
- ✓ Work management

Production capacity, strategic planning and project planning obviously go hand-in-hand. Planning is how one schedules the hours of the team members so that the work gets done in time. Capacity management is not a rigid process. All companies are different and demand can be volatile, so there are different capacity planning strategies that project managers can use to adapt to different scenarios.



Capacity planning strategies

There are three capacity planning strategies to help you meet demand, cover your **resource requirements** and increase your team members' productivity.

Lag strategy

The lag strategy consists in having enough resources to meet actual demand, not projected demand estimates. This capacity planning strategy is beneficial for smaller organizations that have low capacity requirements.

Lead strategy

The lead strategy consists in having enough resources to meet demand planning forecasts. This capacity planning strategy is beneficial when demand increases, as your excess capacity can cover the increased demand.

Match strategy

This strategy is a mix of the lead and lag capacity planning strategies. In this case, project managers need to monitor actual demand, demand planning forecasts and market trends to adjust capacity accordingly.



Capacity planning benefits

Production capacity planning is an important strategic planning process for many reasons. Here are some of the main benefits of effective capacity planning.

- ✓ Reduces costs
- ✓ Prevents stock-outs
- ✓ Reduces production lead time
- ✓ Eliminates excess capacity
- ✓ Helps with supply chain and resource management



Capacity planning best practices

Here are some tips and capacity planning best practices to help you manage your resources and teams.

- ✓ **Establish cross-functional teams:** To **collaborate and communicate** about production capacity and resource management, you want a cross-functional team with different functions.
- ✓ **Calculate resource capacity:** Before you can create a production capacity plan, you need an idea of your current capacity and your available resources.
- ✓ **Determine resource requirements:** For each project, look at the scope and what resources are required to do the task for the project.
- ✓ **Prioritize projects:** Which projects are most important, and which can be put aside for the time being? You can't do everything at once.
- ✓ **Allocate resources based on project priority:** Now allocate those prioritized projects and make sure that they are aligned with the goals of the organization.
- ✓ **Keep lines of communications open:** Communicate between executives, project management leaders and stakeholders.
- ✓ **Document known risks:** Monitor risks such as union strikes, weather, government regulations that stop a project or create new ones unexpectedly.
- ✓ **Plan for how to handle too much capacity:** Understand where it is and how to resolve it (such as reassigning), or not enough capacity (again, where/how).

Capacity planning vs. resource planning

While “capacity planning” and “resource planning” are often used interchangeably, they aren’t the same. We’ve outlined the differences below.

Capacity planning

- ✓ It’s a strategic planning process designed to help you determine if the organization has the production capacity required to meet demand
- ✓ It looks at resource availability at the skill set/team level
- ✓ Then it facilitates the decision-making process to hire resources or defer/approve/cancel projects
- ✓ Capacity planning is about supply and demand

Resource planning

- ✓ It’s a strategic planning process that coordinates and allocates actual resources to project tasks based on resource requirements
- ✓ It provides a plan to project managers, which resources they can plan to use for their projects and when
- ✓ Resource planning focuses on resource allocation



Master production schedule



The master production schedule

Creating a master production schedule is crucial in ensuring your supplies match demand. A robust master production schedule also supports your sales force and strengthens your business capacity to meet the needs of your customers.

What is a master production schedule?

A master production schedule outlines which products will be manufactured and when they are made. This includes data from the bill of material, which is a list of all the raw materials required to produce your product. This list is integrated with your current inventory to determine if any procurement for further materials is needed to begin manufacturing.

This schedule outlines the various processes and resources to make production move forward smoothly while **identifying potential bottlenecks** and creating plans to avoid them. It can be the difference between an organization making a profit or experiencing a loss in revenue.

A master production schedule also serves as a channel for communication between the sales and the manufacturing teams. Because this is a continuous dialogue, the master production schedule is flexible and open to change as needed.



Function of a master production schedule

Having a plan that can forecast the demand for your product over a period of time is the primary purpose of a master production schedule. Other than that, it also saves time managing the various processes involved in the manufacturing of your product.

The main functions include:

- ✓ **Planning:** Balancing market demand to materials, labor and the capacity of your equipment to deliver the goods.
- ✓ **Make adjustments to schedule:** Schedules need to have a contingency for unexpected delays or mistakes that stop the flow of product.
- ✓ **Prevent stockouts:** Planning for capacity requirements to maintain output of production.
- ✓ **Improve efficiency and control costs:** The better the plan, the more likely you'll stay on schedule and identify potential efficiencies.

Another function is to keep your commitments to your customer base. Manufacturing only works when it serves its customers on time and within budget.

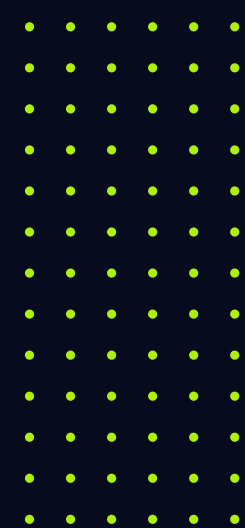
When you have the right master production schedule process, your demand flows smoother, lead times improve, communication is standardized, requirements are prioritized and production is kept stable.



