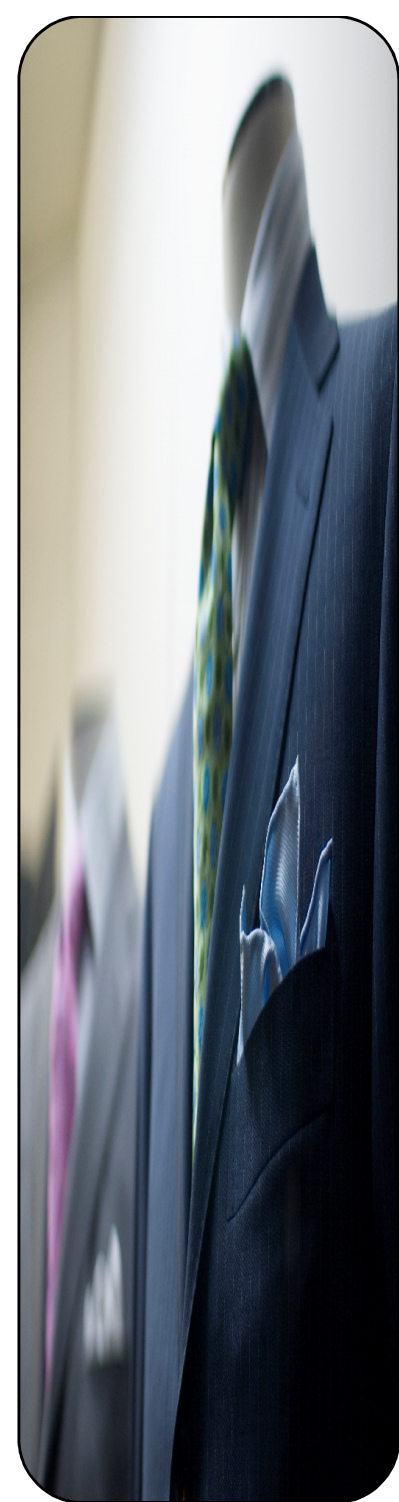


CHAPTER 9



**Balancing *Demand*
Against
Productive Capacity**



Overview of Chapter 9



- **Fluctuations in Demand Threaten Service Productivity**
- **Managing Capacity**
- **Analyze Patterns of Demand**
- **Managing Demand**
- **Inventory Demand through Waiting Lines and Reservations**
- **Perceptions of Waiting Time**
- **Inventory Demand Through a Reservations System**



***Fluctuations in Demand
Threaten Service
Productivity***

What is Productive Capacity?



- **Productive capacity can take several forms in services**
 - **Physical facilities designed to contain customers**
 - **Physical facilities designed for storing or processing goods**
 - **Physical equipment used to process people, possessions, or information**
 - **Labor**
 - **Infrastructure**
- **Financial success in businesses that are limited in capacity depends largely on how capacity is used**

From Excess Demand to Excess Capacity



Four conditions potentially faced by fixed-capacity services:

