



SMART
INDUSTRY
LABORATORY

Scheduling Algorithms (2)

- Production Management -

Graduate School of **Information,**
Production and Systems

Shigeru FUJIMURA



An Overall Framework for Production Planning and Scheduling in Production Management Systems

Types of Production Processes

Assembly Line



Batch



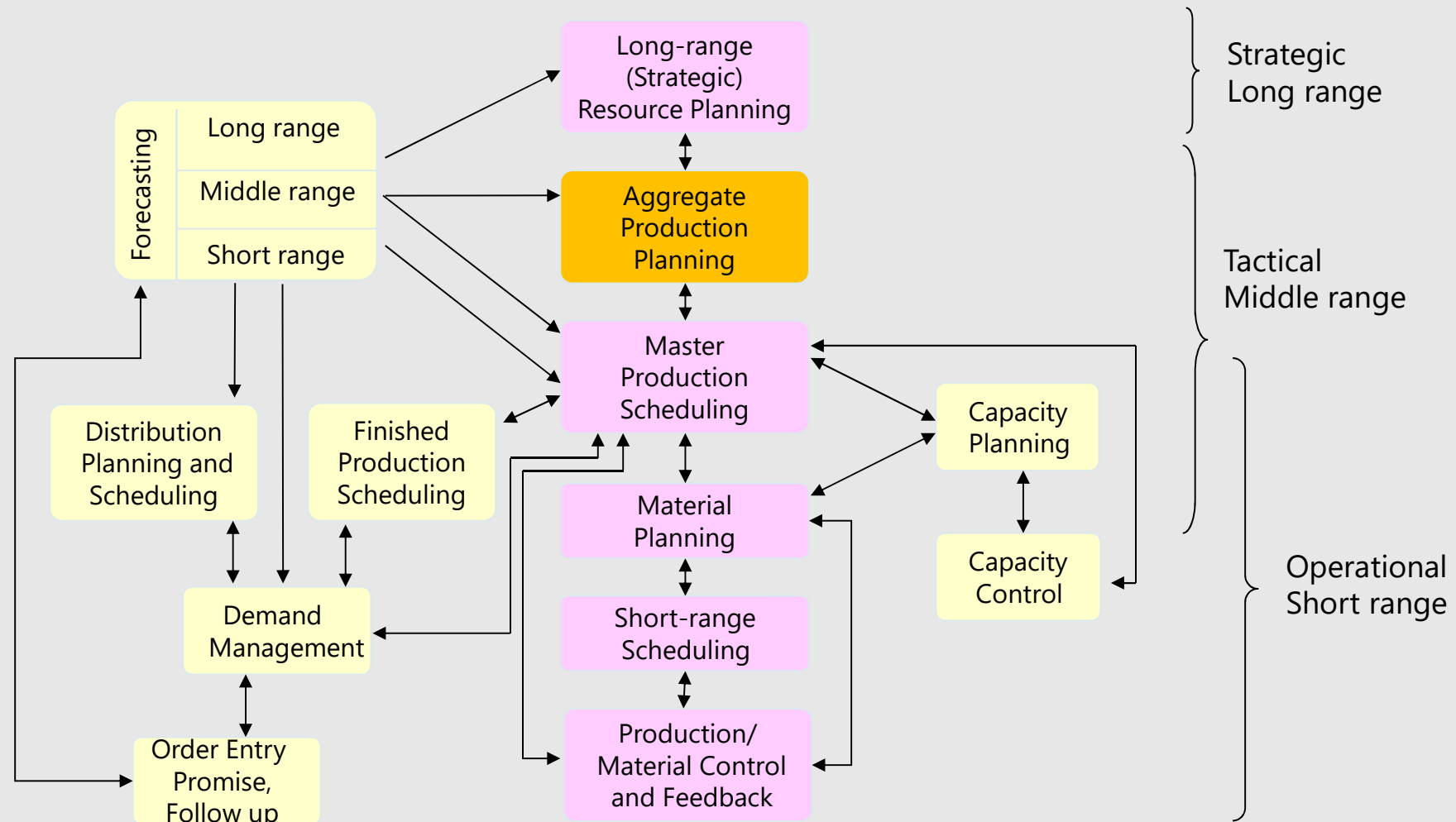
Continuous Flow



Decision Making Level

	Planning		Scheduling
Category of Activity	Strategic	Tactical	Operational
General Types of Decisions	Plans for acquisition of resources	Plans for utilization of resources	Detailed schedules for execution
Management Level	High	Middle	Low
Time Horizon	Long	Middle	Short
Level of Detail	Very Aggregated	Aggregated	Very Detailed
Uncertainty	High	Medium	Low
Matters under Control of Management	<ul style="list-style-type: none"> • Company Policy • Nature of Products • Workers Contracts • Energy Contracts ... 	<ul style="list-style-type: none"> • Operation Hours • Work force sizes • Subcontracting Levels • Output Rates • Transportation Rate ... 	<ul style="list-style-type: none"> • Procedure • Sequence • Quantity • Material Control ...

