

katana

Small Businesses Manufacturing 101

A thick yellow line starts on the left side of the page, curves upwards and then downwards, crossing the word 'Manufacturing' in the main title, and continues to curve downwards towards the bottom right corner of the page.

A note from the authors

We've built the first [Smart Manufacturing Software](#) as a result of our own frustration as manufacturers, trying to find a suitable tool for production and inventory management. All the online tools available on the market were either too complicated to use, ridiculously expensive, or had a clunky interface. We knew there had to be a better way and that's how Katana was born.

We've now compressed our 15+ years of experience of inventory management to reveal the foundation principles every modern manufacturer should know. The e-book is written for manufacturers who want to expand their knowledge and improve the way they run their business regardless of whether they are proven veterans or complete newbies.

Industry expert insights to follow!



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What is Manufacturing?

Manufacturing is the transformation of raw materials, components, or parts into a final product that meets a customer's demand and satisfaction.

Where can you find the butcher, the baker, the candlestick-maker? They might not share a tub anymore, but one similarity they all share is that their businesses all belong to the manufacturing industry.

The manufacturing definition giving by [Dictionary.com](https://www.dictionary.com) on the term manufacture reads “the making of goods or wares by manual labor or by machinery, especially on a large scale.”

We'd like to be so bold as to disagree with the use of 'especially'. It could be argued as an archaic view since more customers want customization, something big manufacturers find difficult. Our preferred word of choice would have been 'usually' instead.

Here is our manufacturing guide for small businesses.



Types of Manufacturing Processes

There are five types of manufacturing processes you should know about:

Repetitive Manufacturing

Products are manufactured one after the other

Discrete Manufacturing

Also constantly manufactured, but product variations require different setups

Job Shop Manufacturing

Each stage during manufacturing takes place at a different workstation

Manufacturing Process (Continuous)

Constantly making products from gases, liquids and slurries.

Manufacturing Process (Batch)

Products, made from gases, liquids or slurries, production takes place in several places in stages.



PRO TIP: Take a look at our blog post on the [five manufacturing processes](#) to get more information.

Lean Manufacturing

Lean Manufacturing is a concept from Japan with the aim of eliminating muda (waste) from the manufacturing process, to give more value to the customer.

It allows your business to identify where your own production methods can be improved and allows you to reexamine and change approaches to your manufacturing process.

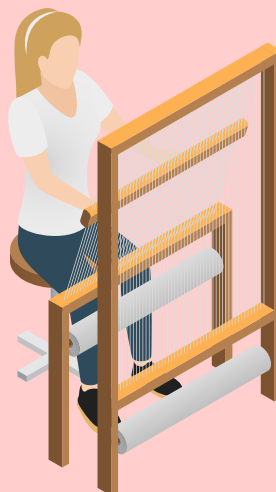
Application of lean manufacturing means that you can operate at your most efficient. Which increases the chances of your company growing, instead of fizzling away from poor management habits.



The Seven Mudras

There are seven areas you should examine when trying to become a lean manufacturer:

- > **Transport**
Moving products cost money and adds no value
- > **Inventory**
Products take up space, needs to be moved and can become damaged
- > **Motion**
Getting to work or moving equipment around
- > **Waiting**
Waiting for repairs or waiting for a delivery of material
- > **Overproduction**
Making too much product and/or making it too soon
- > **Over Processing**
Using a machine or methods that takes longer and doesn't add more value
- > **Defects**
Products being replaced, repaired or recalled



Types of Workflow

Your workflow is going to determine how you produce productions, organize your business and sell your products. Will your business be:

Make to Order (MTO)

MTO products are made to a customer's order. It allows for customization but means the customer must wait.

Make to Stock (MTS)

MTS products are made to a sale forecast. The customer gets the product (if in stock) immediately, but means products are standardized.

Assemble to Order (ATO)

ATO products are made from sub-assemblies and finished on a customer's order. Once again, it means an order can be fulfilled quicker and allows for some customization.



Can You Make a Living as a Small Manufacturer?

The industry has a lot of potential for someone to make a decent living because in 2012, manufacturers contributed \$2.03 trillion to the economy.

But, obviously, you can imagine that if you're mining coal, your profits will be higher than a tortilla maker.

IRS figures show that, in 2008, the average revenue of a sole proprietorship ranged from \$11,862 to \$1,073,406 mines.