Master production schedule process

When making a master production schedule, you need to follow a process to fulfill the function of the schedule. The best way to do that is by following these steps.

- ✓ Start with a demand plan, which maps all the demands that your master production schedule is going to respond to.
- ✓ Identify all the raw materials you'll need and secure a supply chain to deliver those materials to your production.
- ✓ Develop a proposal of the master production schedule to make sure the schedule is able to meet its requirements.
- ✓ Make any calculations necessary to see if it can meet the demands of your master production schedule draft. These calculations should continue throughout the process to make sure you're always meeting demand.
- ✓ Once you've tested the draft and it meets your requirements, you can ensure that it aligns with your customer service, resources and the investment you've made into inventory.
- ✓ The next step is making sure you clearly communicate the production schedule to everyone who is involved in the manufacturing process. You want to make sure your team is on the same page.
- ✓ Return to your schedule to see if your supply is balanced with demand. It should tell you whether you need to increase or decrease production. This ensures you produce the orders generated by your sales team and deliver them on time and with the expected quality.



Manufacturing overhead



Manufacturing overhead

Producing things isn't cheap. There are so many costs that occur during production that it can be hard to track them all. These costs are what is called manufacturing overhead.

What is manufacturing overhead?

Manufacturing overhead is part of a company's manufacturing operations, specifically, the costs incurred outside of those related to the cost of direct materials and labor. This is why manufacturing overhead is also called an indirect cost.

However, costs outside of manufacturing facilities aren't product costs and are not inventoriable. These costs, which include selling, general and administrative expenses, such as corporate salaries, audit and legal fees, are simply recorded as expenses and are added to the income statement for the accounting period in which they occur.

Manufacturing overhead is added to the units produced within a reporting period and is the sum of all indirect costs when creating a financial statement. It's added to the cost of the final product along with direct material and direct labor costs. According to generally accepted accounting principles (GAAP), the manufacturing overhead appears on the balance sheet as the cost of a finished product in an inventory and work-in-progress inventory as well as the cost of the goods income statement.



What's included in manufacturing overhead?

Manufacturing overhead is referred to by indirect costs because it's hard to trace them to the product. A final product's cost is based on a predetermined overhead absorption rate. That overhead absorption rate is the manufacturing overhead costs per unit, called the cost driver, which is labor costs, labor hours and machine hours.

There are five basic types of costs that are included in manufacturing overhead, which are as follows:



Indirect labor

These are costs that the business takes on for employees that aren't directly involved in product production. This can include security guards, janitors, those who repair machinery, plant managers, supervisors and quality inspectors. All their salaries are considered indirect labor costs. That means **tracking the time spent on those employees working**, but not directly involved in the manufacturing process.



Indirect materials

These are costs that are incurred for materials that are used in manufacturing but aren't assigned to a specific product. Those costs are almost exclusively related to consumables, such as lubricants for machinery, light bulbs and other janitorial supplies.



Utilities

Costs associated with utilities can be hard to calculate as they fluctuate with the number of materials being produced. Therefore, natural gas, electricity and water are overhead costs, but they aren't constant. You might need more or less depending on the demand for your product in the market.



Physical Costs

These physical costs are calculated either by the declining balance method or a straight line method. The declining balance method involves using a constant rate of depreciation applied to the asset's book value each year. The straight-line depreciation method distributes the carrying amount of a fixed asset evenly across its useful life. The latter is used when there is no pattern to the asset's loss of value.



Financial Costs

These are financial overhead costs that are unavoidable. This includes things such as property taxes that the government might be charging on your manufacturing facility. But they can also include audit and legal fees as well as any insurance policies you have. These financial costs are mostly constant and don't change so they're allocated across the entire product inventory.

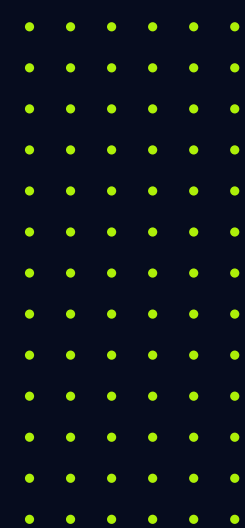


Manufacturing overhead calculation example

First, identify the manufacturing expenses in your business. Then, add them or multiply the overhead cost per unit by the number of units you manufacture. To get a percentage, divide by your monthly sales and multiply that number by 100. Here's the manufacturing overhead equation:

Manufacturing overhead costs / number of sales x 100 = Percentage

Consider Tillery Manufacturing, a business that makes shoes. In a good month, Tillery produces 100 shoes with indirect costs for each shoe at \$10 apiece. The manufacturing overhead cost for this would be 100 multiplied by 10, which equals 1,000 or \$1,000. Now, what is the percentage of that? You need to first figure out what your monthly sales are. Let's say you sell 50 shoes each month. Therefore, the percentage is 1,000 divided by your monthly sales of 50 multiplied by 100 equals 5000. That gives you a percentage of two percent, which is very good. Your fantasy manufacturing business is very efficient!