A Framework for Production Decision Making

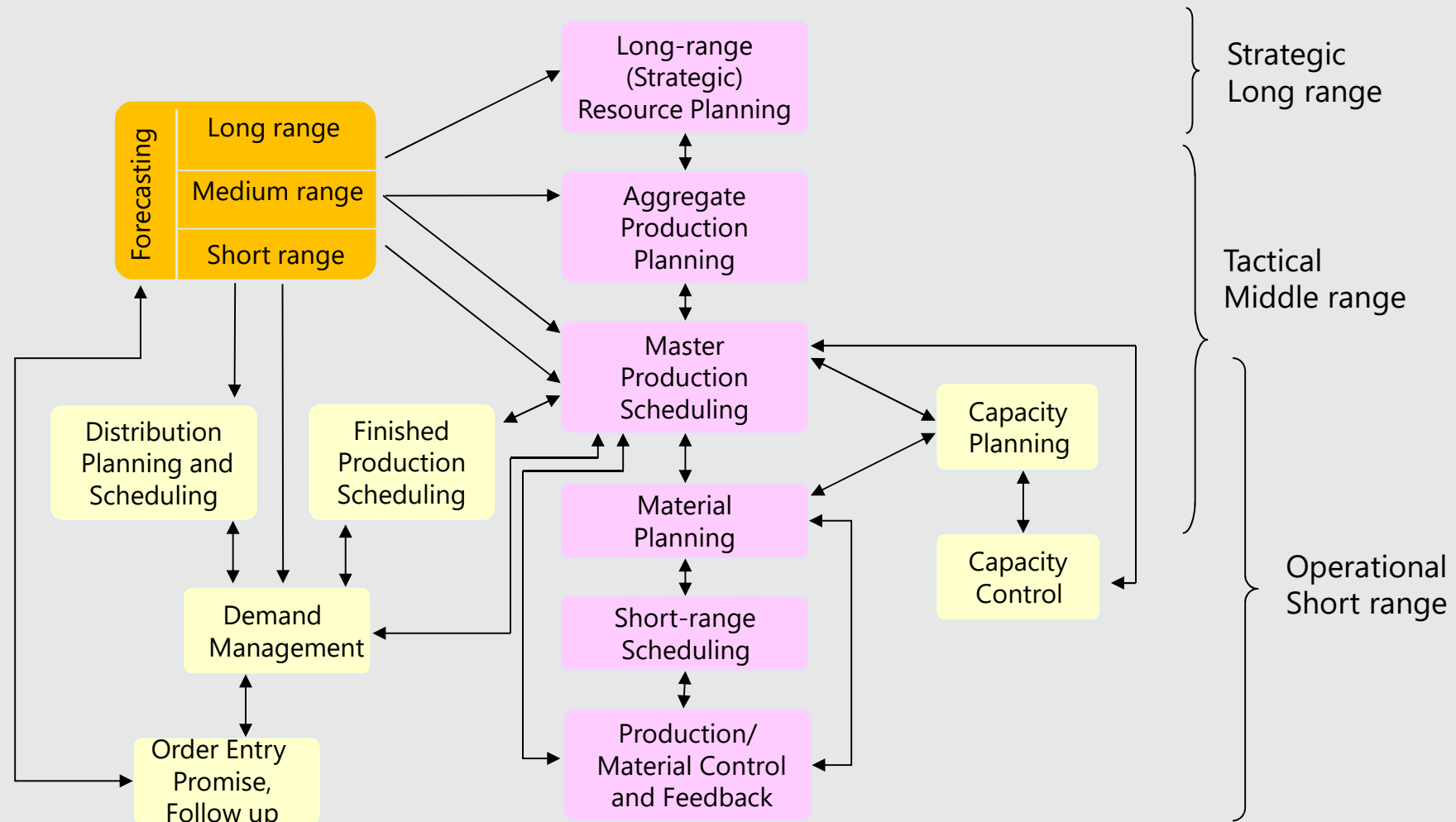


Aggregate Production Planning

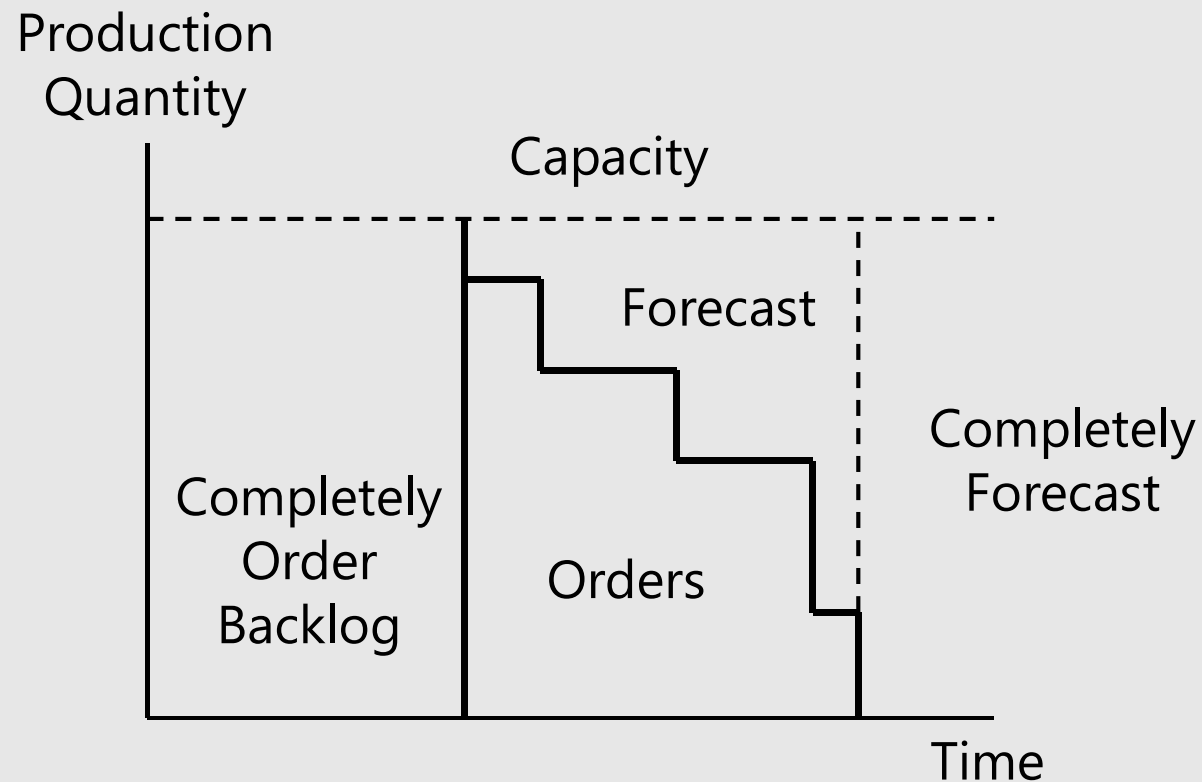
Establishing production rates, work force sizes, and inventory levels on the order of six to twenty-four months into the future.