In 2017, the average manufacturing worker in the United States earned \$84,832 annually.

For example, we could look at the fashion industry, which in 2015 was calculated to be a 1.2 trillion global industry, with more than \$250 billion spent annually on fashion in the United States.

There are around 17,000 fashion designers operating in the industry, each earning on average \$73,600.



The Narrative of a Small Business Manufacturer

Now you have a better understanding of the industry and are maybe feeling more confident to pursue your fantasy of becoming a small business manufacturer, where the hell do you start!?

Or maybe you've already started but you need a little extra help to streamline your operations.

In the next section, we're going to explain exactly what you need to know if you wish to survive in this highly-competitive industry.

We'll go through it in a logical order, from very beginning (your idea) to selling your goods.



Prototyping

Prototype: test, improve, test, improve, test, improve...

You have your idea and even though you'd love to instantly invest everything you have to get this out into the public sphere, you simply can't!

Patience is a virtue... Just, don't use that one on your customers.

Maybe it'd be a good idea to attend showrooms and conventions to see if anyone is manufacturing a similar product to you. It might be that you could need to contract a manufacturer, and this would be a good place to look if you're unable to create a prototype yourself.



If you're onto an invention that's revolutionary, it might also be worth looking into securing a patent on your design.

Bill of Materials / Product Recipe

Once you have perfected your prototype and now have a final product, you'll be left (unless you for some reason never documented the alterations to your original recipe) with a bill of materials (BOM) - also known as product recipe - which is essential for your manufacturing processes.

A BOM is a list of raw materials, sub-assemblies, intermediate assemblies, sub-components, parts and quantities needed to create your product.

The BOM, just like the prototype, can also go through reiterations as you perfect the process of manufacturing your product.



Types of BOMs

Depending on your products construction requirements, you'll be using one of three types of [BOMs](#):

Modular BOM

Modular BOMs are used for products that require completion through sub-assemblies.

Configurable BOM or CBOM

Configurable BOMs are used in industries that have multiple options with customizable goods.

Multi-level BOM

Multi-level BOMs contain lists of the components, assemblies, and parts required to make a product. Sometimes referred to as a top-down method as the relation between the finished product and its parts are highlighted.

Think of it like a family tree.



Manufacturing Cost (MC)

The manufacturing cost (MC) is determined by the amount of resources spent on creating your wares. This is figured out by looking at two types of expenses:

Direct Manufacturing Cost

Direct manufacturing cost comes from money spent on material and the cost from time spent manufacturing.

Indirect Manufacturing Cost

Indirect manufacturing expenses from utility bills, salary of non-manufacturing staff, and Maintenance, Repair, and Operating items (MRO).

Another thing you should be aware of is the cost of consumables.

To calculate your manufacturing costs, you will need to look at the three types of manufacturing costs which are, direct materials, direct labor and manufacturing overheads.



MC formula:

$MC = \text{Raw Materials} + \text{Direct Labor} + \text{Allocated Manufacturing Overhead} = \$\$\$$

Manufacturing Overheads

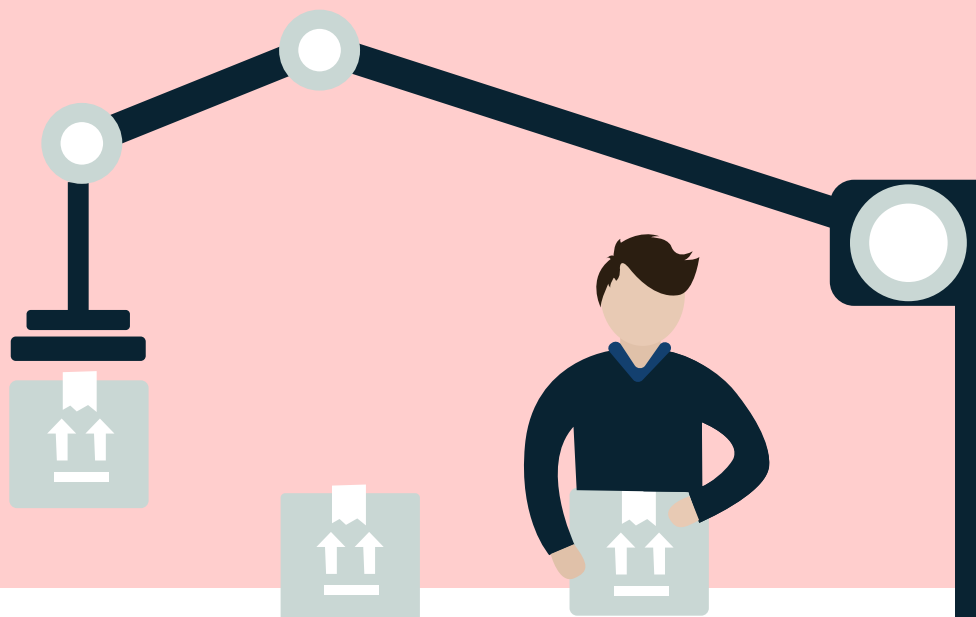
The manufacturing overheads are the expenses from indirect factory-related costs incurred from products being manufactured.

