Business Process Mapping

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Introduction

Whether it is processing a customer order or retrieving inventory, office or shop floor, everything you do is a business process. Because your business is a series of these small processes happening at all times everywhere, it is imperative that you know and understand what each process entails so that you can work toward streamlining and improving these processes wherever possible to unlock the maximum potential in your business.

Keeping It Simple

Manufacturing is complicated. Everyone knows this. But lately it seems like you are running just to stay in place. Also, customers and content keep falling through the cracks in your steps with data or inventory lost and customers increasingly unhappy. You can't cut costs anymore and you cannot cut your prices any further. You competitors are getting ahead and you can't understand why.

Or maybe you are implementing a new system and don't know where to start. While the new system preached efficiency, half your staff are taking twice as long to perform their tasks, while the other half simply gave up moving to the new system and are still doing things the old way, or worse, reverted to pen and paper as a way to keeping records.

While manufacturing is complicated and implementing any new system has a learning curve, there is no need to make things worse than they already are. Manufacturing can be simplified and the benefits of implementing can be clear and concise. The key to both is knowing what is going on in your company. The business processes that you perform.

Business processes are the regularly repeated series of tasks, steps, or actions that are taken at your company and the people, teams, or groups that are involved in carrying out each step. Whether they be a daily process like pushing work orders to the shop floor, a weekly process like payroll, a monthly process like paying your vendors, or an annual process like tax season. A process is basically everything you do.

But how can you do track and see everything you do?

Analysing Processes

This is the job of **business process mapping**. A good business process map allows you to visualize your business processes and quickly spot the product and the waste. And once you find the waste, LEAN thinking is there to help you cut waste, easily remembered by the acronym DOWNTIME, and improve your company productivity and profit.

For more information on waste, see our white paper on cutting waste with LEAN Thinking (add link to Cutting Waste white paper here)

Defects
Efforts caused by rework, scrap, and incorrect information.

Overproduction
Production that is more than needed or before it is needed.

Waiting
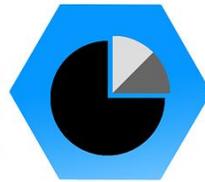Wasted time waiting for the next step in a process.

Non-Utilized Talent
Underutilizing people's talents, skills, & knowledge.

Transportation
Unnecessary movements of products & materials.
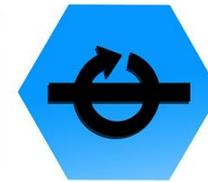
Inventory
Excess products and materials being processed.

Motion
Unnecessary movements by people (e.g. walking).

Extra Processing
More work or higher quality than is required by the customer.

Figure 1: The 8 DOWNTIME wastes

A Brief History of Improvement

Finding the simplest, easiest way to do something doesn't sound like it should be a rare idea. It is common sense, after all. But as we know, common sense isn't that common.

In 1921, the husband-and-wife team of Frank and Lillian Gilbreth, a pair of industrial engineers, first presented the idea of Process Charts in a talk titled **First Steps in Finding the One Best Way**.

As part of their way of finding the best way, Frank and Lillian went around recording the actions of persons performing tasks and devised ways to improve and decrease waste by mapping out the process. This eventually led to a standardized way to find what could be done to improve productivity. That is, they created process charts to describe the actions of the persons studied and find ways to improve their efficiency.

Examples of the efficiency improvements found by Frank and Lillian include:

- They were the first to suggest an "instrument caddy" for surgeons. That is, a second person that would stand by the surgeon and assist them with getting their next instrument, something I'm sure you have seen on a screen or in person multiple times.
- During World War I, they were put in charge of finding a quicker and more efficient way to assemble small arms, reducing the hand motions to just 17 basic motions and increasing the munitions factory output.

Their view was that every detail of a process is affected by every other detail. Therefore, the entire process must be presented in a way that it can be visualized all at once before any changes are made to it or any subprocesses.

The Gilbreth's process flowchart, with its symbols and graphics was then adopted by the ASME (American Society of Mechanical Engineers) as the standard process mapping and improvement practice for most of the American industrial engineering sector.

