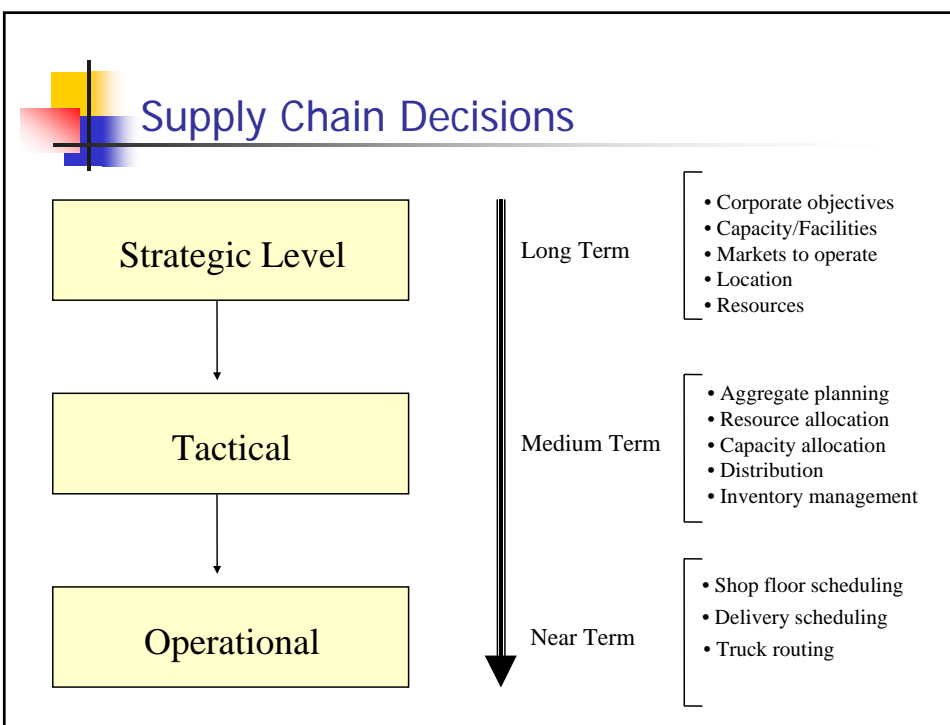


Aggregate Planning





AGGREGATE PLANNING

- Deciding on the level of capacity (e.g., physical capacity or labor) of a firm and on how to readjust that capacity to respond to changing demand conditions.
- A way of translating demand forecasts into a blueprint for staffing/capacity and production levels for the firm over a predetermined planning period.



Aggregation

Product families

- Have similar markets and manufacturing processes
- Share in common relevant units of measurement: units, barrels, tons, dollars, standard hours

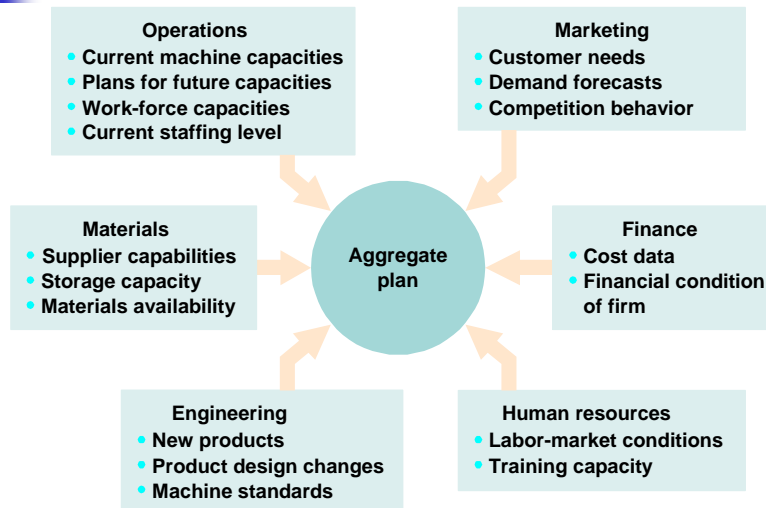
Labor

- Aggregation depends on flexibility of work force
- May be considered a single aggregate group if work force is flexible or entire work force produces every product family

Time

- Updated monthly or quarterly
- Planning periods are usually months or quarters, not days

Input for an aggregate plan



Typical Objectives

- Minimize costs, maximize profits
- Respond quickly to the changes in demand or market conditions
- Maximize customer service
- Minimize inventory investment
- Minimize changes in production rates
- Minimize changes in workforce levels
- Maximize utilization of plant/equipment



Reactive and Proactive Alternatives

Reactive Alternatives

- Work force adjustment
 - Overtime and undertime
 - Inventory
 - Subcontractors
 - Backlogs, backorders,
and stockouts
-

Proactive Alternatives

- Complementary products
- Creative pricing



Aggregate Planning for Service

Level strategy

Determine a stable workforce level that minimizes undertime by using the maximum amount of overtime in the peak period. If undertime is not paid for, which is often true with part-time workers, calculate the *equivalent staff size* for each period. It is the number of part-time workers, working the maximum allowable time, that would be needed to meet demand without any undertime. Use this size to calculate regular-time costs.

Chase strategy

Adjust workforce levels as needed to achieve requirements without using overtime, undertime, or subcontractors. The *equivalent staff* row is identical to the requirements row, and there is no overtime in any period.