Examples of manufacturing overheads are the costs for using machinery during production, rent and property taxes of the business's premises, salaries and wages of workers and utilities for the factory.

However, it should be quickly mentioned that this does not include administrative costs, salaries and debts.

Manufacturing overheads are also known as factory overhead, production overhead and factory burden.

It is mandatory to assign manufacturing overhead to the cost of products, both for reporting their cost of goods sold, and their cost within the inventory asset account (reported on the balance sheet).



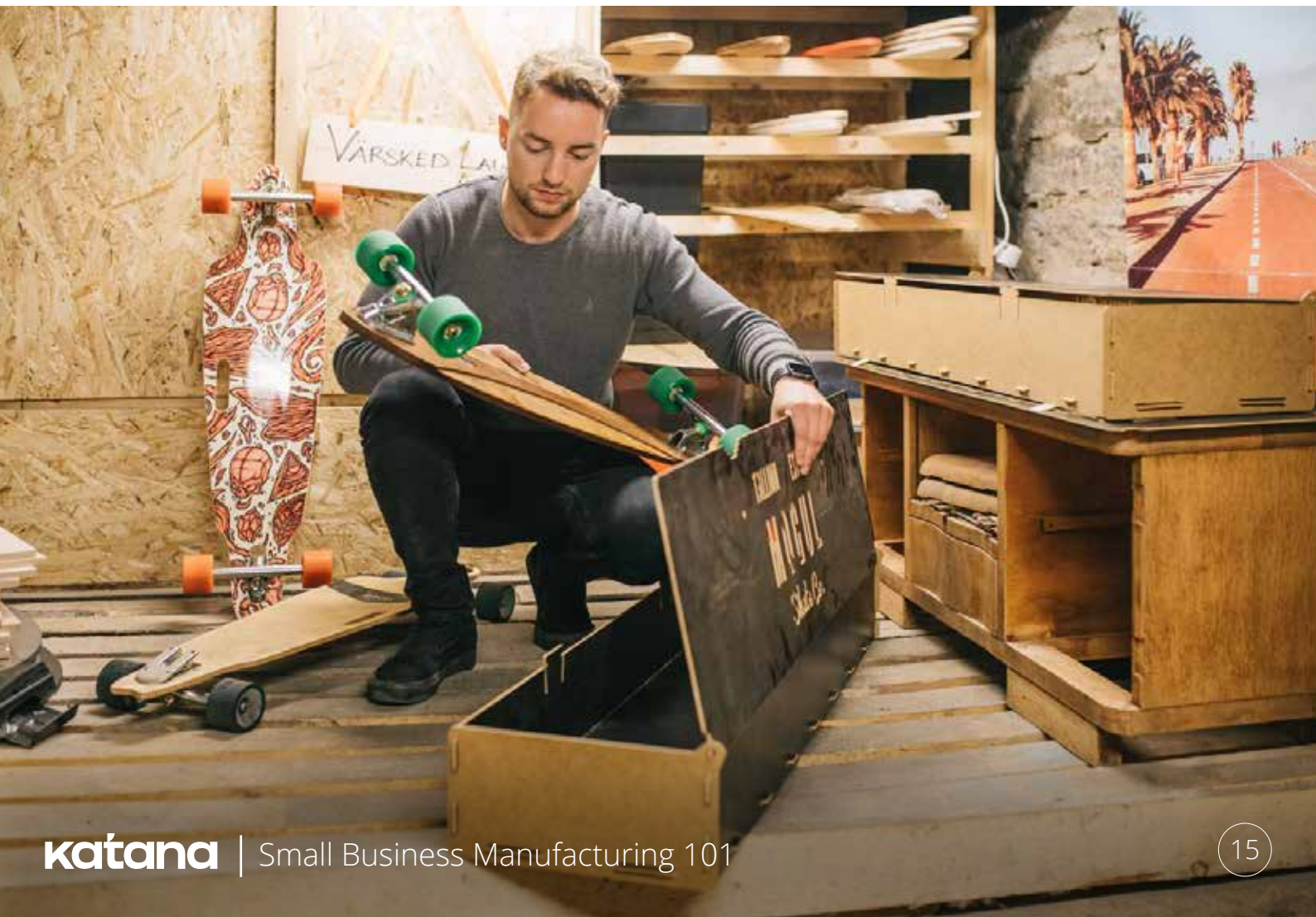
Manufacturing Order (MO)