- **Excess demand**

- Too much demand relative to capacity at a given time

- **Demand exceeds optimum capacity**

- Upper limit to a firm's ability to meet demand at a given time

- **Optimum capacity**

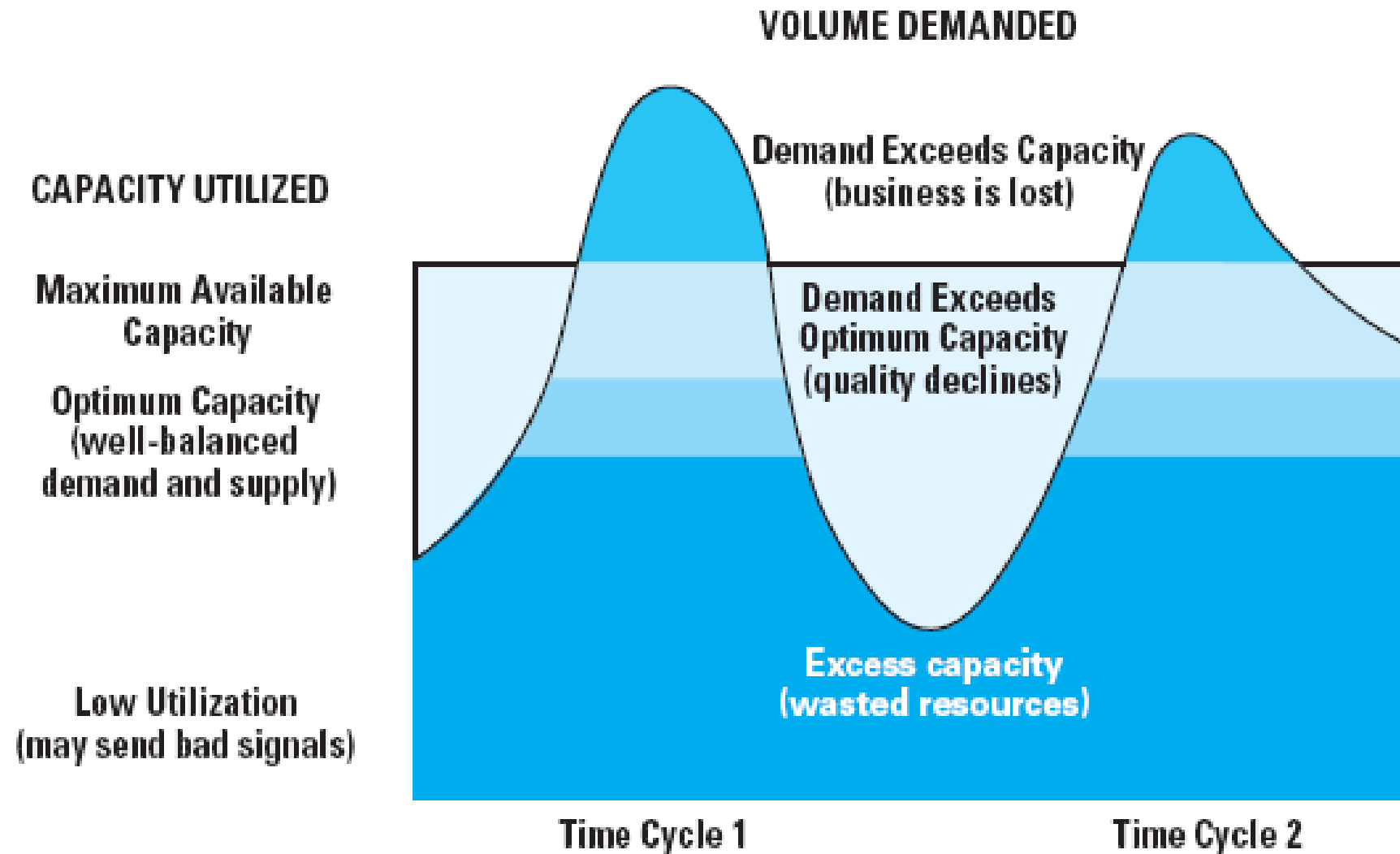
- Point beyond which service quality declines as more customers are serviced

- **Excess capacity**

- Too much capacity relative to demand at a given time

Variations in Demand Relative to Capacity

(Fig. 9.7)

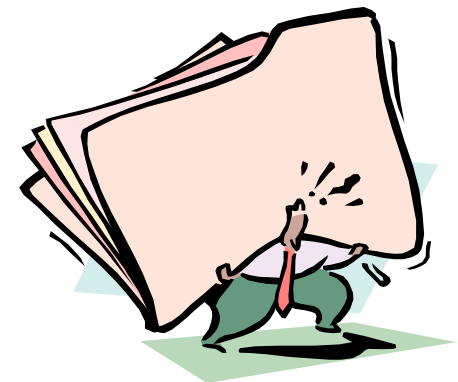


Addressing Problem of Fluctuating Demand



Two basic approaches:

- **Adjust level of capacity to meet demand**
 - **Need to understand productive capacity and how it varies on an incremental basis**
- **Manage level of demand**
 - **Use marketing strategies to smooth out peaks, fill in valleys**
- **Many firms use a mix of both approaches**





Managing Capacity

Alternative Capacity Management Strategies



- **Capacity is fixed, but more people are served at the same level of capacity**
- **Stretch and shrink:**
 - Offer inferior extra capacity at peaks (e.g. bus/train standees)
 - Use facilities for longer/shorter periods
 - Reduce amount of time spent in process by minimizing slack time
- **Chase demand (adjust capacity to match demand)**

Adjusting Capacity to Match Demand



- **Schedule downtime during periods of low demand**
- **Cross-train employees**
- **Use part-time employees**
- **Invite customers to perform self-service**
- **Ask customers to share**
- **Create flexible capacity**
- **Rent or share extra facilities and equipment**



