

# Process Mapping and Value Stream Mapping

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# Process mapping

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- A process map is a visual representation of the process step by step (in sequence)
- It serves as a tool in lean manufacturing to understand the current status of the process in steps
- It helps the management to identify the steps in process which adds value to the customer and those do not add any value.
- It is used to identify the boundaries of a process where the measurements are important.

# Why to prepare process maps?

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- Whenever an organization wants to understand a process, it is necessary to prepare a process map depicting the entire sequence of the process from beginning to end.
- It is also used to diagnose any problems existing in the process
- It can be used as a tool during training

# Advantages of process mapping

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- It helps to understand the current process and to identify the improvement opportunities
- Process map identifies the actual paths revealing areas of risk and potential solutions by communicating process related ideas, information
- It makes the team to brainstorm each of the process steps, clearly identify the wastes in the process and decide on the future process map
- To clearly identify the improvement
- As a visual training aid to train the personnel in the improved process

# Types of process map

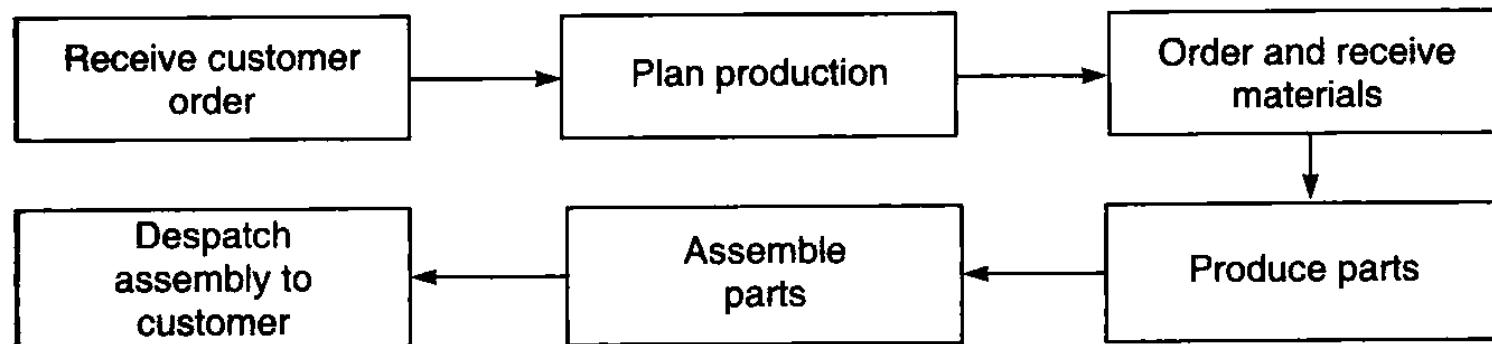
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## High-level process maps

- It gives a bird's eye of the entire process.
- Provides only the major steps in the process
- It is the real starting point of any process study
- It helps to establish the scope of the process and identify the significant issues