The manufacturing order (MO), depending on how you prepare your products (MTS, MTO or ATO) will come through either due to stock levels or from a sales order and will be prepared as the manufacturing instructions.

MOs can be classified into an internal order (to be manufactured by the company itself) and subcontract order (to be manufactured by subcontractors).

But what happens if you create a MO, but don't have the materials to fulfill the order?

The next trick is to stay ahead of your MOs, as to not create delays and keep your customers waiting.



Manufacturing Lead Time

The manufacturing lead time is the calculation of the time the sales order comes in, up until its creation.

You can calculate your manufacturing lead time by adding together the different production times for your product:

Order preparation time + queue time + setup time + run time + move time + inspection time + put-away time.

The method in which you forecast your lead time will determine on if you're an MTO or MTS business.

MTO

creating manufacturing order to production and shipment

MTS

creating manufacturing order to production, receiving sales order and inventory stock.

Manufacturing floor-level control

The manufacturing floor-level control is the prioritized task list for every production employee and production line.

Consider it like a manager role, where they'll need to schedule, monitor workflow and delegate responsibilities to employees.

How you implement this is up to you, however, you'll want to use a system where workers can easily access a schedule calendar, so they know exactly where they need to be and what needs to be done.

You can go that extra step by looking into making this easier with production scheduling software.



MC formula:

$MC = \text{Raw Materials} + \text{Direct Labor} + \text{Allocated Manufacturing Overhead} = \$\$\$$

Master Production Scheduling

Your master production scheduling will inform you what you need to produce, the quantity, the deadlines and everything that is related to production, even production lead time.

It is crucial that you have a master production scheduling if you want your business to operate properly. Also, it's a good habit to instill early as it will help when your business scales up.

Other master production schedule objectives are:

- Making your demand flow smoother;
- Keeping your lead-time low;
- Standardizing communication across your business;
- Helping you to prioritize workloads;
- Keeping production stable;
- Generating workable plans for your manufacturing orders and;
- Assisting in making accurate purchase and transfer orders.

You can figure out your master production scheduling by product list, variation sub-lists for each product, year, month and week and production quantities.

Supply Chain Management

Supply chain management is quite simply getting your product from Point A to Point B.

A supply chain manager is concerned with the “design, planning, execution, control, and monitoring of the supply-chain activities with the objective of creating a net value, and building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.”

Their other responsibilities will include negotiating with suppliers to get materials, shipment of materials as efficiently as possible and to get the product on the store shelves as quickly as possible.

Essentially, they make, source and dispatch products.

However, this could be a role of one or more individuals when your business expands into an empire.



Cost of Goods Sold

The **cost of goods sold** (COGS) examines how much it costs your business to sell inventory over a given period of time. The frequency in which you do so is completely up to you.

It is essential for you to look into your COGS as it can be used for reporting your business income tax and, most importantly, study your companies' expenses.

You'll want to include income and expenses:

Income

The sale income from manufactured goods;
and the sale income from any resold goods

Expenses



Your formula should look something like this:
COGS formula - $COGS = (\text{Beginning Inventory} + \text{Additional Inventory}) - \text{Ending Inventory}$

The Woes Modern Manufacturers Face

When you or a small handful of creatives run your own business, you would have begun because of your love for designing and creating.

But quickly, you were pulled into the business and administrative world, taken on several responsibilities and roles.