Application – Distribution Center

Work-force requirements are shown as the number of part-time employees required for each accounting period. Each employee works a maximum of 20 hours per week on regular time, but can work less. Employees are paid only for time worked (no undertime is paid).

	Accounting Period													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Requirement	5	6	8	15	17	20	15	15	10	16	14	14	12	167

Ten part-time clerks are currently employed. Overtime cannot exceed 25 percent of the regular-time capacity in any period. That is, the maximum a part-time can work is 25 hours per week. Backorders are not permitted on a planned basis.



Level Strategy at Distribution Center

	Accounting Period													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Requirement*	5	6	8	15	17	20	15	15	10	16	14	14	12	167

Number of part-time employees at 25 hours maximum/week

$$1.25w = 20 \text{ employees (period 6)}$$

$$w = \frac{20}{1.25} = 16 \text{ employees}$$



Level Strategy at Distribution Center

	Accounting Period													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Requirement*	5	6	8	15	17	20	15	15	10	16	14	14	12	167
Staff level	16	16	16	16	16	16	16	16	16	16	16	16	16	208
Hires														
Layoffs														



Level Strategy at Distribution Center

	Accounting Period													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Requirement*	5	6	8	15	17	20	15	15	10	16	14	14	12	167
Staff level	16	16	16	16	16	16	16	16	16	16	16	16	16	208
Hires	6	—	—	—	—	—	—	—	—	—	—	—	—	6
Layoffs	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Overtime														

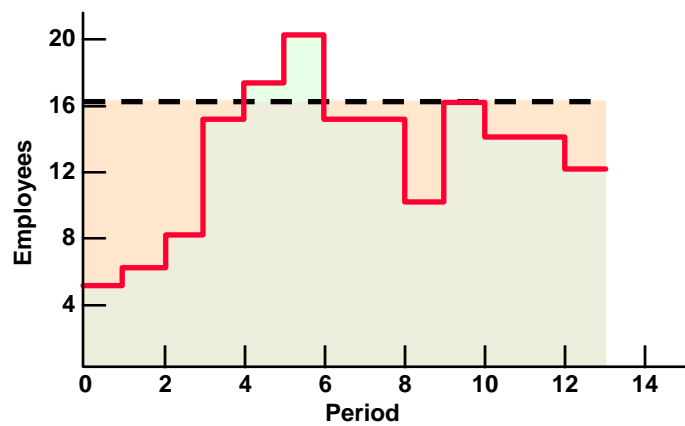


Level Strategy at Distribution Center

	Accounting Period													
	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Requirement*	5	6	8	15	17	20	15	15	10	16	14	14	12	167
Staff level	16	16	16	16	16	16	16	16	16	16	16	16	16	208
Hires	6	—	—	—	—	—	—	—	—	—	—	—	—	6
Layoffs	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Overtime	—	—	—	—	1	4	—	—	—	—	—	—	—	5



Level Strategy at Distribution Center



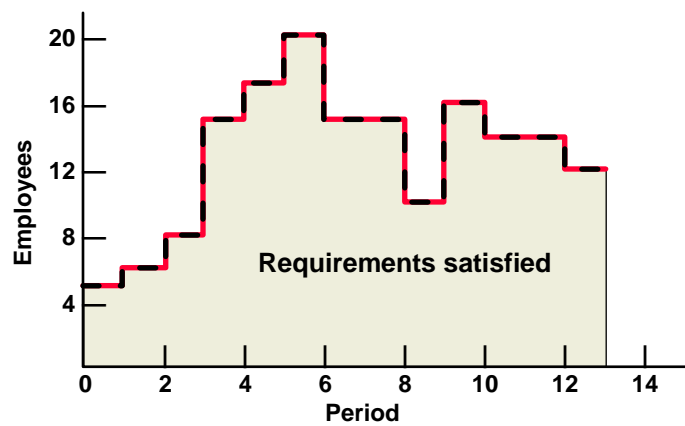


Chase Strategy at Distribution Center

	Accounting Period													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Requirement*	5	6	8	15	17	20	15	15	10	16	14	14	12	167
Staff level	5	6	8	15	17	20	15	15	10	16	14	14	12	167
Hires	—	1	2	7	2	3	—	—	—	6	—	—	—	21
Layoffs	5	—	—	—	—	—	5	—	5	—	2	—	2	19
Overtime	—	—	—	—	—	—	—	—	—	—	—	—	—	0



Chase Strategy at Distribution Center





Total Cost of Plan

Regular-time wage rate	\$500 per accounting period at 20 hours per week
Overtime wages	150 percent of the regular-time rate
Hires	\$600 per person
Layoffs	\$100 per person



Total Cost of Plan

Cost - Level Strategy

Regular time	162 worker periods @ \$500 =	\$81,000
Overtime	5 worker periods @ \$750 =	3,750
Hire	6 workers @ \$600 =	3,600
Layoff	0 workers @ \$100 =	0
		Total \$88,350

Cost - Chase Strategy

Regular time	167 worker periods @ \$500 =	\$83,500
Overtime	0 worker periods @ \$750 =	0
Hire	21 workers @ \$600 =	12,600
Layoff	19 workers @ \$100 =	1,900
		Total \$98,000