"I will always choose a lazy person to do a difficult job, because a lazy person will find an easy way to do it"

Frank Gilbreth

Mapping Processes

What the Gilbreth's started in the 1920's has evolved into business process mapping. In a process map, you draw out each step in a process and connect them with arrows to show the process flow and how each element connects to another. A basic process map to make a sandwich may look like this:

Be hungry → Get ingredients → Lay out ingredients → Assemble sandwich → Eat

Based on the type of process map, there are standard symbols that should be used for every action, decision, start, end, or documents created by the process. Here are the most commonly used ones:

Shape	Name	Use
	Activity	Represents a step or activity performed during the process
	Decision	Represents a decision that must be made during the process
	Start / End	Represents the start and end of the process
	Document	Represents a document, or data, that is given to people
	Arrow	Represents the connection between two other steps and the workflow direction

You can find the complete list of shapes at the end of this paper.

Mapping Types

While the Gilbreth's original idea of studying the process, mapping it out, and looking for ways to improve it are still common practice today, their process flowchart system has evolved with other mapping types developing to fit the need.

Within the process map types, there are process flowcharts, detailed process maps, cross-functional maps, value stream maps, and SIPOC maps.

Process Flowchart

The original process flowchart designed by the Gilbreths focuses on layout out processes in a visual, easy to use, easy to understand map that flows from the start to the end.

Process flowcharts are normally used:

- When planning new projects
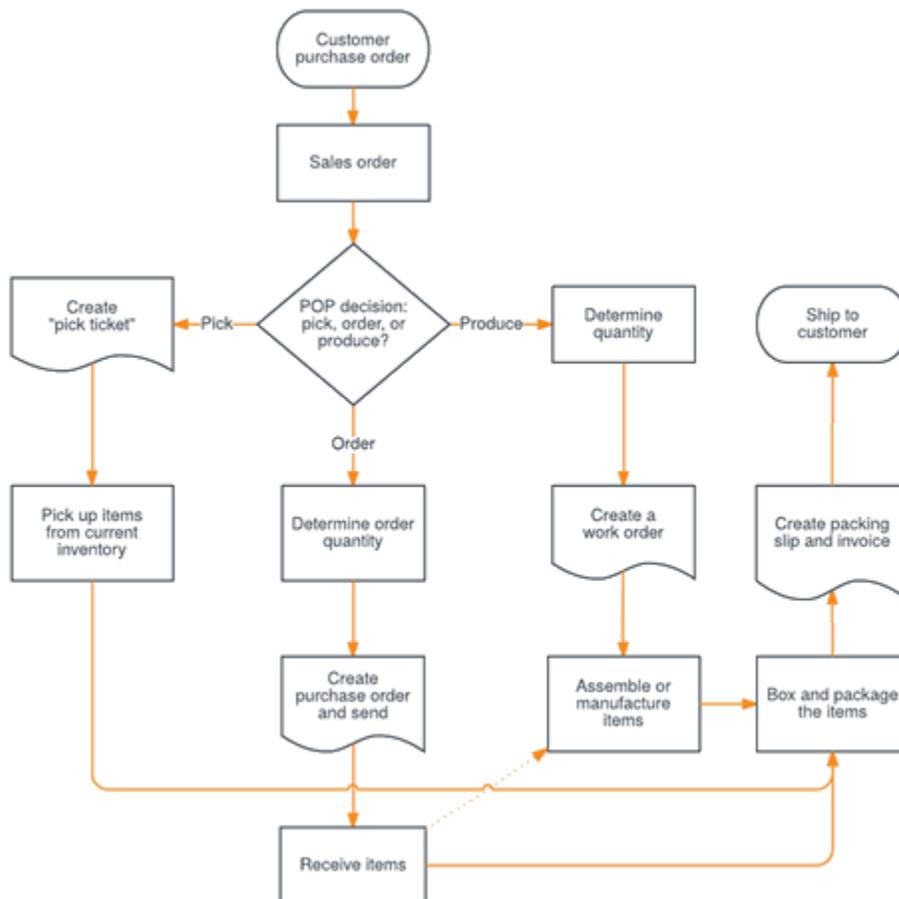- To model existing processes for review and modifications
- To analyze workflows

Figure 2: Process Flowchart example

Value Chain Maps

Value chain maps are high-level process maps that give you a top-down view of a process. Value chain maps show the main actions for the process but without adding detail on decisions, persons involved, etc.

