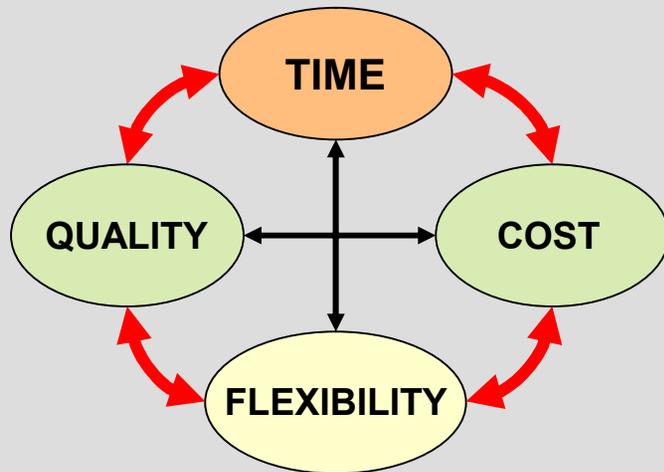


# Class 9: Production Control

**Production Control determines:**



- When work is performed
- What work is performed
- Who performs work

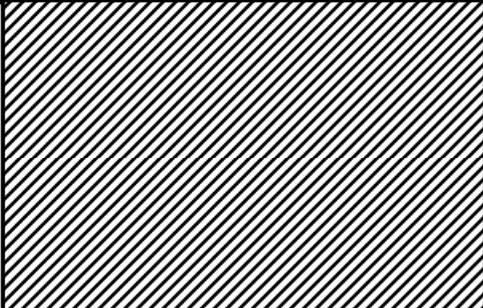


**Production Control is the nervous system of a business process**

# Key Definitions

- **Pull:** Work triggered by downstream (possibly internal) demand
- **Push:** Work triggered by a forecast of demand
- **Make-To-Order:** Work performed towards an existing (external) customer order
- **Make-To-Stock:** Work performed for a yet unknown customer

# Production Control Methods

<b>(this lecture)</b>	<b>Push</b>	<b>Pull</b>
<b>Make-To-Stock</b>	<b>MRP</b>	<b>(Q,R) &amp; (S,T)</b> <b>Kanban</b> <b>CONWIP</b>
<b>Make-To-Order</b>		<b>Priority Rules</b> <b>Scheduling</b>



# MRP Purpose

- **Coordination of Production and Inventory in large, multi-stage production systems**
- **Capacity planning, scheduling, supplier coordination**
- **Timely dissemination of information**
- **Synchronized production and procurement**
- **Central engineering and logistic database**