# High-level process map

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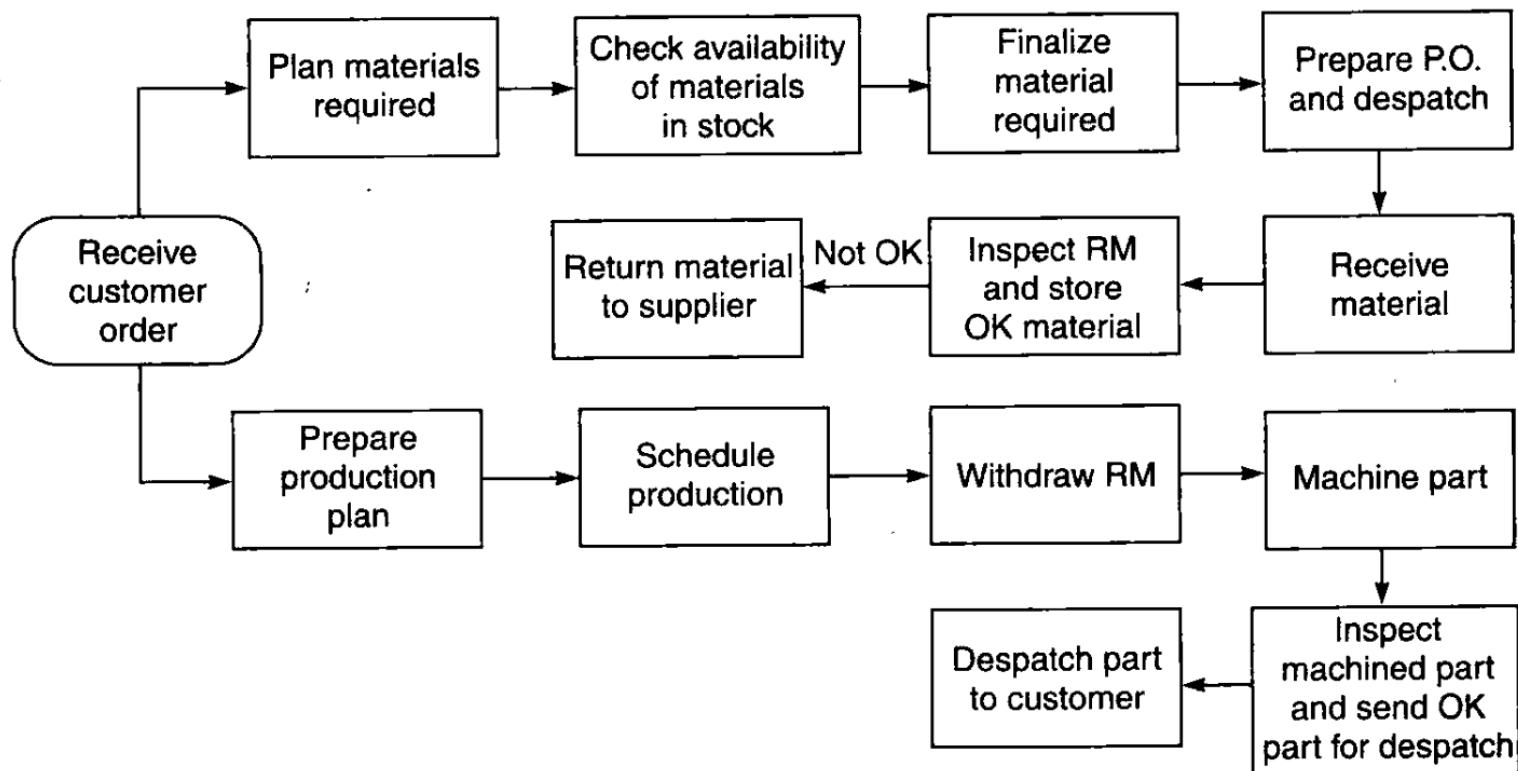


# Detailed process maps

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- It shows each and every step involved in the process
- It has a starting point and an ending point
- It indicates the input for each process and output from the process

# Detailed process map



# Constructing a process map

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A process mapping team (PMT) has to be formed consisting of lean leader, process owner and associated departments.

PMT should prepare the high level process map

1. Determine the boundaries- Starting and Ending points
2. List the steps – Various process steps must be written. Steps must be short sentences which start with a verb
3. Sequence the steps – use post-it notes so as to move tasks
4. Draw appropriate symbols

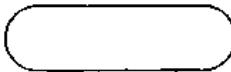
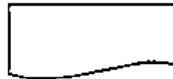
# Constructing a process map

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5. Draw process map using a computer
6. Check for completeness
7. Finalize the process map
8. Analyze the process map to identify the waste
9. Prepare the revised process map
10. Calculate the savings and publish

# Symbols used in Process mapping

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Symbol	Process
	Start/End of activity
	Activity
	Decision
	Delay
	Document

# Value Stream Mapping

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- VSM is a tool to visually indicate all actions required to bring about a product or service in logical steps from start to finish
- It shows all the actions required to complete a product or service through to the customer
- The purpose of VSM is to understand the value flow
- VSM helps in understanding how the product flows from when the customer orders to the dispatch of the product to the customer
- It helps to identify the steps that add value to the customer and do not add value to the customer