- ☐ The time block is generally one month,
- ☐ The planning is done on an aggregate basis for families of items

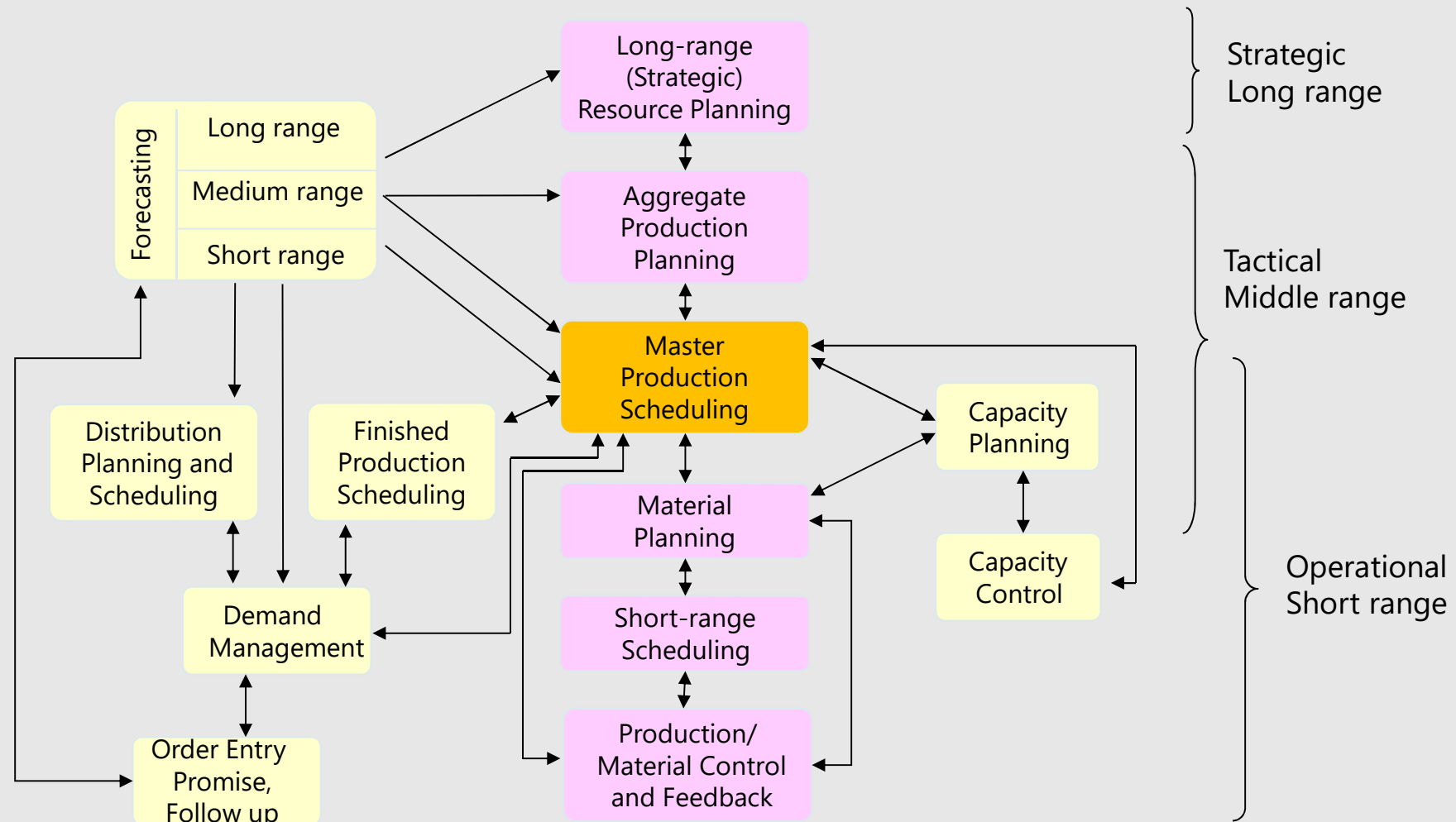
A Framework for Production Decision Making