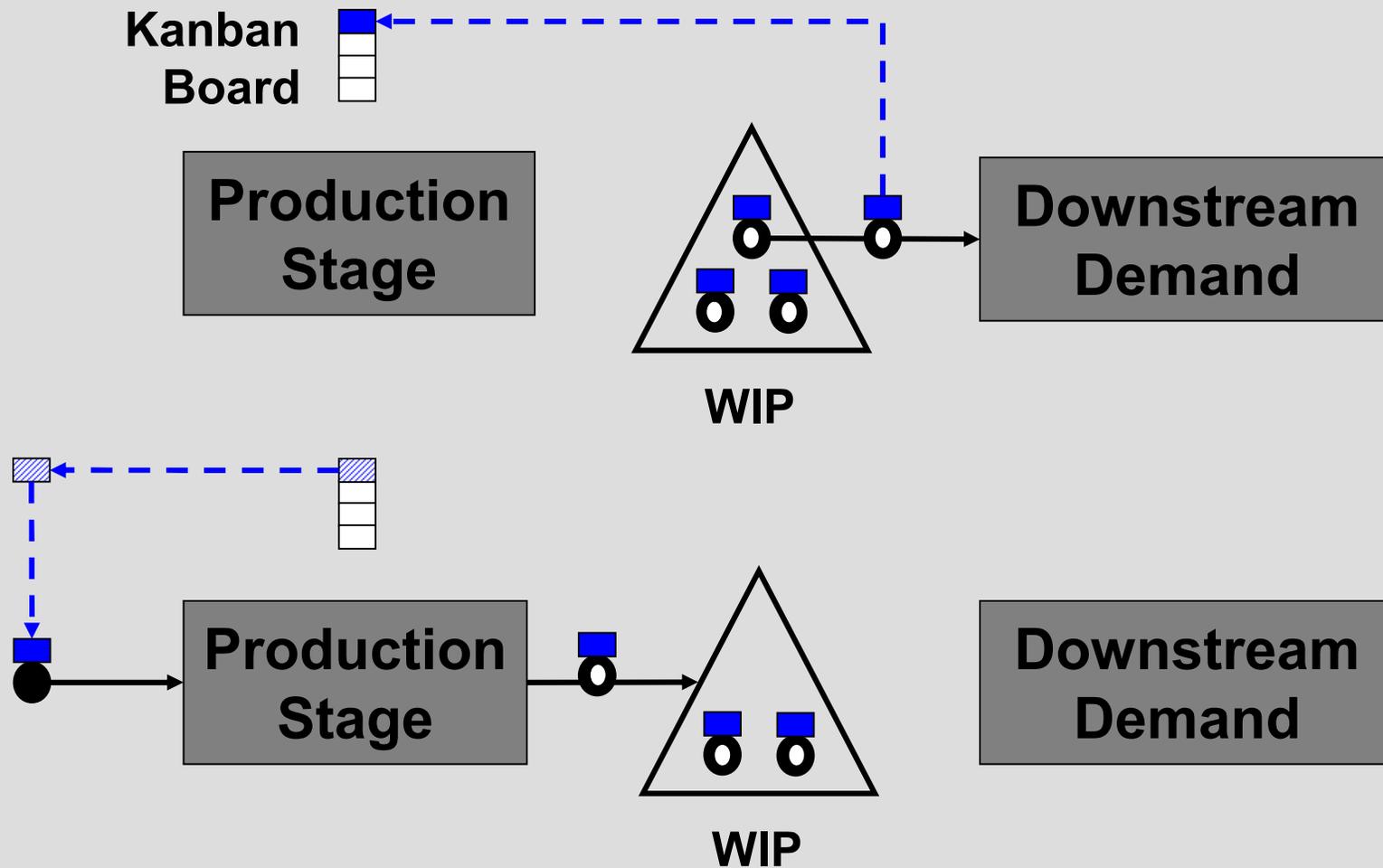


**ERP**

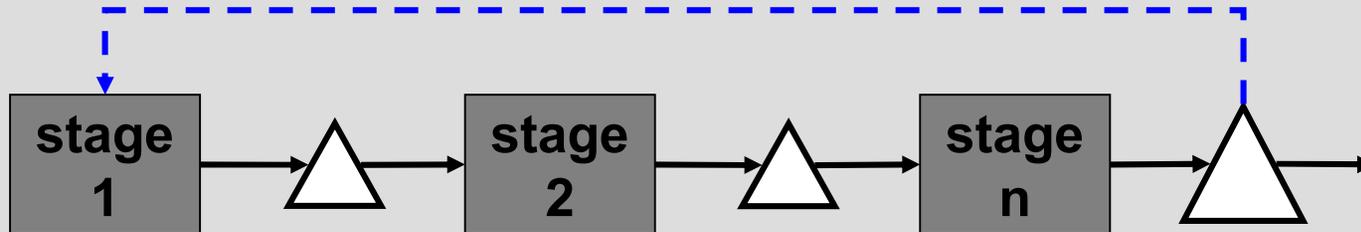
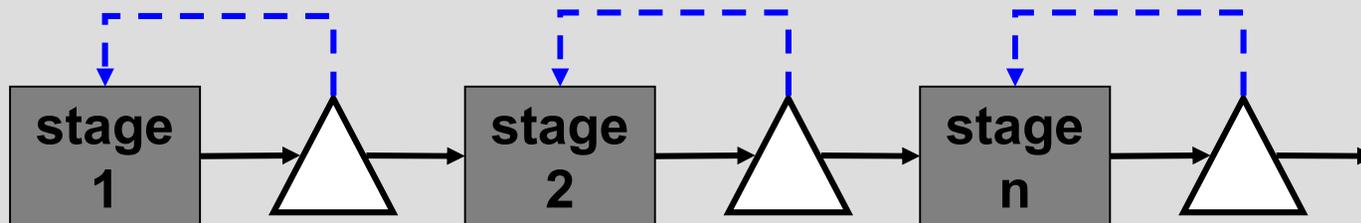
# MRP Problems