Value chain maps are normally used when designing a business process to define and identify key actions and details of the process.
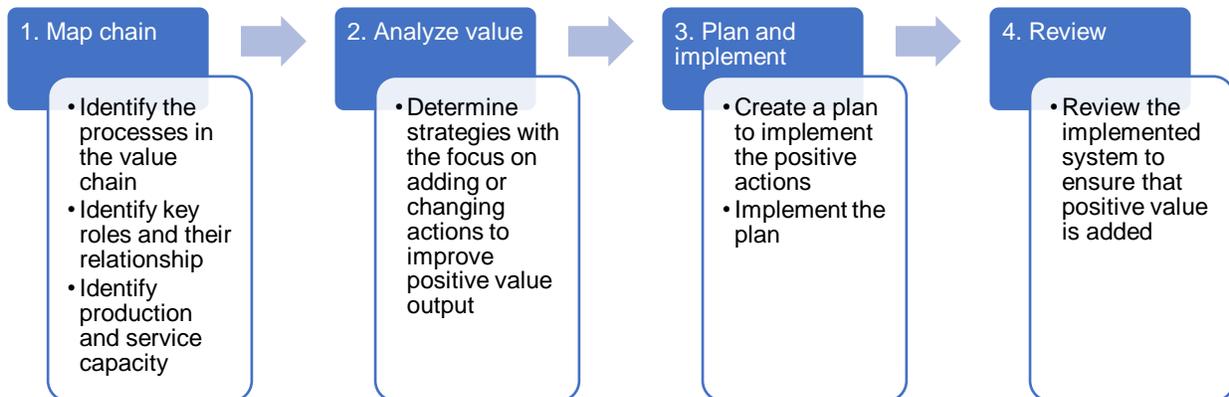
1. Map chain
- Identify the processes in the value chain
- Identify key roles and their relationship
- Identify production and service capacity

2. Analyze value
- Determine strategies with the focus on adding or changing actions to improve positive value output

3. Plan and implement
- Create a plan to implement the positive actions
- Implement the plan

4. Review
- Review the implemented system to ensure that positive value is added

Figure 3: Value chain map example

Swimlane Diagram

Swimlane charts show the relationship between an action in the process and the persons or groups that affect that action. They are sometimes referred to as deployment flowcharts or cross-functional maps.

Swimlane charts are normally used:

- When you need to identify the roles responsible for parts of the process and their interrelation
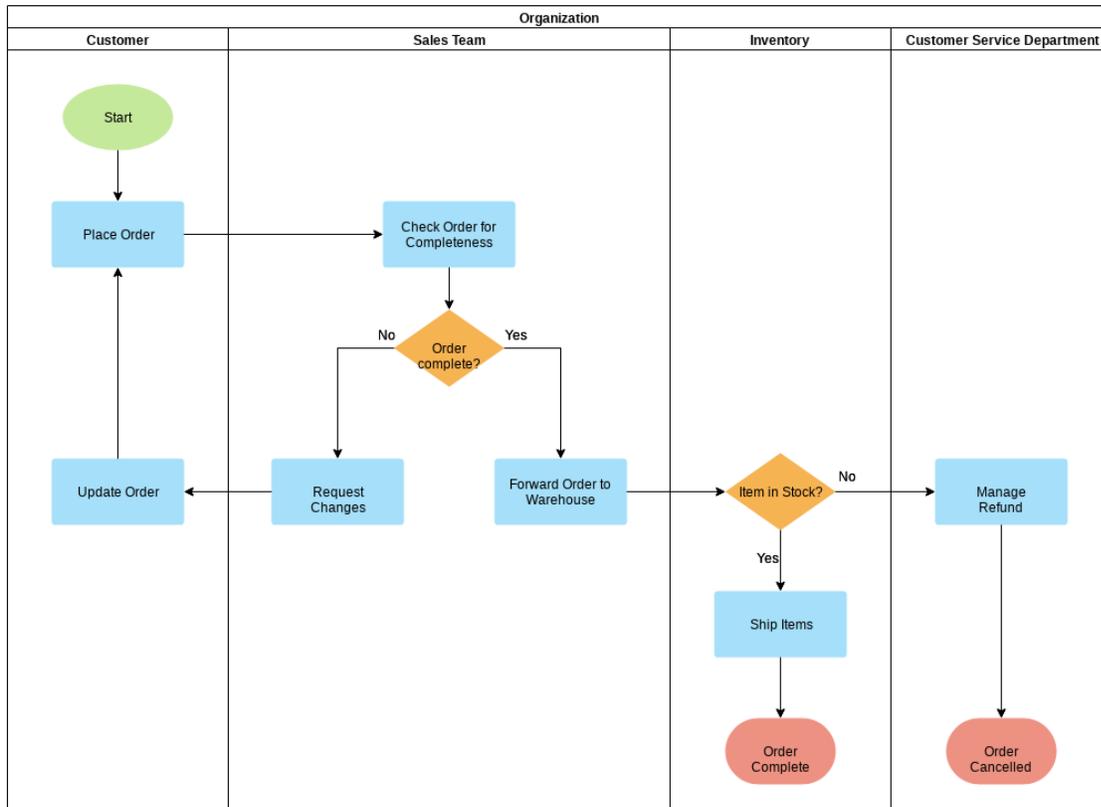- To show how a process moves between business units
- To identify potential waste

Figure 4: Swimlane Diagram example

SIPOC Diagrams

The SIPOC diagram focuses on the Supplier, Inputs, Processes, Outputs, and Customer of a process. This is a simplified map that only displays the basics of the process and those involved. This allows a focus on key process elements.

SIPOC diagrams are normally used:

- When you need to identify the elements of the process before creating a more detailed map
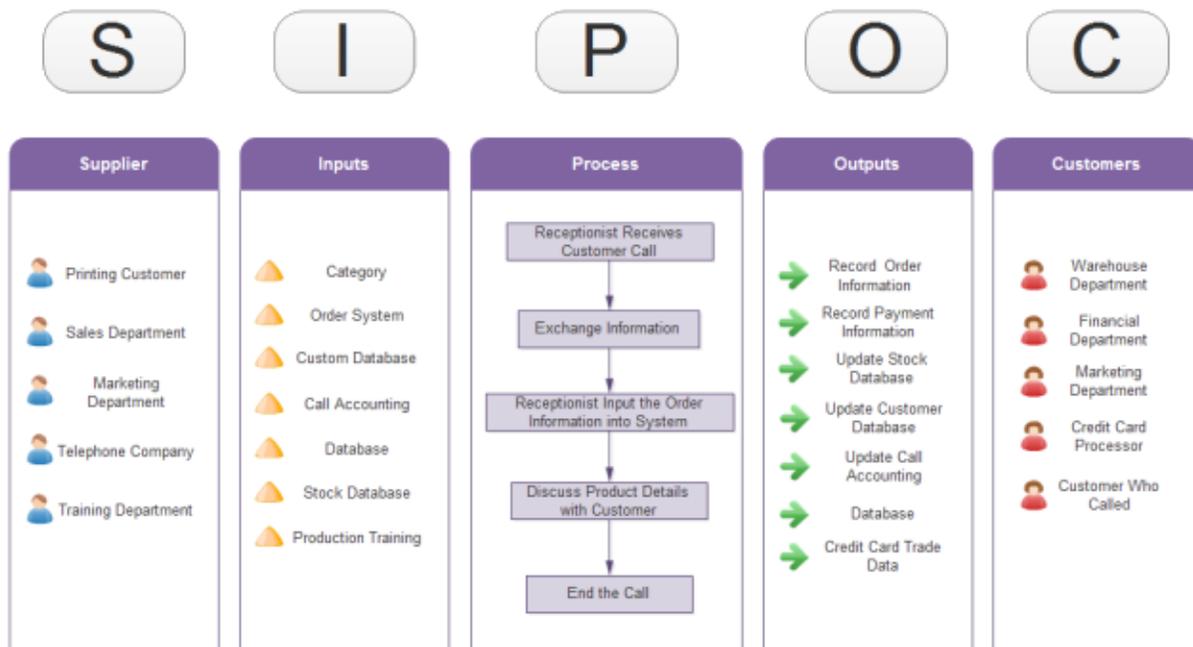- To define process scope

