Wrap-up

Lecture Notes

IE375 Spring 2024
Nesim K. Erkip

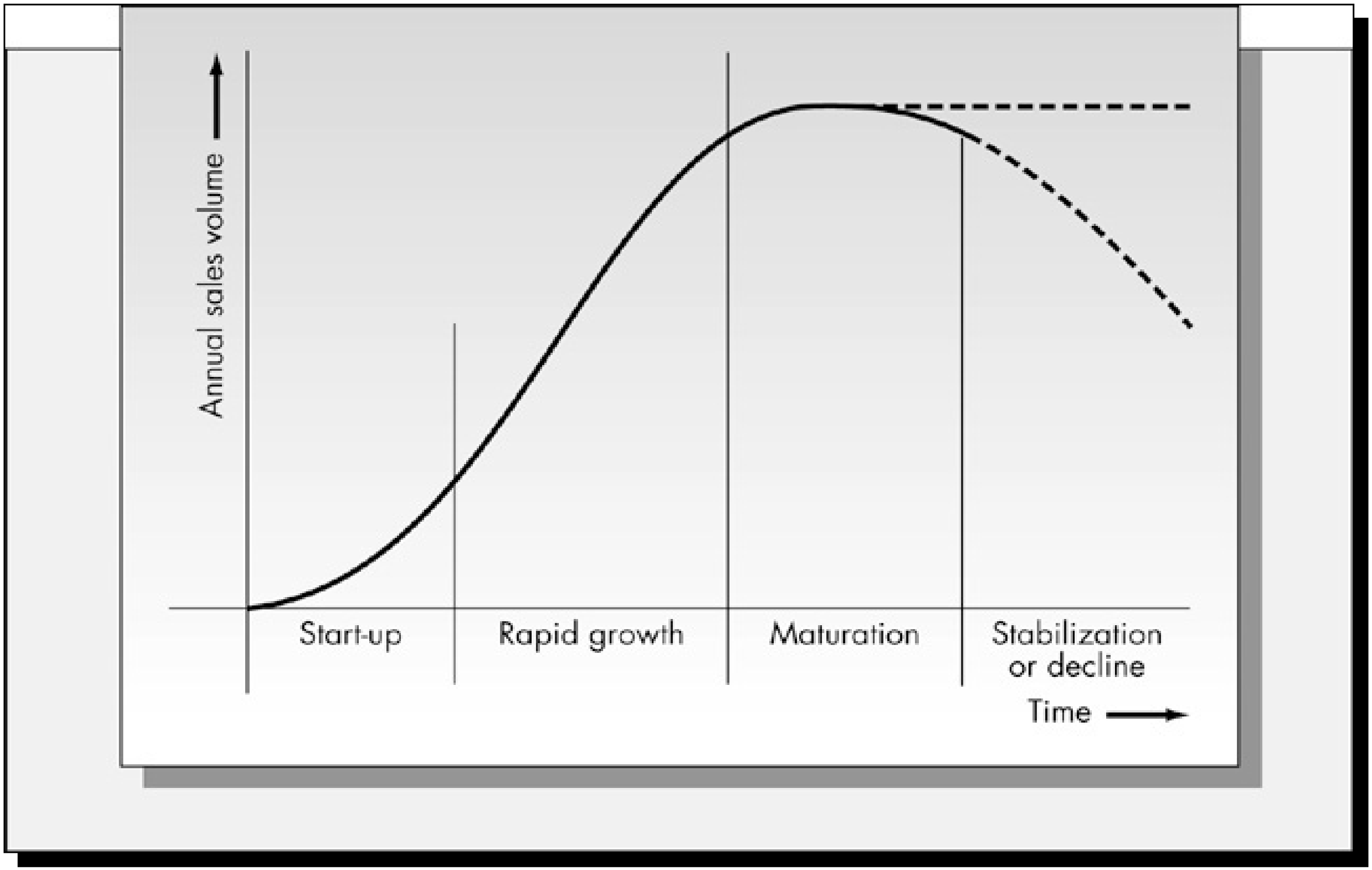
Recall

- 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)
  - ❑ Services (Service operations management)

➢ Operations strategy

The strategic positioning of the firm along the dimensions of cost, quality, delivery speed, delivery reliability and flexibility