- **Deterministic model**
- **Large data requirements and GIGO**
- **Self-fulfilling lead-times**
- **Difficulty and cost of installation and maintenance**
- **Centralized command and control mindset**

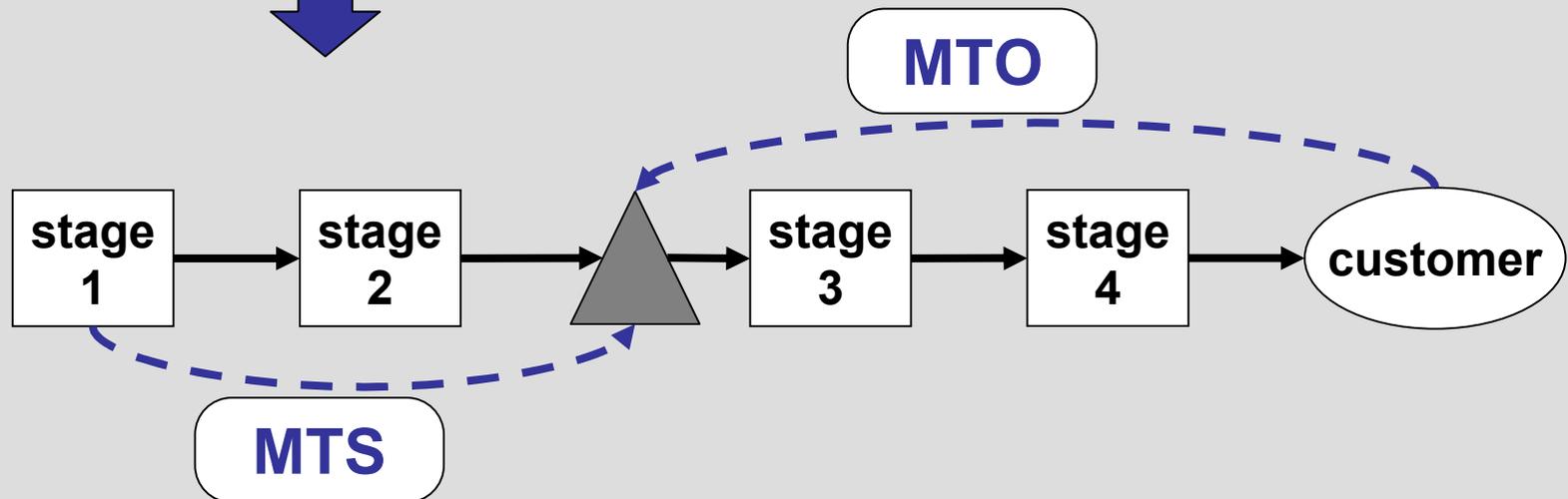
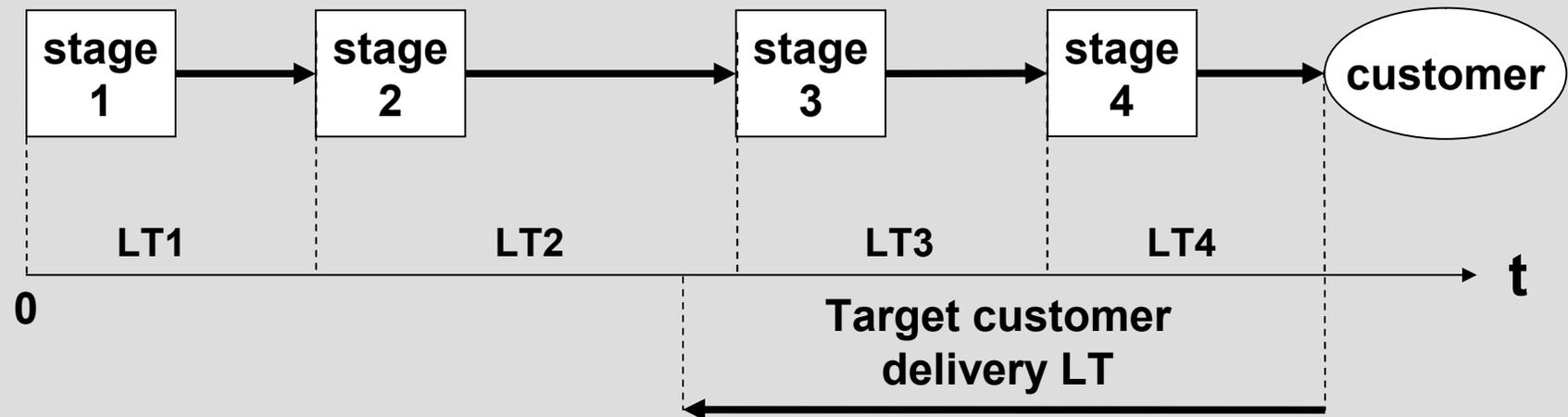
# What is Kanban?



