

## ✓ 4.7 Bottlenecking

### ✦ Meaning:

A **bottleneck** in production is a point where the **work slows down** because **one process or machine is slower** than the others.

Like the **narrow neck** of a bottle slows liquid flow, a bottleneck in a factory **slows product flow**.


### ⚠ Effects of Bottlenecking:

1. **Production Delays** – Slows down the entire process
2. **Low Output** – Fewer products made in a given time
3. **Increased Costs** – More time, labour, and resources used
4. **Idle Time** – Other machines/workers may wait for bottleneck to clear
5. **Customer Dissatisfaction** – Late deliveries or reduced quality.

### ✓ Ways to Reduce Bottlenecks:

Method	Description
Add Capacity	Use more machines or workers at the bottleneck stage
Improve Efficiency	Upgrade machines, train workers, use faster tools
Reschedule Work	Spread the workload evenly to avoid overloading one stage
Reduce Setup Time	Keep machines ready or switch tasks faster
Outsource Work Temporarily	Send some work to outside vendors to balance flow
Use Automation	Reduce manual work at bottleneck point

### ✦ Quick Example:

In a car factory, painting takes longer than assembling — so unpainted cars  at the painting stage.

 **Solution:** Add another paint booth or improve paint-drying time.

## Bottleneck