

IE375 Fall 2020
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Introduction

Introduction

- Production management: the process of managing people and resources to create a good or a service
- Three major functional areas of a firm
 - Marketing
 - Finance
 - Operations
- “Operations” is responsible for transforming raw materials into products (conducting activities for output).

Goods versus services

- Goods (Manufacturing operations management)
 - Tangible products (requiring a series of physical operations)
 - Examples: Furniture manufacturers, automobile, apparel
 - Can be sold from inventory, may be perishable
- Services (Service operations management)
 - Intangible products (requiring a series activities)
 - Airlines, hospitals, banks, insurance companies, repair shops
 - May not be inventoried, mostly perishable
- Major planning problems are common.

Operations strategy

- The strategic positioning along the dimensions of **cost, quality, delivery speed, delivery reliability** and **flexibility**.
 - Cost: Price sensitive customers are the target customers for the firm - Hyundai
 - Quality – Volvo
 - Delivery speed: ability to deliver more quickly McDonalds
 - Delivery reliability: ability to supply the product on the promised due date
 - Flexibility: ability to offer a wide variety of products, to react to changes in customer demand - Custom tailor
- **Trade-off:** Usually, not competitive in **ALL**
 - Cost versus quality
 - Delivery speed versus flexibility
- **Trade-off:** Some companies have differentiated products with different priorities
 - Volkswagen versus Audi, Renault Clio versus Megane
- We presume a given strategy.

Production Planning and Control

- **Production Plan:** A plan which describes the acquisition and allocation of limited resources to production activities such that the decided products or systems are produced to satisfy customer demand.
- **Production Planning:** A broad range of activities to come up with a production plan.
- **Production Control:** Tracking what is actually materialized in the production environment and modifying production decisions adaptively, if a back-up plan is available. (IE376)