# Multi-Stage Kanban & CONWIP

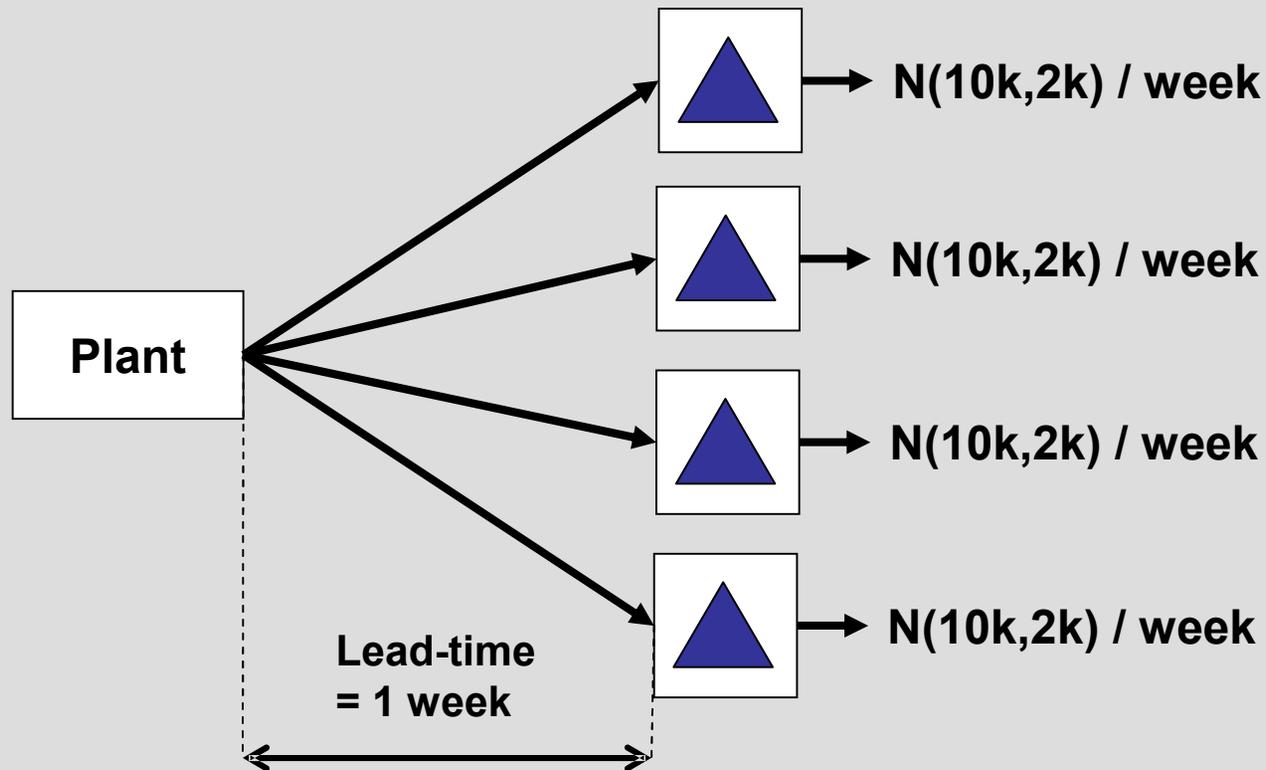


# Customer and Process Timeline



# Distribution System Example

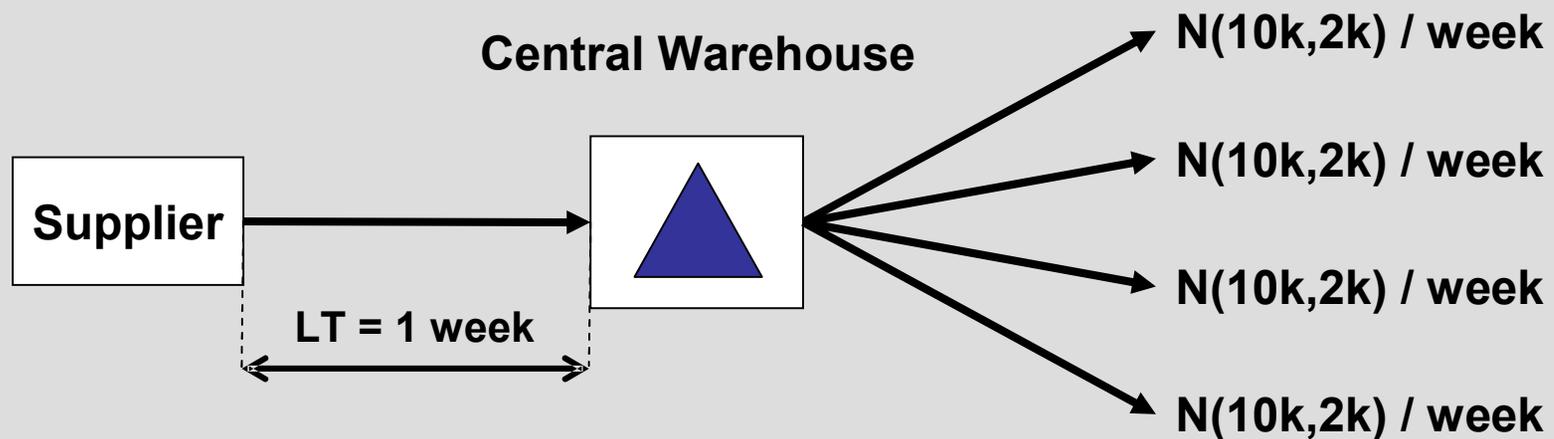
## Regional Warehouses



Assuming a (S,T) weekly review policy in each warehouse (95% service level, T=1), How