Time is precious to you, and especially for your business. Unfortunately, you're probably being dragged into the inefficiencies of Excel spreadsheets, or you're contemplating spending all your money on some software which has been developed for a large-scale manufacturer.

What if we said there is Smart Manufacturing Software designed for the small artisan, crafter and manufacturer? Which functions as a core dashboard for the business's operations.



How to Put into Action

A Smart Manufacturing Software, particularly designed for modern businesses can assist you with:

A Means of Managing Inventory

Real-time inventory control gives you up-to-date information from one dashboard.

Storing Your Bill of Materials

A page dedicated to your products recipes, including all its possible variations.

Calculating Direct Manufacturing Costs

Tracks Manufacturing costs based on your BOMs and production operations.

Calculating Manufacturing Lead Time

Track the availability of required products to decide whether you need to make a manufacturing order or fulfill an order from product stock.

Production Scheduling

Prioritized task with real-time production status overview information from the floor-level

Cost of Goods Sold (COGS)

Make accurate pricing decisions based on actual product margins.



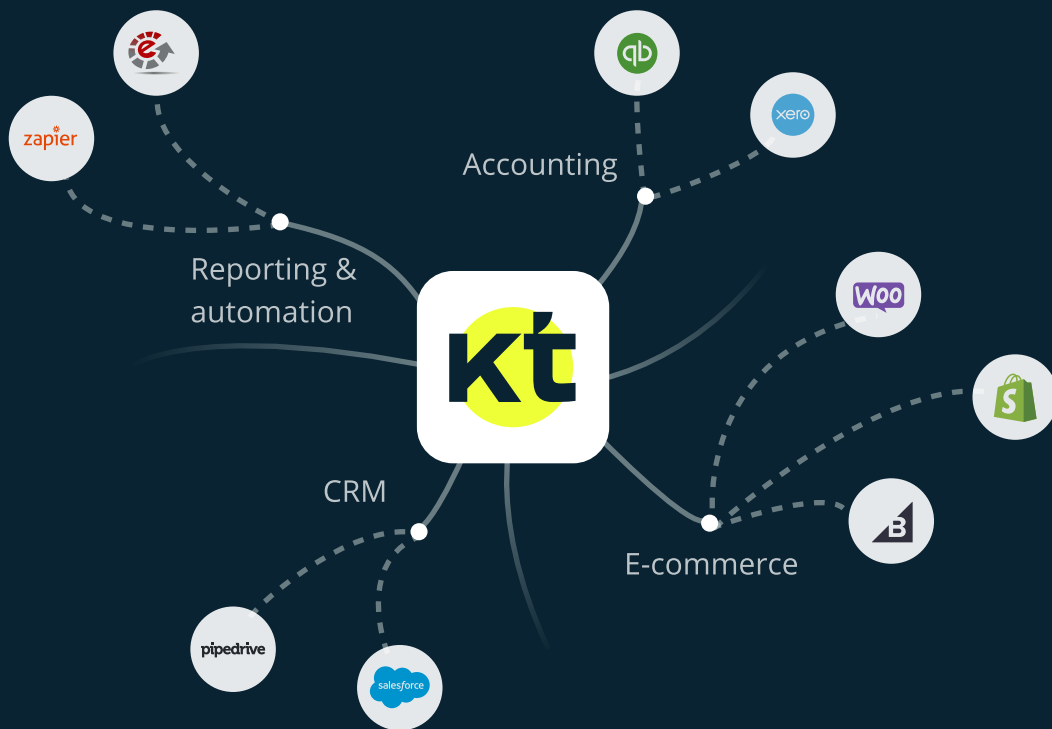
Save time, hassle and money by integrating a Smart Manufacturing Software into your business.

Katana

Get in the driver's seat of your product-making business with Katana the Smart Manufacturing Software.

Are you ready to scale your business?

Start your 14-day free trial



About Katana | www.katanamrp.com

Katana is the #1 modern manufacturing & inventory software for scaling businesses. Automate your workflows with Katana's visual interface and smart auto-booking engine, which allow you to prioritize orders and see the availability of raw materials & finished goods in real-time. Easily create bills of materials for your products and their variants, gain multichannel inventory visibility and floor-level control. Seamless integrations with Shopify, WooCommerce, QuickBooks, Xero, etc.