Supplier relationship management



Supplier relationship management

Your business depends on getting products to a target audience. That can't happen without a steady stream of raw materials and other necessary supplies. Managing your relationships with suppliers and vendors is critical to keeping a manufacturing enterprise viable.

What is supplier relationship management?

Supplier relationship management (SRM) is a way to manage work with vendors who are supplying goods, materials and/or services to a manufacturer. It involves evaluating relationships and strategizing to improve their performance in relation to a manufacturing business.

This is done by looking at each of the vendors that are supplying something to a manufacturer and determining which is most important to the business in terms of continuity and performance. These evaluations allow managers to cultivate a better working relationship with vendors.

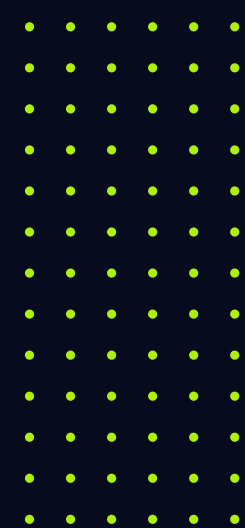
SRM is used by professionals involved in managing supply chains. They are the ones who are in frequent communication with vendors due to managing procurement, project management and operations. That's why SRM is often referred to as supply chain management. It's also close to what's commonly called vendor management and procurement processes.

There are, however, differences between supply relationship management and these other related fields. Costs and service agreements between vendors and organizations are the aim of vendor management. The purchases themselves are the goal of procurement, in that it deals with the ordering, contracting, invoicing and paying off those procurements.

Benefits of supplier relationship management (SRM)

Part of having a successful business is increasing efficiency. To increase efficiency and in turn profits, companies employ supply relationship management among other techniques to run a better business. The benefits of using SRM are many, but they all contribute to a better bottom line.

- ✓ **Cost savings:** Relationships with vendors are based on financial incentives. SRM is a means of cost reduction by finding a mutually beneficial relationship to save money over the long term. Developing these cooperative relationships with vendors can help with reducing availability issues, delays, problems in the quality of materials and more.
- ✓ **Greater efficiency:** Developing a relationship with a vendor means building trust, which facilitates better working conditions. This allows for a smoother supply chain flow. That means fewer disruptions and when there are issues, having a strong connection with suppliers will help resolve them faster.
- ✓ **Continuous improvement:** Building a mutually beneficial connection between manufacturers and their suppliers not only builds trust but opens up feedback and the free flow of ideas. This communication leads to greater efficiency, more streamlined processes and greater customer service. Having project management software to connect ordering, inventory control and more can better facilitate these benefits.
- ✓ **Less price fluctuation:** When a manufacturer uses SRM, they can often set a price for materials so if there's fluctuation in the market, their costs remain the same.



Manufacturing project management with ProjectManager





Plan and monitor projects on Gantt Charts

To organize your manufacturing resources and timeline, use **ProjectManager's Gantt chart** to create your production schedule. Gantt charts are planning tools that help you schedule tasks across a timeline. You can then link any dependent tasks to avoid bottlenecks in your manufacturing processes. For example, if a strap needs to be stitched to the body of a handbag before the embroidery can be added, you identify this dependency and link the two tasks to keep production running smoothly.

On our powerful Gantt chart, you can set up individual or recurring tasks, assign them to the right team members, link dependent tasks and set milestones. Using our online Gantt chart helps you manage your manufacturing projects across a timeline with resources, such as raw materials, tracked by cost to make sure you're never overspending. Even better, the dynamic Gantt chart is flexible and can be quickly edited to reflect changes in orders and capacity. As you make changes to your project or schedule, your team member will automatically be notified and have access to the most recent data.



Keep team workload balanced with resource management tools

Manufacturing processes are only as good as the people who are running them. With our resource management tools, you can make sure that your team is working at capacity and that there's minimal downtime in their schedules without overworking them. Use the color-coded workload chart to see who is doing what and then reallocate resources as needed from the workload chart to balance the workload and boost productivity.



Manage project risks

ProjectManager offers different views including the calendar, Gantt, board, list and sheet views. In addition, we offer a customizable risk list view that enables customers to prevent unexpected impacts on project scope, costs and delivery. In the risk list view, you can establish and oversee project risks all from one location. Attach files, add comments, determine the likelihood, add an assignee and so much more. Now, potential risks can be addressed and mitigated before they evolve into something more serious.



Track your production cycle

In terms of monitoring your manufacturing production and resources, ProjectManager has two tools. The real-time dashboard on both a project and portfolio level collects live data and automatically makes calculations, which are displayed in easy-to-read charts and graphs. Dashboards give you a high-level view of your manufacturing process while keeping close tabs on cost, tasks, progress, workload, time and overall health.

For a deeper dive into project or portfolio data, use our **one-click reports**. You can generate data on everything from timesheets to workload, status reports and more. Once you've created your report with customized columns, share it with stakeholders to keep them updated on progress. All reports can be filtered to show only the data you want to see and then easily shared with stakeholders to keep them updated.

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