Figure 5: SIPOC Diagram example

Value Stream Map

Used in LEAN and six sigma methodologies, the value stream map requires some training to be able to analyze at a glace while containing more information that grants an in-depth visual of the process.

Value stream maps are normally used:

- To record process inputs and output values
- To identify potential waste
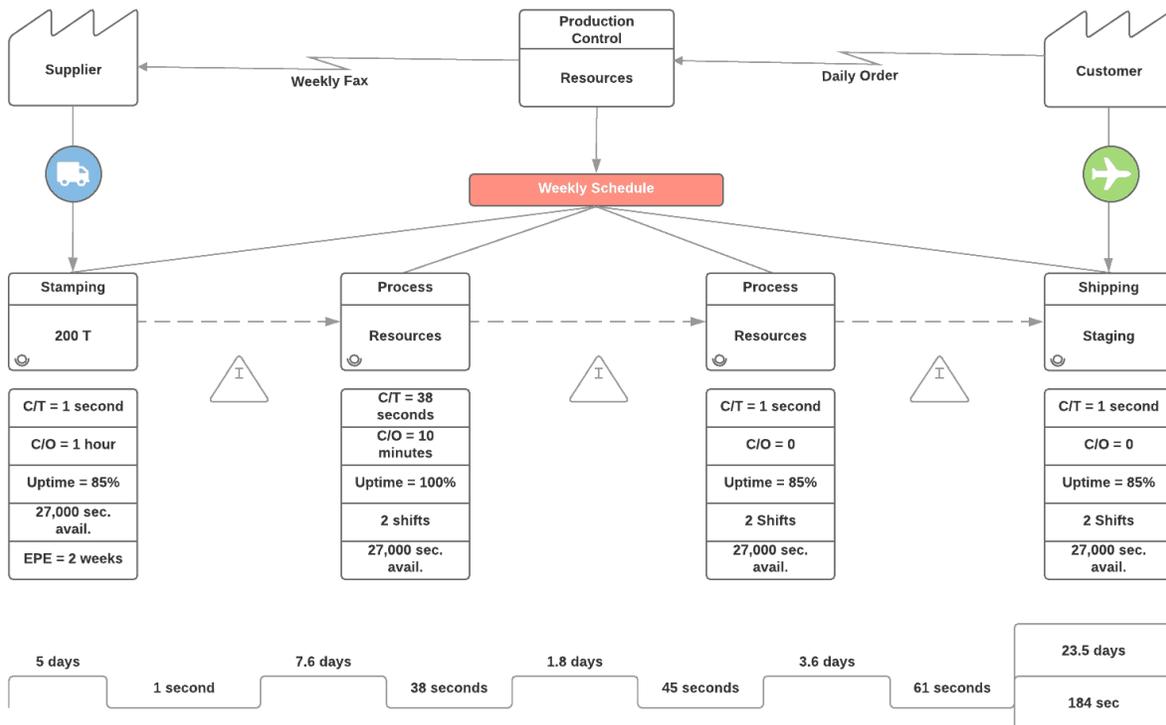- To manage and improve the process workflow

Figure 6: Value Stream Map example

It should be noted that the types of process map listed here are essentially the natural growth of the original flowcharts designed by the Gilbreths.

