LEAN Management

Value Stream Mapping Process

Introduction

To reduce the stress at workforce, the lean system implementation needs discipline of high degree.

For this,
- Operators and supervisors require high level of co-operation and trust between themselves.
- When a lean system is implemented, reward systems and classification of labor must often be revamped.
- Changes in existing layouts are required.
- Extended periods of daily production schedules in high volumes and make-to-stock environments must be stable.
- Small lot sizes must be used for the inventory advantages of a lean system.
- Frequent small shipments of purchased items that cannot be arranged with the suppliers and large inventory savings for these items cannot be realized.

Learning Objectives
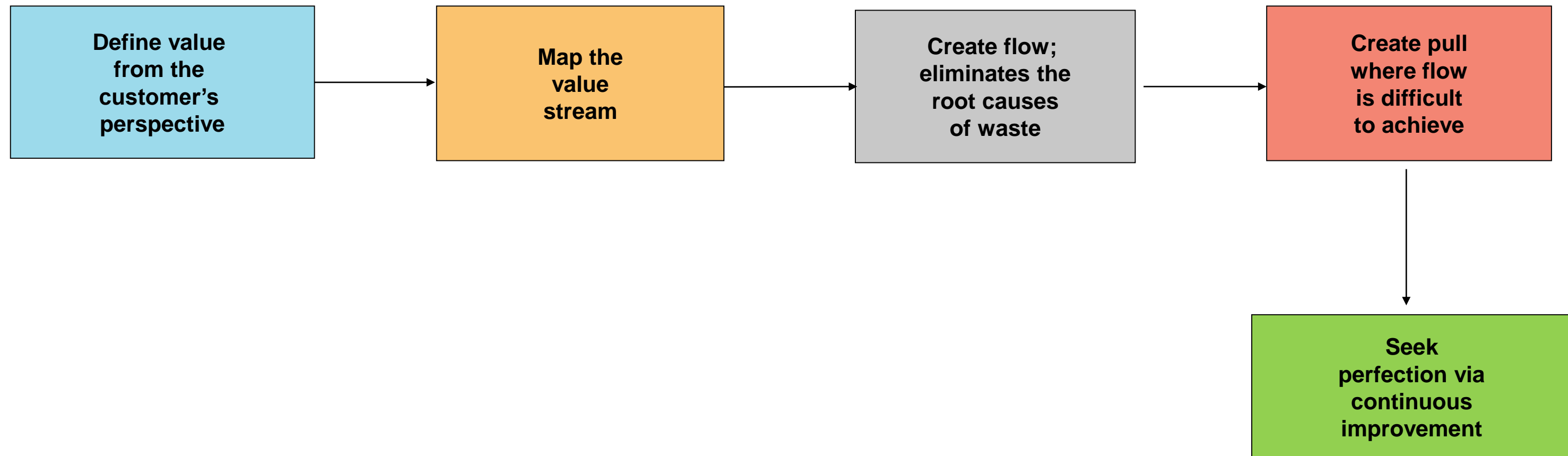
At the end of this lesson, you will be able to understand:

✔ Overview of Value Stream Mapping (VSM)

✔ VSM principles and Suppliers, Inputs, Process, Outputs, and Customers (SIPOC) process map