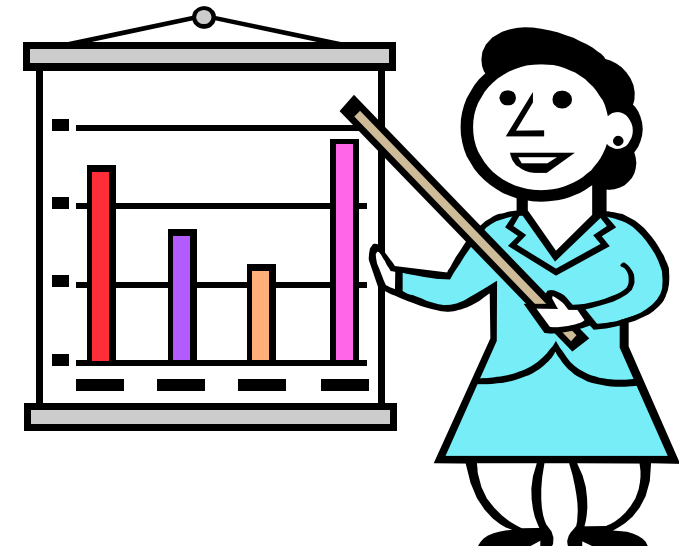


Analyze Patterns of Demand

Demand Varies by Market Segment



- Demand may seem random, but analysis may reveal a predictable demand cycle for different segments
- Keep good records of transactions to analyze demand patterns
 - Sophisticated software can help to track customer consumption patterns
- Record weather conditions and other special factors that might influence demand



Predictable Demand Patterns and Their Underlying Causes (Table 9.1) (1)

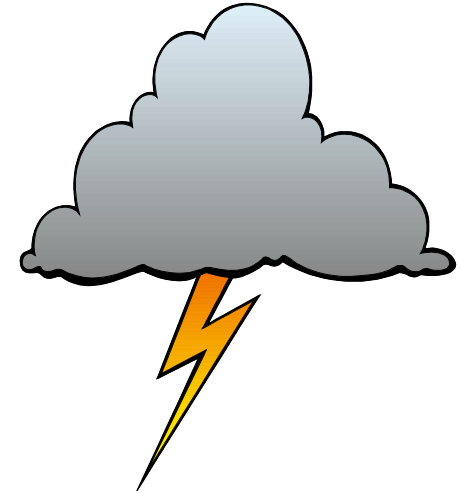


Predictable Cycles of Demand Levels	Underlying Causes of Cyclical Variations
<ul style="list-style-type: none">→ day→ week→ month→ year→ other	<ul style="list-style-type: none">→ employment→ billing or tax payments/refunds→ pay days→ school hours/holidays→ seasonal climate changes→ public/religious holidays→ natural cycles

Predictable Demand Patterns and Their Underlying Causes (Table 9.1) (2)



- **Underlying causes of randomly changing demand levels**
 - **Weather**
 - **Health problems**
 - **Accidents, Fires, Crime**
 - **Natural disasters**
- **Disaggregate demand by market segment for a particular service over time**
 - **Use patterns by particular type of customer or for a particular purpose**
 - **Variations in net profitability for each completed transaction**





Managing Demand

Alternative Demand Management Strategies

(Table 9.2)



- **Take no action**

- **Let customers sort it out**

- **Reduce demand**

- **Higher prices**

- **Communication encouraging use of other time slots**

- **Increase demand**

- **Lower prices**

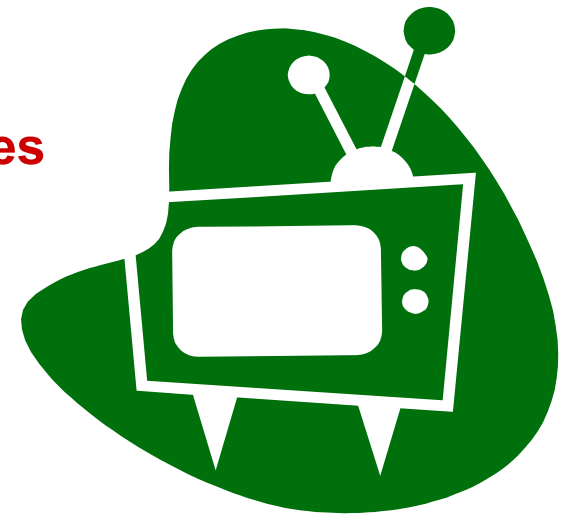
- **Communication, including promotional incentives**