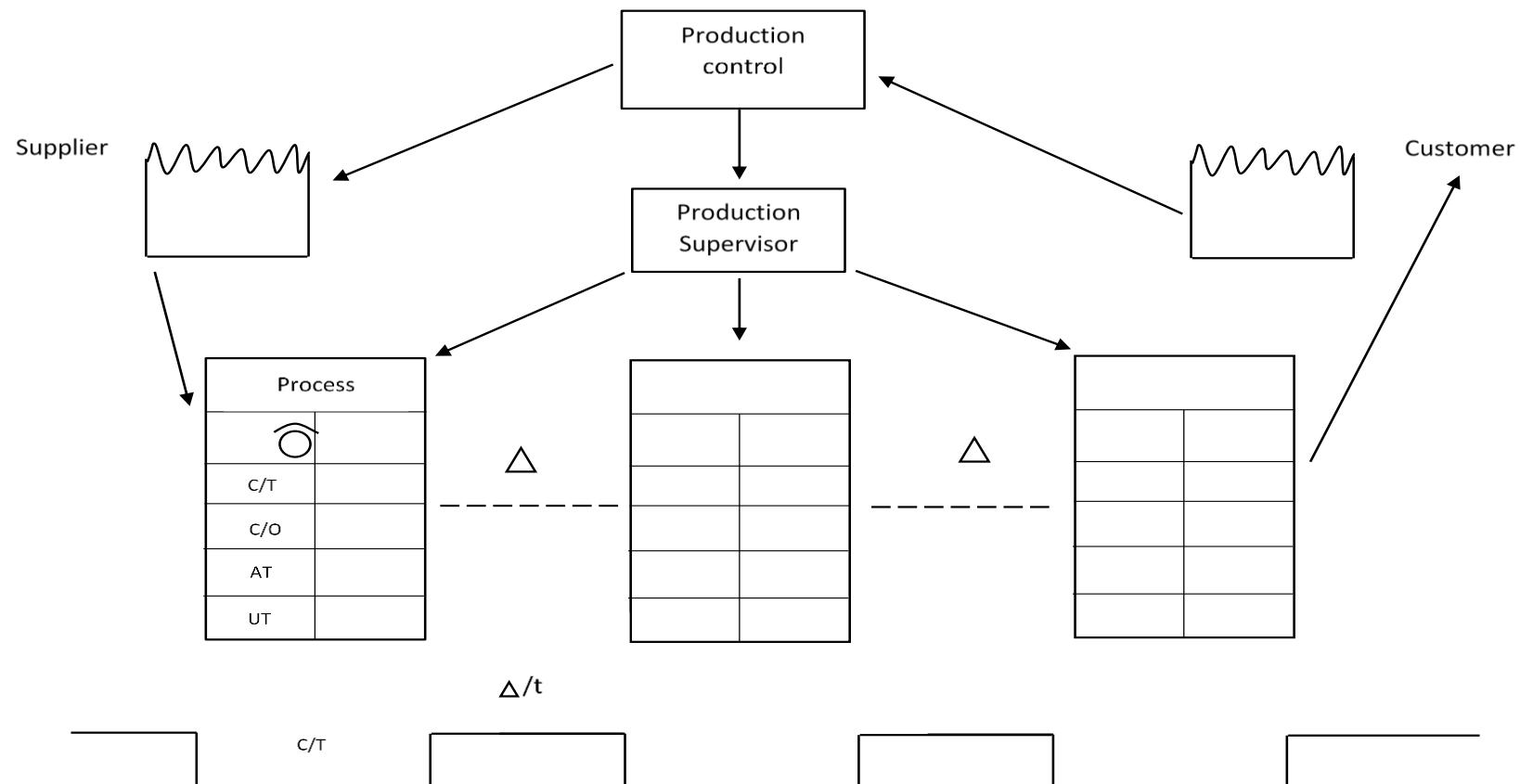
# Value stream mapping

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VSM graphically depicts the following:

1. Each process or activity
2. Inventory or queues between the steps
3. Set up times, cycle time
4. Timeline for the whole value stream
5. Information flow from customer through the production process
6. Picture of the complete process
7. Changes needed to be implemented

# Format of VSM



# Steps to be followed while preparing the VSM

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- 1. Understand the current status and prepare the current state mapping**
- 2. Preparing the current state of the process helps in the following**
  - I. Communication
  - II. Understand the existing state
  - III. View the work from the a process perspective
  - IV. Understand the magnitude of the change planned
  - V. Understand the tasks required to move from the current process to a new process
  - VI. Ensure problems are not repeated
  - VII. Measure the new process on performance base line

# Preparing current state map

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- A product or product family should be selected so that the task is manageable
- Value stream map should not be drawn for multiple product lines
- Both material flow and information flow must be mapped

# STEPS:

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- I. Document customer information/Demand
- II. Complete a quick walk through to identify the main processes
- III. Map the basic production process
- IV. Define the data to be collected
- V. Collect and map the data
- VI. Document supplier information
- VII. Establish information flow
- VIII. Identify where the material is being pushed
- IX. Quantify production lead time versus processing time

## 2. Collect the data

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**Cycle time(C/T):** The time that elapses, in sec/min, between one part coming off the process and the next part coming in.