✔ VSM review in current and future state

✔ Implementation and excellence road map
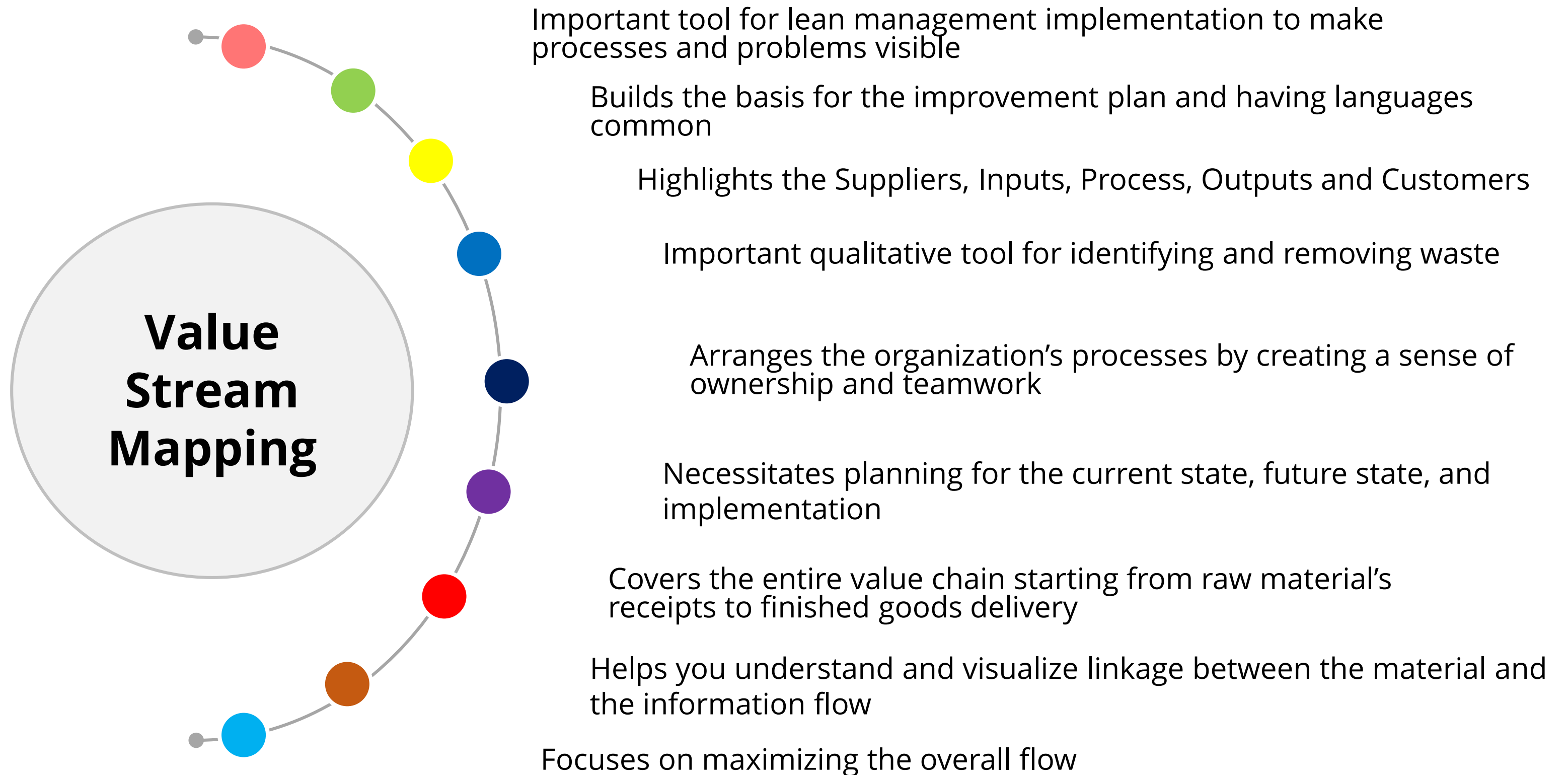
Overview—Value Stream Mapping

What is Lean Process?

A process is lean when it:

➢ Is driven by customer needs and mainly focuses on activities that the customer is willing to pay for
➢ Runs smoothly without delays or interruptions
➢ Produces only what is needed and when it is needed
➢ Has standardized and automated tasks and eliminates unnecessary activities

Define value from the customer's perspective	→	Map the value stream	→	Create flow; eliminates the root causes of waste	→	Create pull where flow is difficult to achieve

Seek perfection via continuous improvement

Benefits of Value Stream Mapping

Value Stream Mapping

Important tool for lean management implementation to make processes and problems visible

Builds the basis for the improvement plan and having languages common

Highlights the Suppliers, Inputs, Process, Outputs and Customers

Important qualitative tool for identifying and removing waste

Arranges the organization's processes by creating a sense of ownership and teamwork

Necessitates planning for the current state, future state, and implementation

Covers the entire value chain starting from raw material's receipts to finished goods delivery

Helps you understand and visualize linkage between the material and the information flow

Focuses on maximizing the overall flow

Value Added and Non-Value Added Process

Value add is any activity the customer values and is willing to pay for. For value add, a process step should have these points covered

Value Add

Non-Value Add

Non-Value add is any activity that consumes time and resources without adding value to the service or product for the customer. These activities should be eliminated, reduced, simplified, or integrated.

Does the customer really care?

Does it bring any change?

Is it done right at the first attempt?

Is it required by law and regulations?