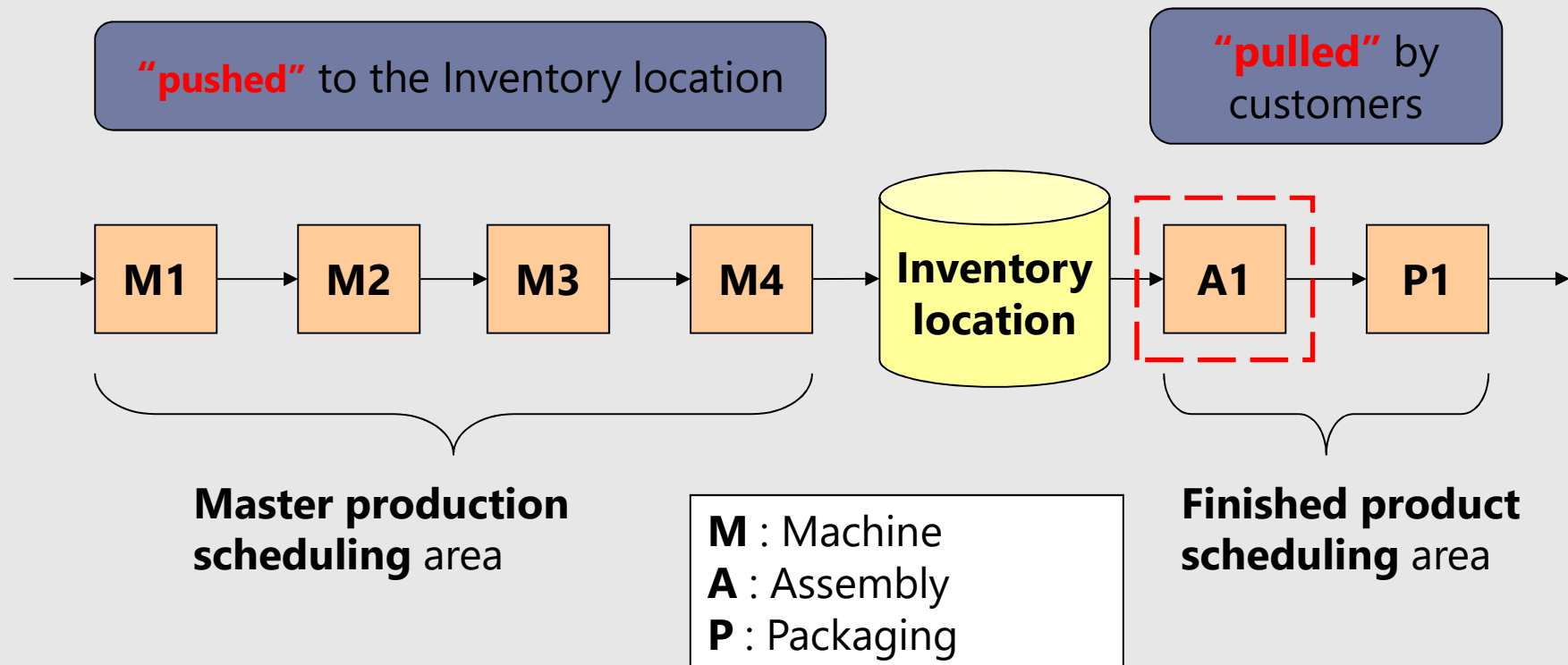
Relation between Order Backlog and Forecasts