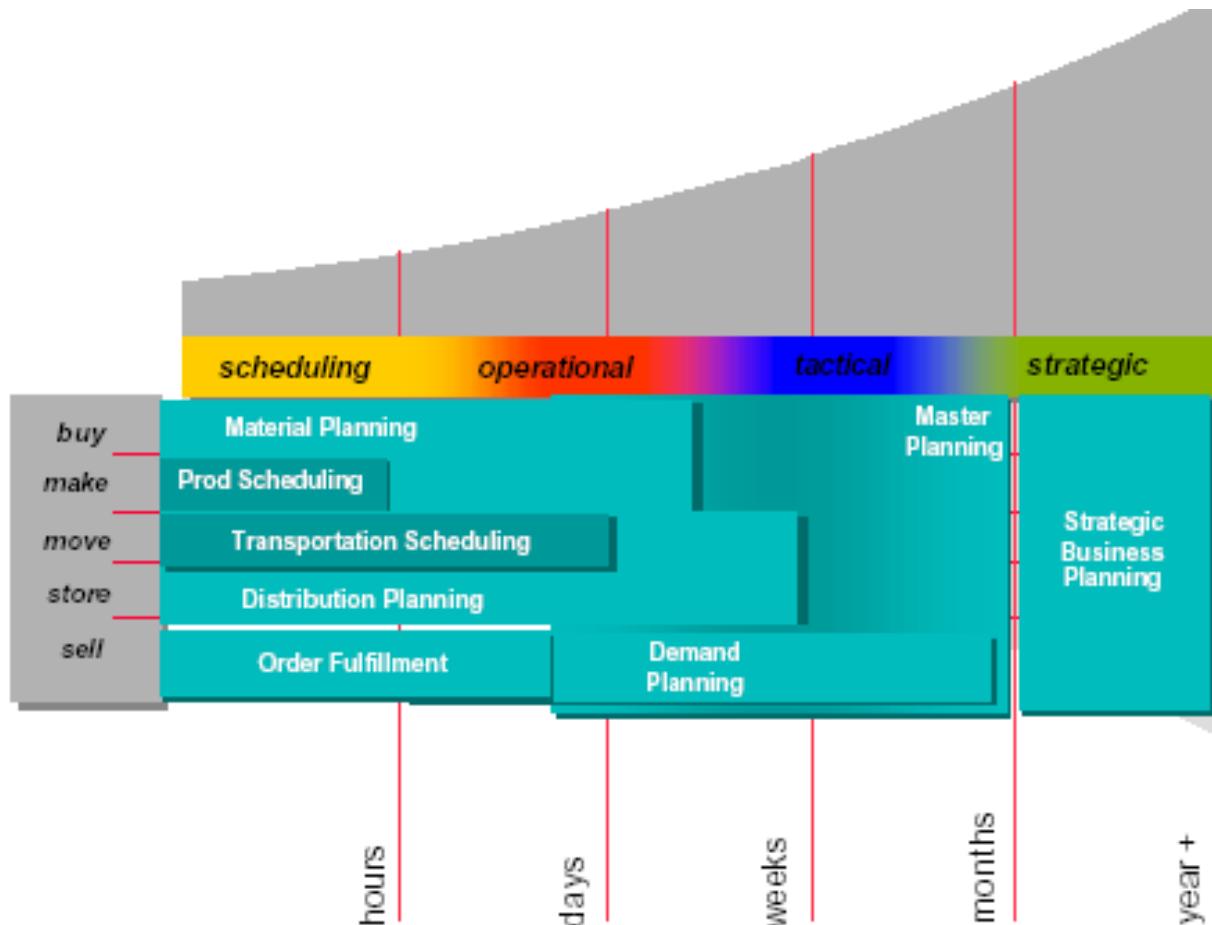
Production planning

- Strategic decisions - Design and enhancement of the production system
 - Planning horizon is 3-5 years (6-18 months)
 - » Facilities planning
 - » Capacity planning - How much capacity do I add? When?
 - » Decisions regarding customers (distribution, service)
 - » Selection of product groups
- Tactical decisions - Management of the production system
 - Planning horizon is 1-3 years (3-6 months)
 - » Sales planning: How much will I be able to sell? When?
 - » Production levels, how much to outsource
 - » Distribution planning - How to deliver goods and services?
 - » Workforce levels
 - » Inventory levels at different facilities

Production planning

- Operational decisions (daily, weekly, monthly)
 - How should I schedule detailed tasks in my facilities to meet my production targets?
 - » Manufacturing scheduling, lot sizing
 - » Assigning resources to jobs, daily overtime levels
 - » Purchasing decisions
 - » Examples: Scheduling, purchasing
- It is usually impossible to solve planning problems using a single (monolithic) model. So?
- Engineering: Divide and conquer - hierarchical manner - strategic (long term), tactical (mid term) and operational (short term)
 - Planning hierarchy and consistency