If necessary, check legal/regulatory requirements

If unnecessary, check waiting time, unnecessary processing, errors or defects, motion (people), transportation of products, and underutilized people and inventory

VSM Principles

Diagnostic Tool
Shows the hidden symptoms of bigger problems

Strategic Planning Activity
- Assists to prioritize opportunities for required improvement
- Helps in preparing an implementation plan

Macro-Level - Visual Representation
- Flow of information
- People and material flow
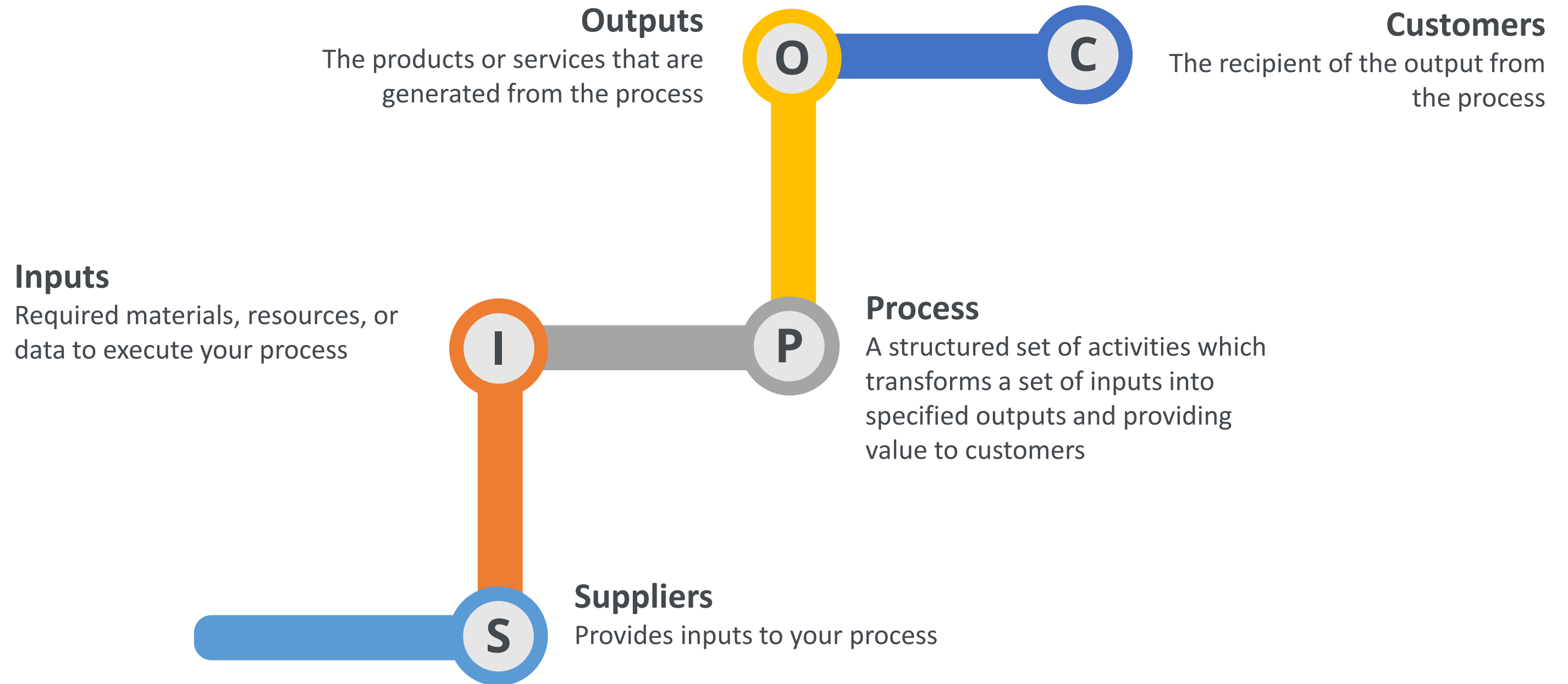- Every process block depicts a handoff or a break in the timeline