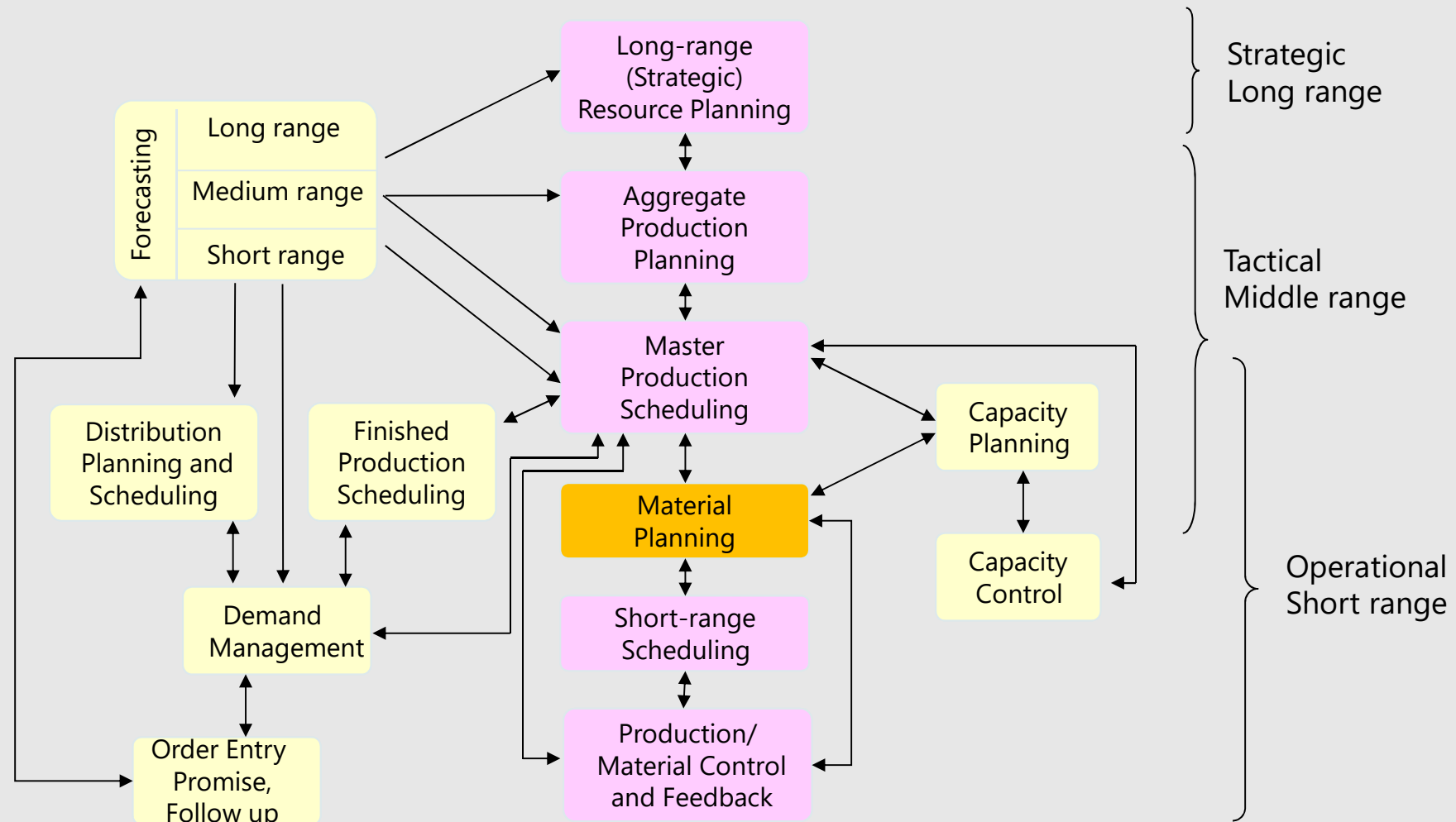
A Framework for Production Decision Making