- **Vary product features to increase desirability**

- **More convenient delivery times and places**

- **Inventory demand by reservation system**

- **Inventory demand by formalized queuing**



Marketing Strategies Can Reshape Some Demand Patterns



- Use price and other costs to manage demand
- Change product elements
- Modify place and time of delivery
 - No change
 - Vary times when service is available
 - Offer service to customers at a new location
- Promotion and Education





Inventory Demand Through Waiting Lines and Reservations

When Demand Exceeds Supply



Steps to take to inventory demand (keep for use later)

- **Asking customers to wait in line (queue), usually on a first-come first-served basis**
- **Offering customers the opportunity to reserve or book capacity in advance**

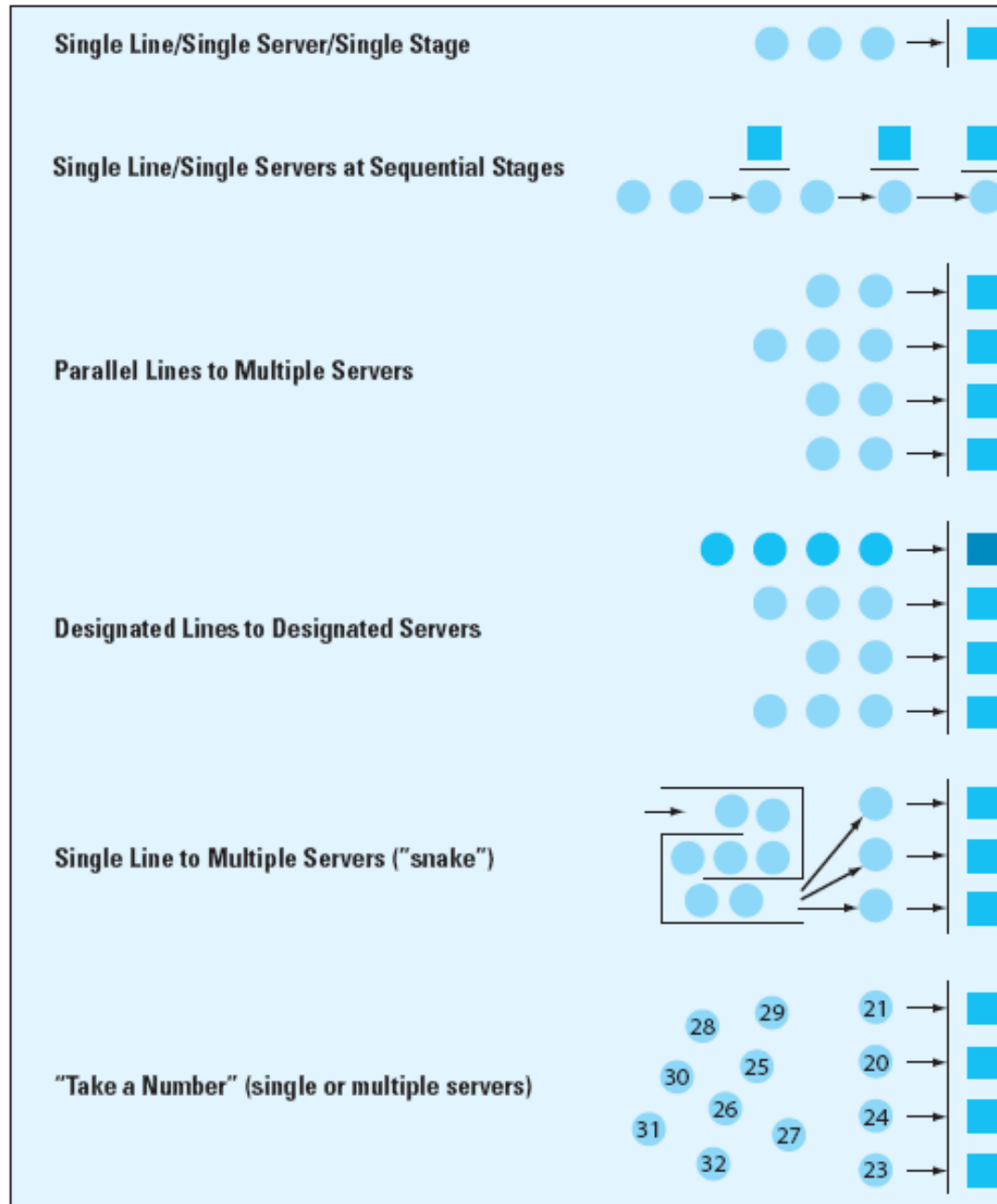
Waiting In Line



- **Almost nobody likes to wait**
- **An average person may spend up to 30 minutes/day waiting in line—equivalent to 20 months in an 80 year lifetime**
- **Not all queues take physical waiting in a single location**
 - **Queues may be physical but geographically dispersed**
 - **Some are virtual**