Relevant Metrics
- Lead time: Throughput/Turnaround/Flow time
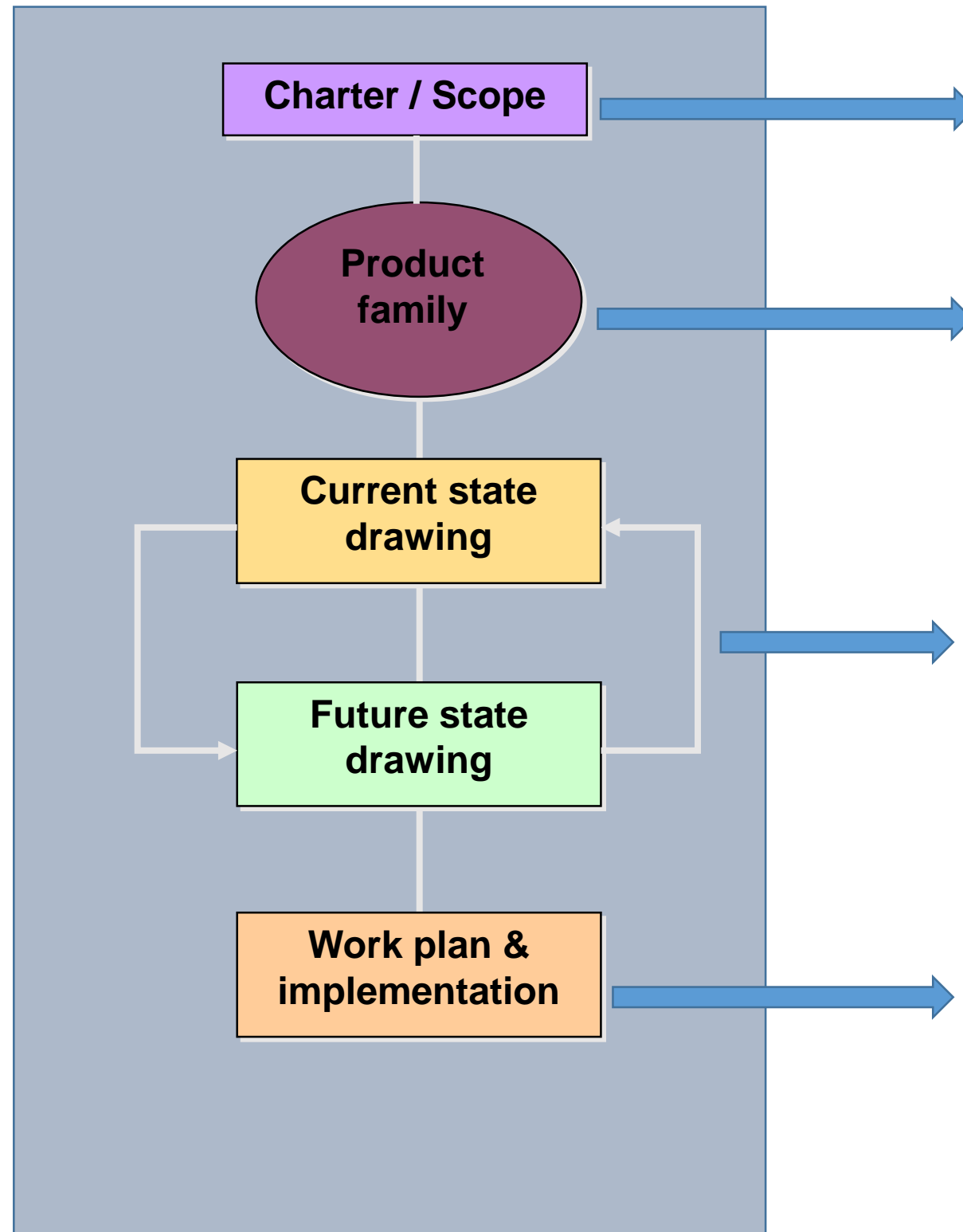- Cycle time: Touch/Process time

SIPOC Process Map

Outputs
The products or services that are generated from the process

Customers
The recipient of the output from the process

Inputs
Required materials, resources, or data to execute your process

Process
A structured set of activities which transforms a set of inputs into specified outputs and providing value to customers

Suppliers
Provides inputs to your process

simplilearn

Lean Glossary of Terms

- **Cycle Time:** It is the time to finish a single unit of production.

- **First Time Through:** It is the percentage of units completed and met the quality criteria the first time that they are processed.

- **Batch Size**: It is the size of a particular batch processed as a single unit.

- **Demand:** It is the average number of units complete per shift.

- **Takt time:** It is the average time between the start of production of one unit and start of production of the next unit.

- **Throughput Time:** It is the measure of the time required for a material, part, or sub-assembly to pass through the process of manufacturing followed by the release of an order to the manufacturing floor.

- **Value Added Ratio**: It is the total VAT/throughput time.