Master Production Scheduling and Finished Product Scheduling



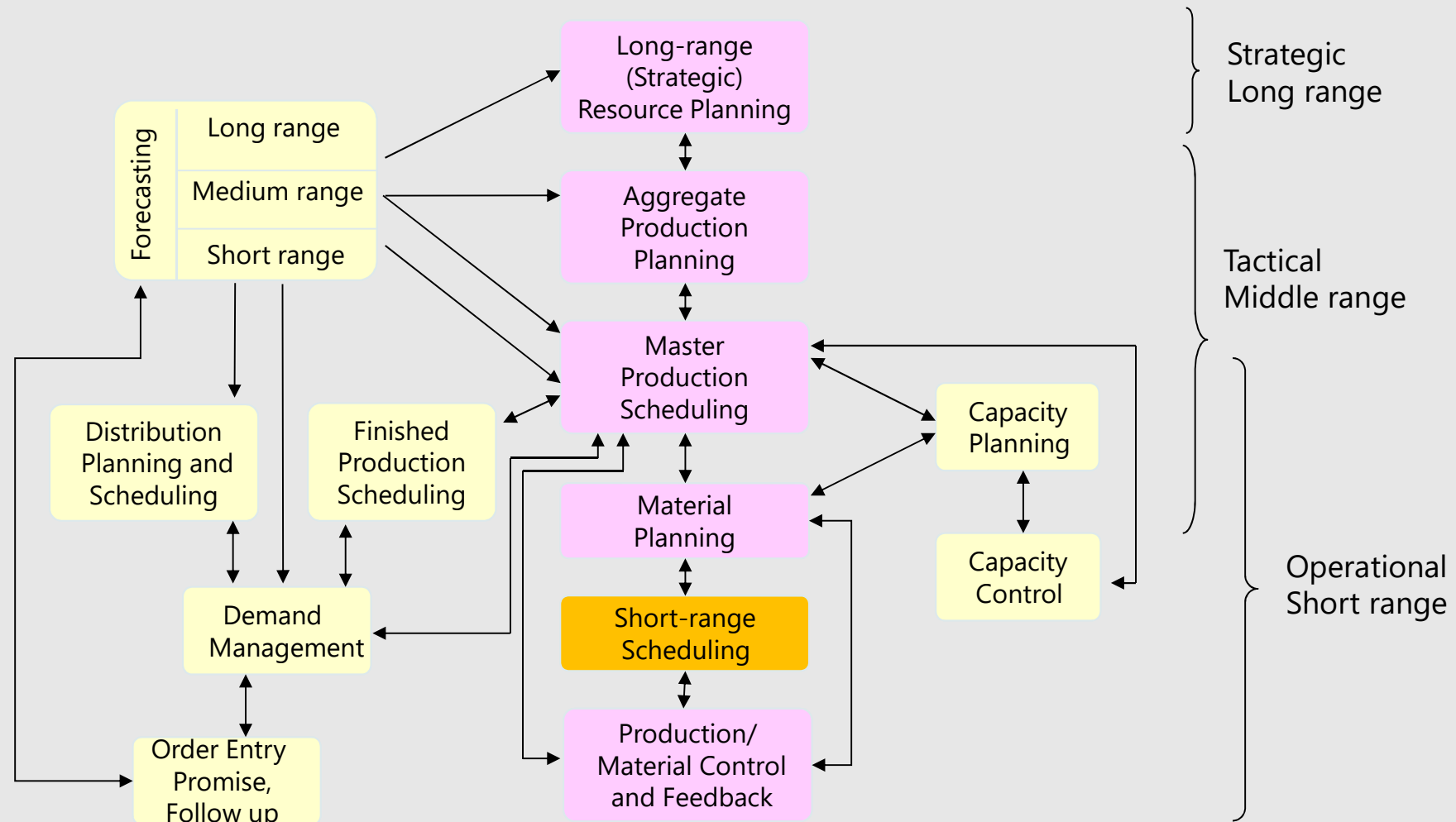
A Framework for Production Decision Making



Material Planning

- ❑ It explodes the master production schedule into detailed production/procurement schedules of all components & raw materials
- ❑ It is a complicated task in assembly contexts where there can be literally thousands of SKUs (Stock Keeping Units).

A Framework for Production Decision Making



Short-Range Scheduling

- Short-range scheduling...
 - is done **after** a feasible master production schedule is established.
 - is concerned with final scheduling of production usually narrowed down to a **finer** time grid.

Short-Range Scheduling

- Scheduled orders are released to production based on the master production schedule and the associated material plan.
- The Short-Range Scheduling can include the rescheduling of open (tentative) orders anytime.
- Dispatch lists created by Short-Range Scheduling **suggest** the sequence in which jobs are to be run on each machine.

Why using the word "**suggest**" ?

- because the shop foreman knows the hidden *agendas (that can never be factored into a priority setting model).

Summary

- What kinds of decision making behavior are done in manufacturing factories.
- Difference between Planning and Scheduling

SMART
INDUSTRY
LABORATORY



Thank
you