much safety stock should there be in this distribution system?

**Work out your answer here**

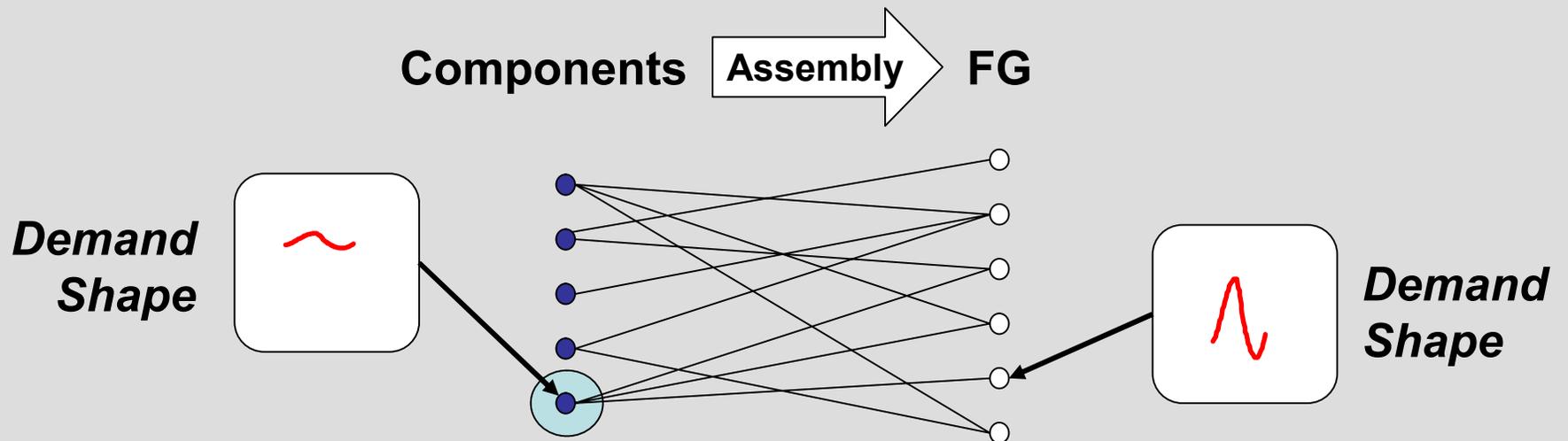
# Central Warehouse



With a (S,T) weekly review policy in the central warehouse (95% service level, T=1),  
How much safety stock should there be now?