- **Process Ratio**: It is calculated as total process time/throughput time.

Challenges in Current Process

1. Lots of waiting and travel time

2. Lack of communication and skilled personnel

3. Too many handoffs, approvals, and workarounds

4. Lots of duplication of work

5. Lots of instances where work flow is on hold or lost (dead zones)

6. Broken interfaces which becomes ineffective or non-existent interfaces

7. Lost time due to employees looking for work and/or re-work looping back to correct errors

8. Low CT/LT ratio due to lots of waiting

9. Different prioritization rules with respect to different departments

10. High WIP due to waste in process like bottlenecks/backlogs

11. High lead time due to slow throughput/turnaround

simplilearn

Conceptual Overview

Charter / Scope

Product family

Current state drawing

Future state drawing

Work plan & implementation

1. **VSM Charter and Scope**
   - Process boundaries or scope
   - SIPOC
   - Roles and responsibilities

2. Start with a single product family

1. **Current and Future State**
2. Collect data on process and system
3. Being specific about how many finished part numbers in family and how much is demanded and how often.
4. Verify and repeat the process if needed

Develop implementation plan

Value Stream Mapping Charter

- Vision

- Mission

- Strategic Plan

- Improvement Objectives

- Drivers

- Critical Success Factors

- Process Description

- Start or End Date

- Management Information System

- Benefits Realization

- High Level Scope

- Process Champion

- Team Members

- Team Leaders

- Facilitators

- Roles and Responsibilities

- Risk and Tolerance

Define Boundaries

- Prior to launching on VSM, you can define the start and end points
  - Create as-is physical map: How and where from inputs to outputs
  - Create as-is geographical map: Areas where processes are performed
  - Add process control information flow to as-is physical map

- A logical startup point where the inputs cannot be returned to the preceding step.

- Capturing steps of how the processes are actually performed which may include workarounds, re-work, informal activities, feedback loops.

- In lean management, we generally define work-in-process that is something you cannot ship to the customer or return to the supplier.

- Add as-is process metrics based on counts and rates
  - Number of parts required by the customer
  - Number of operators and machines available to work on the parts required by the customer
  - Rates of the processes required to work on the parts

Value Stream Mapping Boundaries

Current State

- Describe boundaries/value
- Analyze tasks/flows of material and information between them and resources for each task and flow
- Create map for the current

Future State Design

- Visualize ideal state and design map for the future state
  - Recognize value added and waste from current state
  - Re-configure the process to eliminate waste/add value
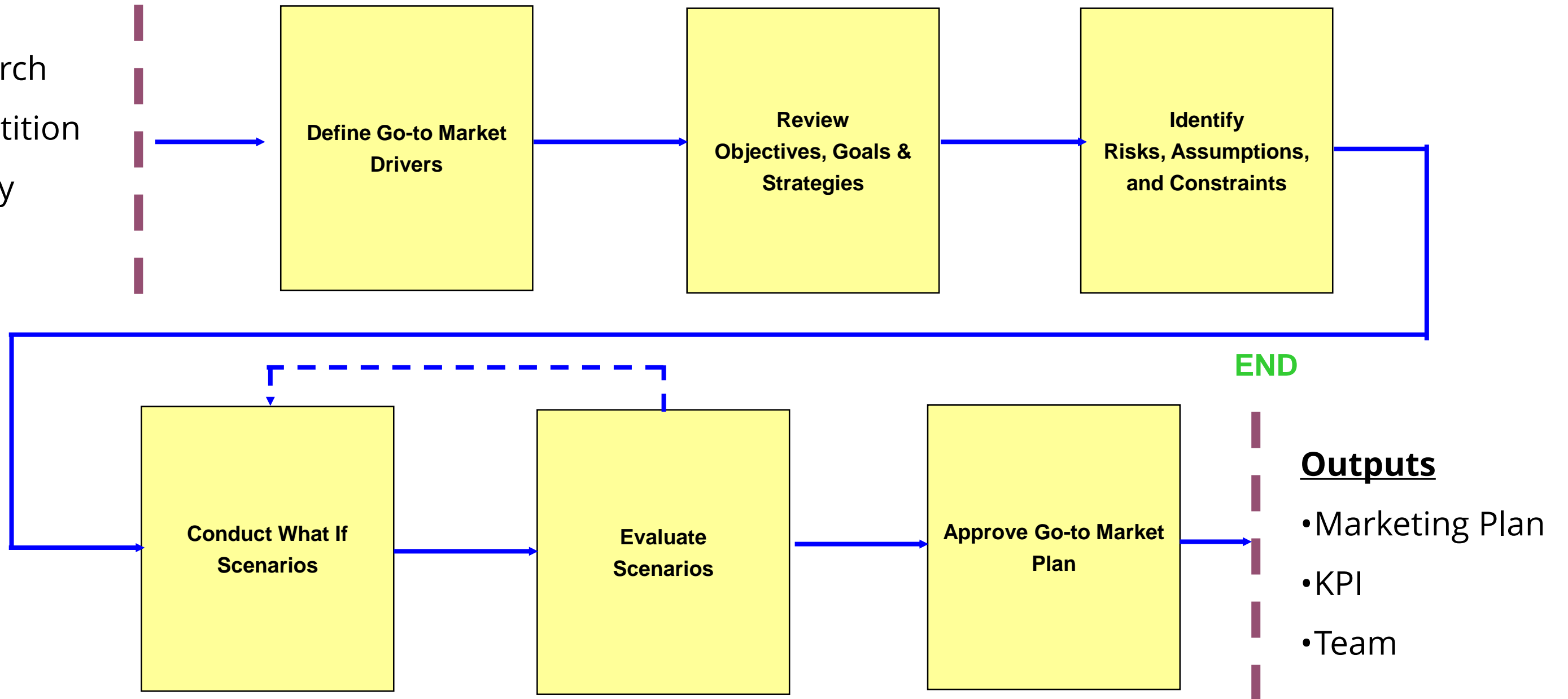
Implementation Plan