**Changeover time(C/O):** The time to switch from producing one product type to another

**Available work time:** the amount of work time available per shift in each process

**Up time:** the amount of time the machine is running

**Value added time:** the time spent transforming the product in a way that the customer is willing to pay for

**Lead time:** the time it takes for one piece to travel through the entire value stream from start to finish

**CD:** customer demand in quantity per month

# Data collection

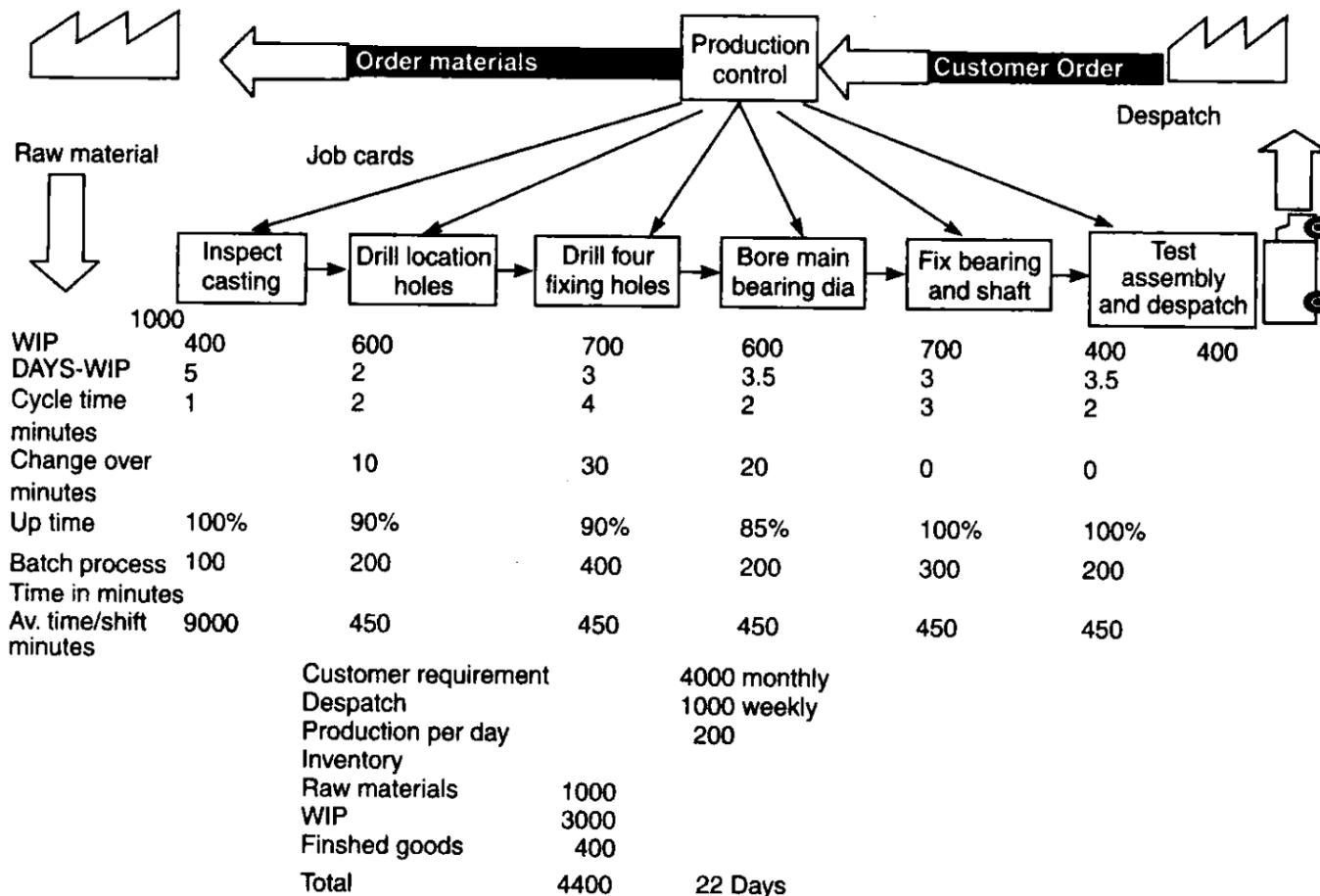
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- Data collection must be taken in multiple shifts
- Collected data must be arranged in an information box