Product life cycle



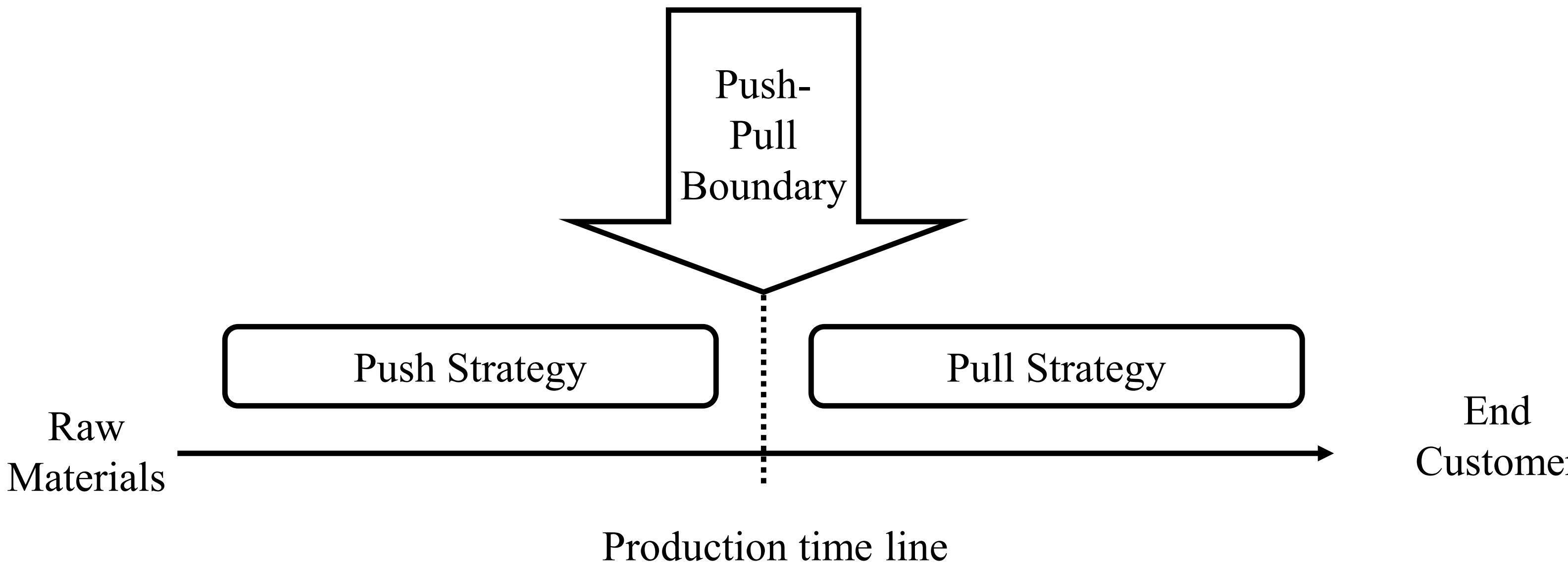
Production Planning and Control

- **Production Control**: Tracking what is actually materialized to update/modify production decisions + other input parameters, adaptively
- Planning + Control – Rolling Horizon – Repetitive activity
- Impossible to solve a single (monolithic) model – we approach in a hierarchical manner
  - Strategic decisions (Forecasting, resource planning, ...=
  - Tactical decisions (Forecasting, workforce planning, master production scheduling, Inventory planning, project scheduling)
  - Operational decisions (Forecasting, scheduling, purchasing, lot sizing , project scheduling)

Planning hierarchy and consistency

- How to ensure that the plans at different hierarchy levels are consistent with each other?
- How to ensure that the plans at different hierarchy levels are developed considering the same performance measures?

Push-Pull Systems



Production Related References:

- Your text book: a good starting point for all related topics – checking references of each chapter is a reasonable move to search.
- Forecasting:
  - Package forecast: https://cran.r-project.org/web/packages/forecast/index.html
  - Text Book: ***Introduction-to-Time-Series-Analysis-and-Forecasting*** by Montgomery et al (2008) – pdf available at the WEB

http://www.stat.ipb.ac.id/en/uploads/KS/S2%20-%20ADW/3%20Montgomery%20-%20Introduction%20to%20Time%20Series%20Analysis%20and%20Forecasting.pdf

Production Related References:

- Production Planning:
  - Many text-books at the library, some descriptive, some quantitative – Text Book: ***Factory Physics*** by Hopp and Spearman, 2011
- Inventory:
  - ***Inventory and Production Management in Supply Chains*** by Silver et al, 2017
- Scheduling:
  - ***Planning and Scheduling in Manufacturing and Services*** by Pinedo, 2009
- A large number of academic articles in several journals – all reachable thru the university library

Remaining Coursework

Required Courses (Directly IE375 related)

- IE376 – Production Information Systems
- IE Restricted Elective on Data Risk and Uncertainty
- Project Electives
  - IE477-IE478 or GE401-402

- IE324 – Simulation
- IE342 – Engineering Economic Analysis

Remaining Coursework

IE Restricted Electives –

You are to be informed by the Department Chair.

IE490 and IE491 Research