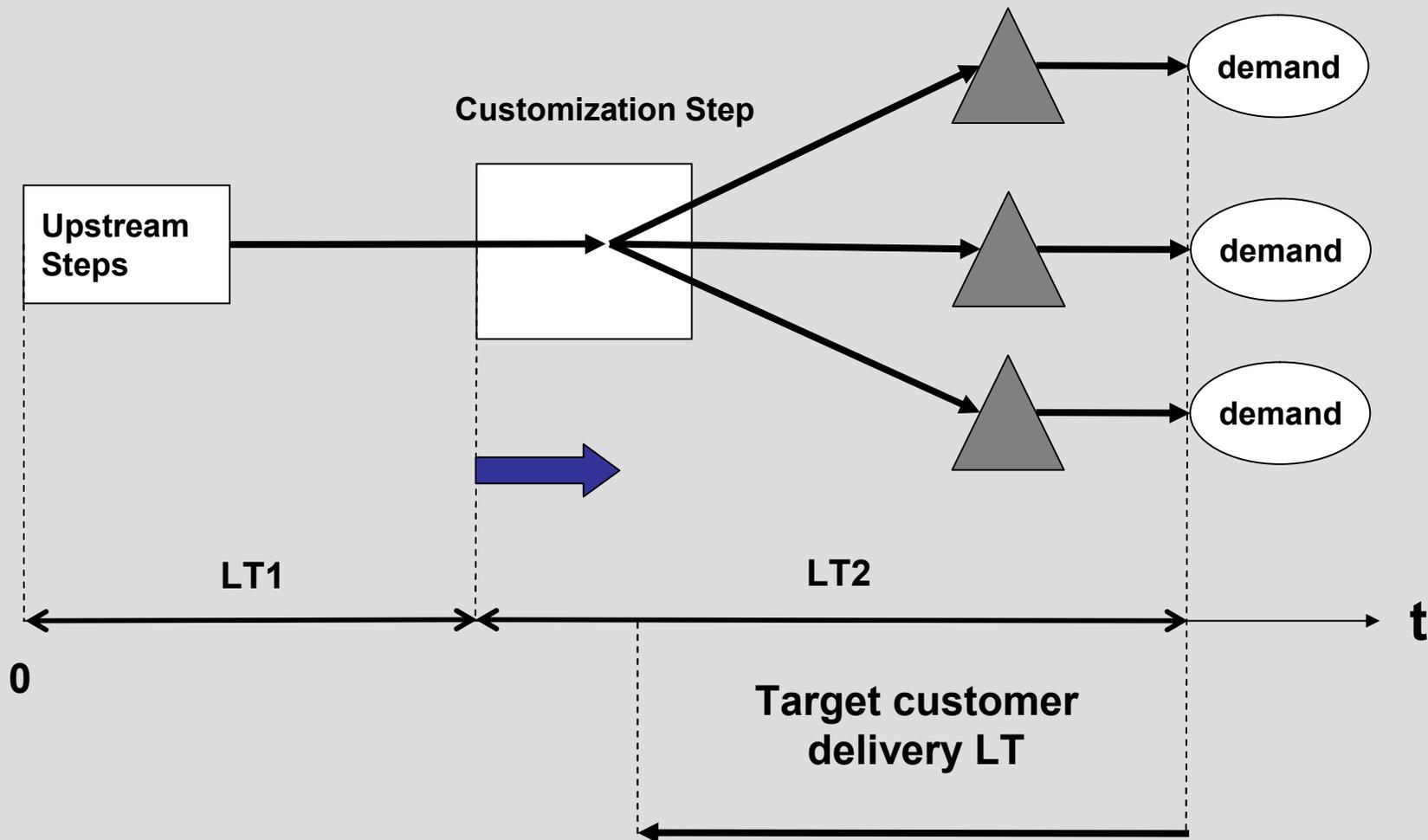
**Work out your answer here**

# Component Commonality

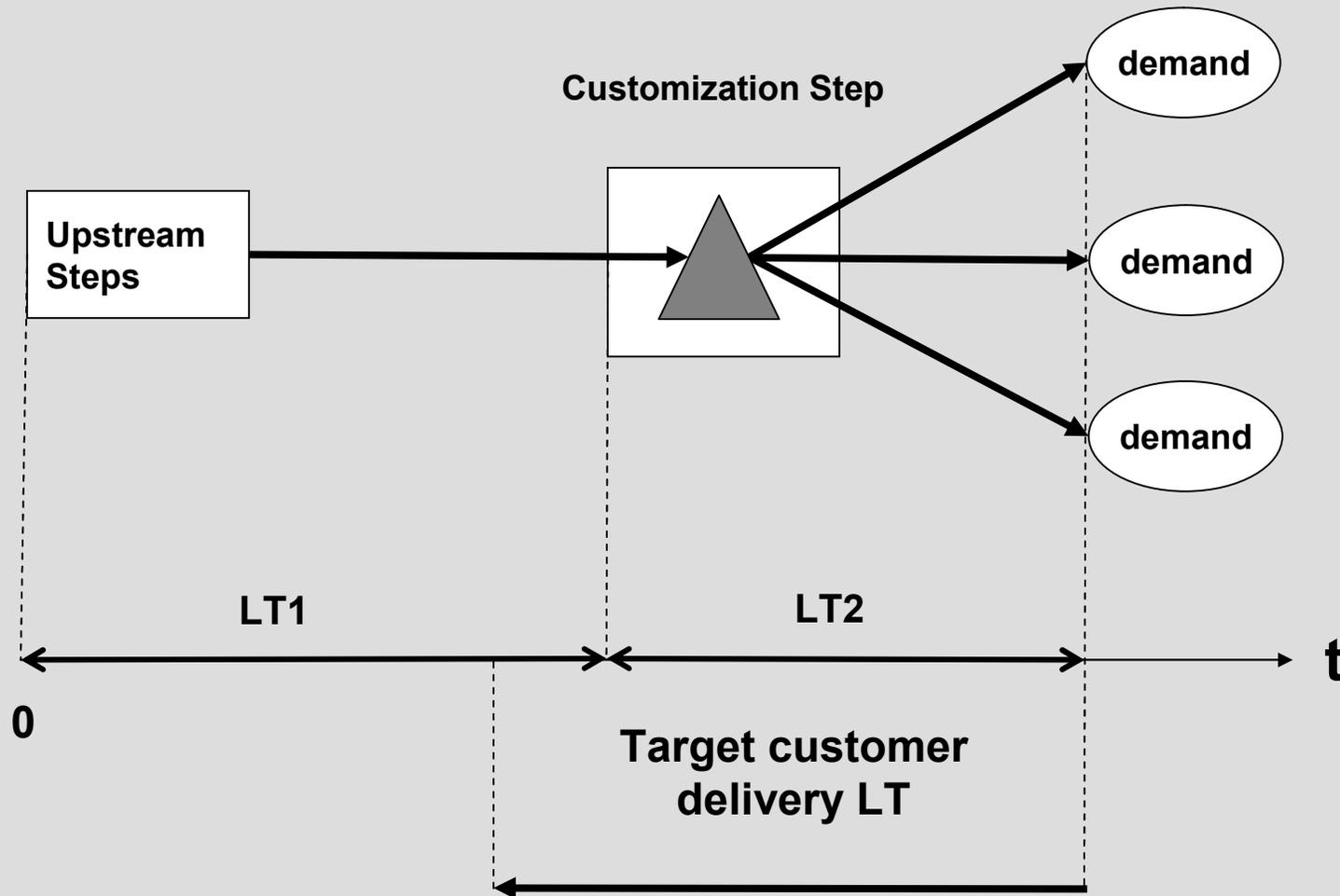


- **Instead of geographic differentiation, this is an assembly differentiation**

# Delayed Differentiation



# Delayed Differentiation



# **Production Control Wrap-Up**

- 1. Production Control, Push, Pull, MTS, MTO**
- 2. MRP, Kanban, CONWIP**
- 3. MTS/MTO and Lead-Time Target**
- 4. Pooling and Delayed Differentiation**