- Build action plans and track the actions plans

Boundary—Start and End Points Example

START

Inputs

- Market Research
- Data - Competition
- Firm's Strategy

Define Go-to Market Drivers

Review Objectives, Goals & Strategies

Identify Risks, Assumptions, and Constraints

END

Conduct What If Scenarios

Evaluate Scenarios

Approve Go-to Market Plan

Outputs

- Marketing Plan
- KPI
- Team

Material and Information Flow

- Utilize the scope document to map the product/service flow.

- Map the entire value stream by performing a walkthrough of the actual process and then collect information by starting with the final step and then walk backwards based on customer's perspective. Now, outline all the major process blocks and remove activities occurring before a handoff.

- Stay focused on the norm to be followed by using the 70% rule to avoid exceptions

- Retrieve information from workers to obtain data of cycle time and lead time

- Use stopwatch and avoid relying on information which is not personally seen

- Use pencil and draw by hand

Resource Identification

- VSM uses strategies in such a manner that the resultant implementation plan has a tactical component.

- Companies should nominate a VSM head who has the Top Management support with power to influence changes.

- The team composition should have:

  - Team and Process Leaders

  - Team members having in-depth process knowledge

  - Facilitators or management consultants

Data Collection

- Size of packs at each process
- Number of working hours and breaks
- Inventories based on location and size
- List of operations scheduled per week
- List of process cycle times
- List of overtime per week
- Number of instances of rework
- Number of scraps
- Information on downtime
- Demand rates by process (Takt Time)
- Number of product variations at each step
- List of shipping and receiving schedules

- List of activities
- Information about department performance
- List of IT systems used
- Number of people/operators
- Information on current backlog/WIP
- Information on demand rate
- Information on work time
- Information on prioritization rules
- Quality percentage (first pass yield)
- Information on batch size
- Information on run frequency
- Number of equipment available
- Cycle (touch) time (observed & effective)
- Changeover time and frequency

Design Future State – Blueprint

- Prepare a blueprint on how the plant will operate in future

- Apart from the waste/nonvalue add activities:
  - Understand if the process followed currently at each stage is necessary
  - Identify the impact when superfluous tasks are removed
  - Check if the process can be rearranged efficiently like a different flow layout or a new transport route can be introduced

- Validate all the demands of the customer

- Map the future state material and information flow

- Plan future state process flow

- Calculate the total product cycle time

- Detail all the off-line activities and outline a detailed implementation plan

Define Customer's Demand—Example

- Demand = 3200 pieces per week
  - Type L = 1000 pieces per week
  - Type S = 2200 pieces per week

- Plant Operation Schedule: 1 shift per day

- Packaging Per Day = 60 pieces per tray

- Shipment to Customer = 1 truck per day

- Shipment to Supplier = 1 truck per week