Creating Process Maps

Now that you know the most common type of process maps, you are ready to map your business process. In the simplest terms, mapping a process requires that you:

1. Identify the process
2. Gather resources and information
3. Draw the map

Once the map is created, you can use the map to:

4. Analyze the map for improvements
5. Plan the improvements
6. Implement improvements
7. Review the process for regular refinements and update the business process map

A few key items to keep in mind when creating process maps:

- Identify the process start and end steps first. This will help you and your team set the limits on what process is being mapped.
- Make the map simple to read so that it is accessible to anyone at your company.
- Keep the map details down to only key information.
- Use the standardized process map symbols to improve accessibility.
- Share the process map with key stakeholders regularly to ensure that relevant data and actions are accounted for.
- If possible, use business process mapping software to simplify recording, sharing, and updating the process map.

Identify the process

This is pretty straight forward but can still come with its own set of questions:

- What process are you going to map? Where is the start and end?
- Is this part of a global rethinking for your company or for small refinements?

Gather resources and information

Once you know the process and what the end goal is, you are ready to assemble a team to build the map and gather information related to the process. Things to consider:

- Does the team include key stakeholders for the process?
- Where are the inputs and outputs for the process?
- What actions taken on the inputs?
- Who does what? When? Where? How?

Be sure to record the sequence of actions taken on the process.

Draw the map

Having gathered the data, create the business process map. To ensure clarity, place the steps in sequence either from right to left, or top down.

With the map drawn out, you are ready for the next phase of the business process map.

Analyze, Plan, Implement, Review

With the map created, analyze the steps taken and determine if any actions are larger than they need to be, unrequired, or counter-productive. Once you know what needs to be changed, create an implementation plan to effect the desired changes. Then, you just have to implement the plan and review the end result to ensure that your desired changes are having the desired positive effect on the process.

The main goal of this part of the business process map is to find DOWNTIME waste and modify the process to cut it.
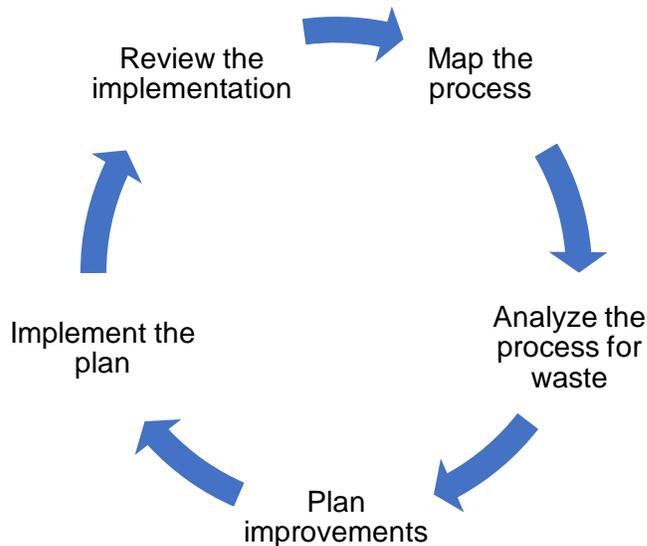
Figure 7: Simplified Business Process Map lifecycle

Like many other manufacturing techniques tied to LEAN, business process mapping becomes a virtuous cycle of constant process improvement with waste being shed with every turn of the wheel.

Other benefits of Business Process Mapping include:

- Clearer process definition for your whole enterprise, leading to faster understanding for all affected groups
- Required for many standards and certifications
- Improves documentation and training materials
- Improves role and responsibility clarity for groups involved and other stakeholders
- Improves user engagement for process improvement and makes waste easier to spot
- Improves team performance and job satisfaction
- Improves process efficiency measurability
- Can be used to model future scenarios
- Can be used to market how your company is efficient and reliable to investors and clients

Conclusion

All of these process map types have been or can be easily digitized, though many project managers prefer to use a written chart for easy access. However, new software tools and decreases in the cost of hardware have made creating business process maps, and updating any data on them, a simple process with easy visuals on larger screens. There are also benefits to creating your business process map on a digital record, such as:

- Tracking the process after it has been modified
- Tracking issues created by process changes, such as negative feedback, bottlenecks, or missed deadlines
- Remote access to the map for process teams and stakeholders

In summation, a good business process map starts by recording what you are doing and allows you to engage in process improvement or re-design to help keep your company productive and competitive.