# 3. ARRANGE data in an information box

Part number	WP/CAS/001		WP casting
Family	Casting	Shop	Mach.shop
Customer demand	4000/month	Variation	+400
Manufacturing data		Operation	10
Data collected by		Sundar	20/7/08
Cycle time	2		Minutes
Change Overtime	20		Minutes
Uptime	90%		
% Defective	5%		Rework
Batch size	110		10 numbers added to demand
Number of shifts	2		8.5 hr/shift
Number of operators	1		Per shift
Available time	450		Minutes
Work in progress	650		Numbers

# 4. CURRENT STATE MAPPING

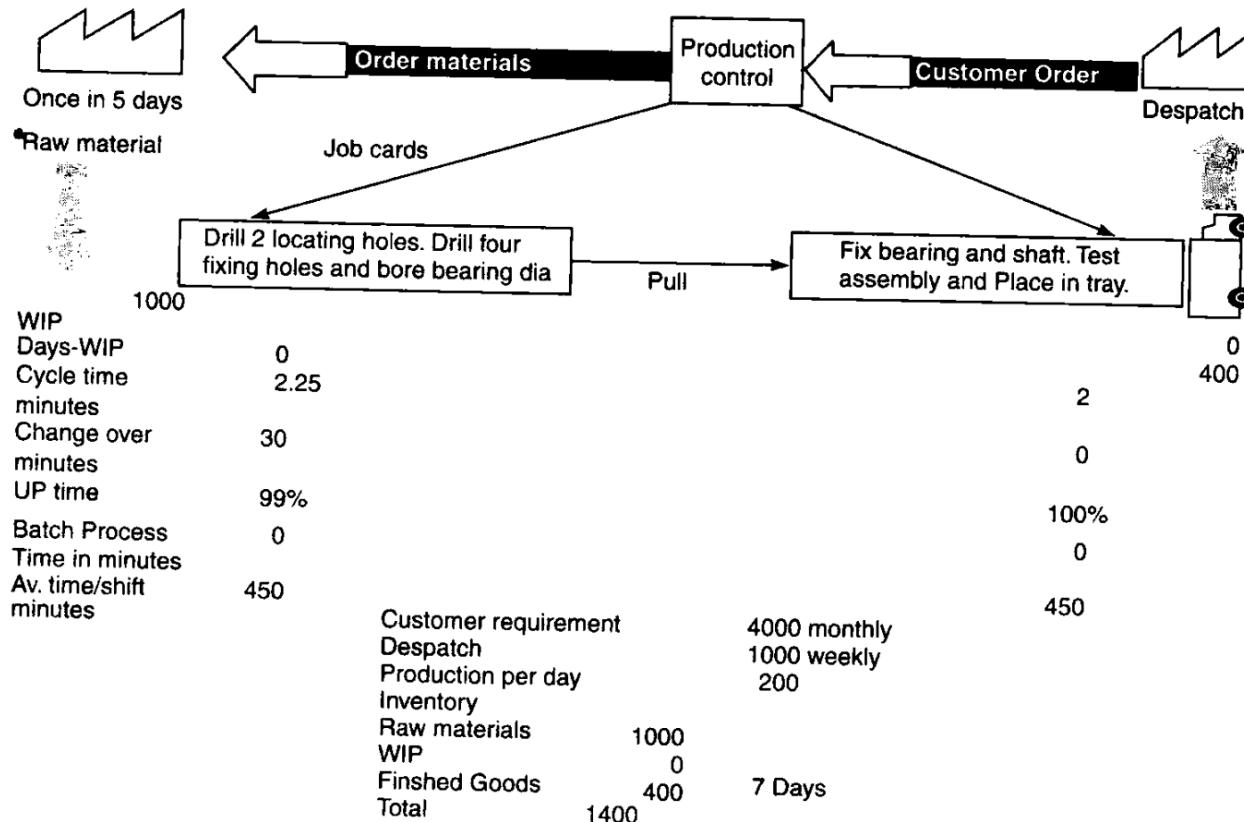


# 5. Analyze the map

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- Identify which activities are “non-value adding”
- Understand customer requirement
- Recognize supplier capabilities and constraints
- Calculate the current inventory/WIP
- Compute the Takt time and determine what prevents us in producing the same
- Make sure there is continuous flow and if possible make it as a single piece flow
- Balance the line
- Make a future state drawing

# 6. Future State Mapping



# Results- after implementing the future state map

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- The number of operations reduced from six to two
- Operators reduced from six to one
- Inventory reduced from 22 days to 7 days
- Space reduced by 60%
- Lead time is also reduced
- Quality improved since the operator is able to detect defects immediately
- Supplier quality is also improved.

# THANK YOU

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