Alternative Queuing Configurations

(Fig. 9.15)



Virtual Waits



- **One problem of waiting is the waste of customers' time**
- **Virtual queues can eliminate the need to wait**
- **Customers register their place in line on a computer, which estimates the time they need to reach the front of the virtual line, customers then return later to claim their place**
- **See Service Insights 9.2**



Perceptions of Waiting Time

Ten Propositions to Make Waiting More Bearable (1)



- 1. Unoccupied time feels longer than occupied time**
- 2. Solo waits feel longer than group waits**
- 3. Physically uncomfortable waits feel longer than comfortable ones**
- 4. Pre- and post-process waits feel longer than in-process waits**
- 5. Unexplained waits are longer than explained waits**

Sources: Maister; Davis & Heineke; Jones & Peppiatt

Cont.

Ten Propositions to Make Waiting More Bearable (2)



- 6. Unfamiliar waits seem longer than familiar ones**
- 7. Uncertain waits are longer than known, finite waits**
- 8. Unfair waits are longer than fair waits**
- 9. Anxiety makes waits seem longer**
- 10. People will wait longer for more valuable services**

Sources: Maister; Davis & Heineke; Jones & Peppiatt



Inventory Demand Through a Reservations System

Benefits of Reservations



- **Controls and smoothes demand**
- **Data captured helps organizations**
 - **Prepare financial projections**
 - **Plan operations and staffing levels**
- **Benefits businesses. Allows management to make sure some time is kept free for emergency jobs**
- **Pre-sells service**
- **Informs and educates customers in advance of arrival**
- **Saves customers from having to wait in line for service (if reservation times are honored)**

Characteristics of Well-Designed Reservations System



- **Fast and user-friendly for customers and staff**
- **Answers customer questions**
- **Offers options for self service (e.g. Web)**
- **Accommodates preferences (e.g., room with view)**
- **Deflects demand from unavailable first choices to alternative times and locations**

Reservations Strategies Should Focus on Yield



- **Yield analysis helps managers recognize opportunity cost of allocating capacity to one customer/segment when another segment might yield a higher rate later**
- **Decisions need to be based on good information**
 - Detailed record of past usage
 - Supported by current market intelligence and good marketing sense
 - Realistic estimate of changes of obtaining higher rated business
- **When firms overbook to increase yield,**
 - Victims of over-booking should be compensated to preserve the relationship

Summary of Chapter 9 – Balancing Demand and Productive Capacity (1)



- **At any moment in time, a fixed-capacity service may face**
 - **Excess demand**
 - **Demand exceeding optimum capacity**
 - **Demand and supply well-balanced at the level of optimum capacity**
 - **Excess capacity**
- **Productive resources are used for creating goods and services; when facing capacity constraints, firms can consider**
 - **Stretching or shrinking capacity levels**
 - **Adjusting capacity to match demand**
- **To determine what factors govern demand, firms need to**
 - **Divide demand by market segments**
 - **Understand patterns of demand**

Summary of Chapter 9 – Balancing Demand and Productive Capacity (2)



- **Five basic ways to manage demand**
 - Take no action
 - Reduce demand in peak periods
 - Increase demand in low periods
 - Inventory demand using a queuing system
 - Inventory demand using a reservations system
- **Demand levels can be reshaped by marketing strategies**
 - Use price and other costs to manage demand
 - Change product elements
 - Modify place and time of delivery
 - Use promotion and education

Summary of Chapter 9 – Balancing Demand and Productive Capacity (3)



- **Waiting is a universal phenomenon. Waits can be reduced by**
 - Rethinking the design of the queuing system
 - Redesigning the processes to shorten the time of each transaction
 - Managing customers' behavior and their perceptions of the wait
 - Installing a reservation system
- **An effective reservations system**
 - Enables demand to be controlled and smoothed in manageable way
 - Should focus on yield
 - Requires information