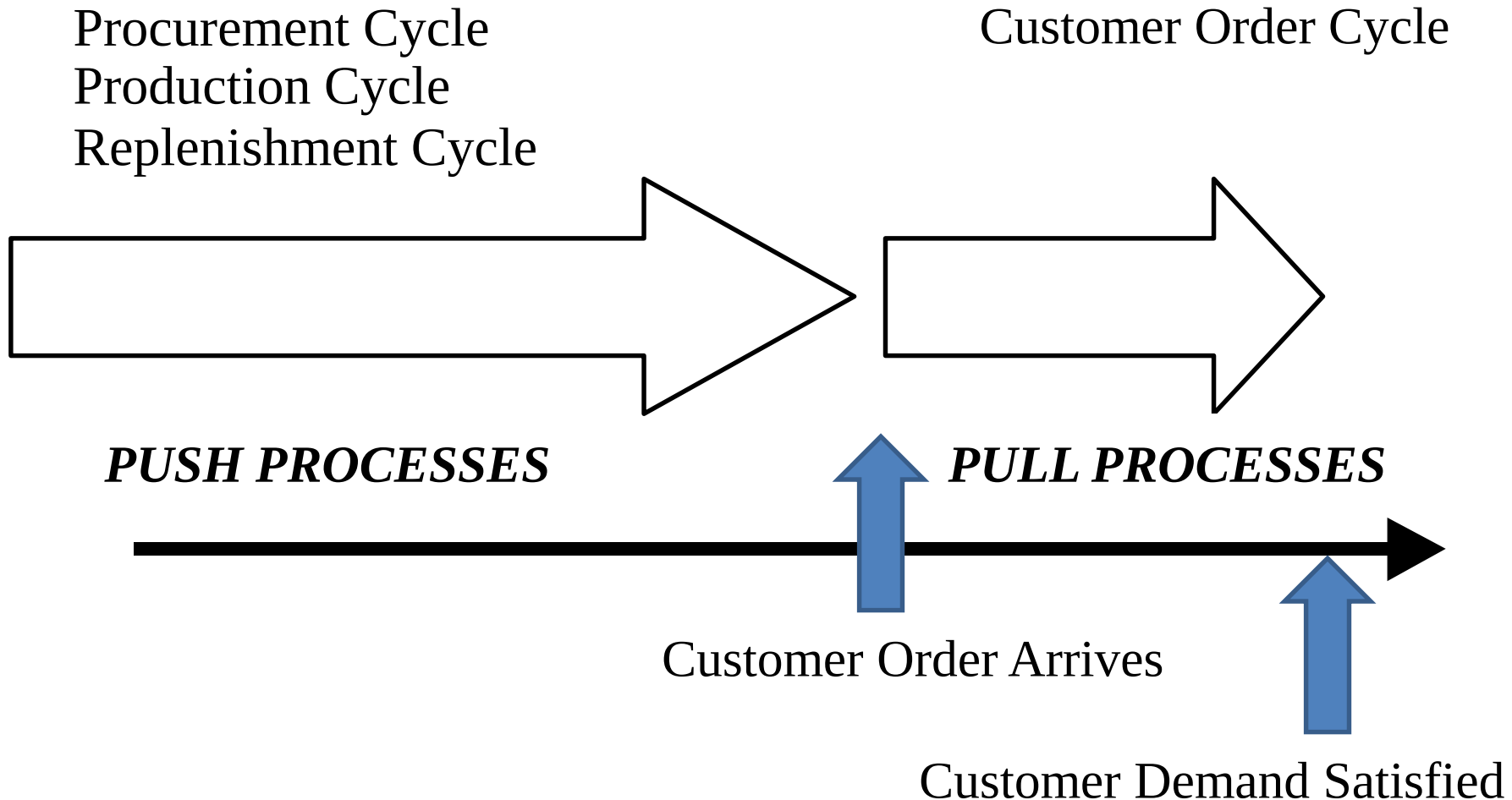
Hierarchy of planning problems



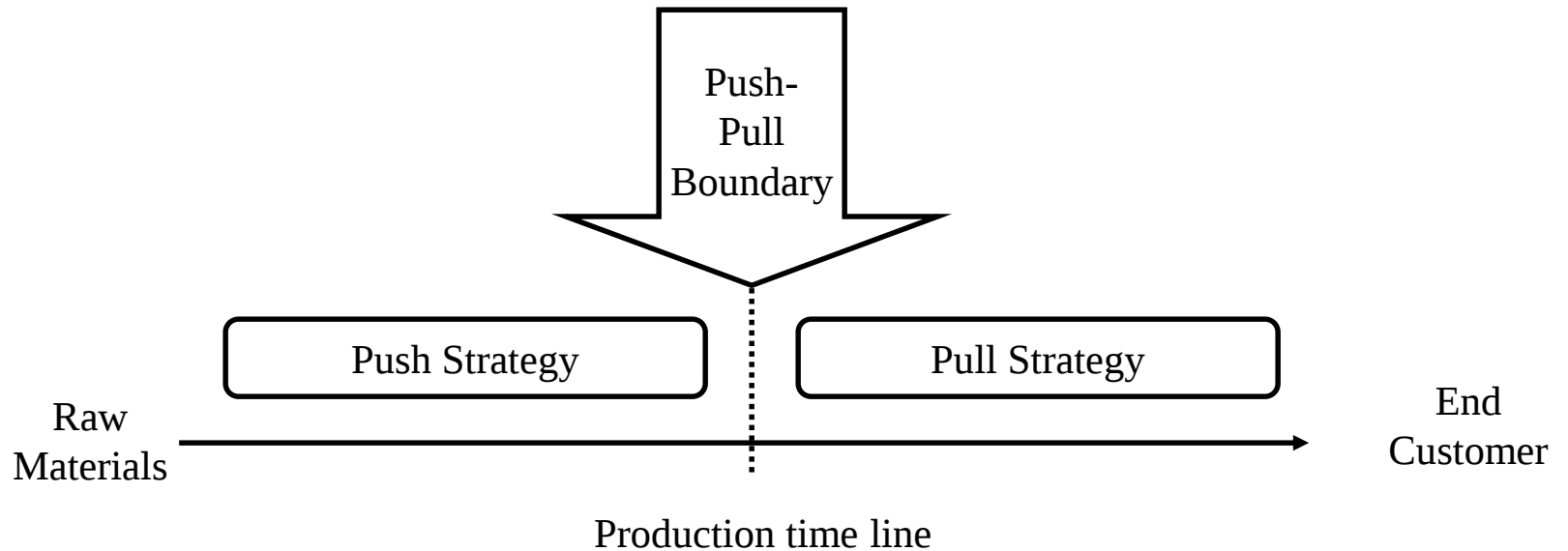
Push System versus Pull System

- What initiates the movement of work?
- In **Push** systems, work release is based on demand forecasts
 - Keeps inventory to meet actual demand
 - Acts **proactively**
- In **Pull** systems, work release is based on actual demand
 - May cause long delivery lead times
 - Acts **reactively**

Push/Pull View of Production Systems (Natural/Designed)



Push-Pull Systems (Plan)



Locating the Push-Pull Boundary