Where OnRamp Helps You

OnRamp is a single point database ERP system that was designed from the ground up to touch all your business units and improve their processes and communication with each other.

Added to our best-in-class ERP is our dedicated business process mapping tools that allow you to enter your processes and track changes to them. Not only that, but since OnRamp digitizes many of your processes, all the changes made can immediately be felt within OnRamp. All this in one system. This means no paper copies, no added IT systems, no flowchart vendors or outside project management consultants, no messy 3rd party plug-ins, and no added costs. All your data instantly shared with all your business units. And to help you get started quickly and with your best foot forward, OnRamp's consulting team has decades of combined experience in manufacturing and implementing proven management methodologies that will improve your bottom line. Whatever you make, we can help you make it better.

We know manufacturing.

And we want to work with you to **make it better**.

OnRamp's ERP software can help to:

Improve Customer Service   **Increase Productivity**   **Reduce Costs**   **Increase Profits**

Here are some of the things that OnRamp can help you improve:

Production floor:
- Warehouse management system
- Storage system management
- Production planning
- Order policy suggestions
- EOQ calculations
- Inventory management
- Shipment management
- Work order management
- 5S audits
- MRP
- Finite scheduling
- Maintenance management, including preventative maintenance management
- Worker skill management
- Plant issue/ suggestion tools
- Detailed capacity planning
- Gateway queues
- Work center scheduling
- Online inspection software
- Task automation
- Quality management system
- Scrap management
- Quality alerts
- Shop monitors with production entry capacity
- Engineering document and drawing management

Front office:
- A single database for all records
- Paperless approval and sign-off
- Customer request management
- Easy to access files and data
- Team communication tools
- Paperless accounting
- Lead time and inventory management
- Vendor relations portal and management
- Customer relation management
- Project management and approval
- Training and skills gap analysis
- Notification systems
- Server run software with a locally installed shell
- Customizable reports and documents

Process Mapping Symbols

These symbols can be found in the shapes menu of most modern word processors.

Basic Symbols

Shape	Name	Use
	Activity	Represents a step or activity performed during the process.
	Decision	Represents a decision that must be made during the process.
	Start / End	Represents the start and end of the process.
	Document	Represents a document that is given to people.
	Arrow	Represents the connection between two other steps and the workflow direction.

Process/ Operations Symbols

Shape	Name	Use
	Predefined Process / Subroutine	Represents predefined processes or subroutines.
	Alternate Step	Represents an alternate step to the normal process flow.
	Delay	Represents a delay or a pause before the process flow continues.
	Manual Loop	Represents a required manual stop to automated steps.
	Preparation	Represents an item that needs to be modified or adjusted before the process can continue.

Data Processing Symbols

Shape	Name	Use
	Collate	Represents a step where data is organized in a certain way.
	Sort	Represents a step where data is sorted in a set order.

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Branching and Control of Flow Symbols

Shape	Name	Use
	On-Page Connector	Represents a jump from one connector to another, usually labelled with capital letters. It can also be in reference to an inspection point in the process flow
	Off-page Connector	Represents a process that flows onto another page.
	Merge	Represents the merging of multiple processes into one. It can also be in reference to the storage of raw materials.
	Extract	Represents a process that splits into different paths. It can also indicate a measurement when an M is added inside the symbol. Finally, this can also indicate the storage of finished goods.
	Or	Represents a process divergence. Label the out-going flow lines to indicate the criteria to follow each branch.
	And	Represents merging processes, but it is more used for data processing flowcharts.

Input / Output Symbols

Shape	Name	Use
	Data	Represents the inputs and outputs of the process.
	Multiple Documents	Represents when the output is multiple documents, though it is rarely used.
	Display	Represents when information is displayed to the user, normally on a display screen.
	Manual Input	Represents when a person must manually enter data.

Data Storage Symbols

Shape	Name	Use
	Stored data	Represents when a process stores data.
	Database	Represents a database.
	Direct Access Storage	Represents a disk or hard drive.
	Stored data	Used on programming or database flowcharts to represent data stored in memory instead of to a disk.