ISM 270

Service Engineering and Management
Lecture 3: Technology in Services
Announcements

- Homework 1 due April 28, 2009
- Term Project Proposal Due April 28, 2009
- 3 Case Studies Write-ups Due June 6, 2009
Today’s Lecture

- Role of Technology in Services, especially in new service development
Discussion

Name an Internet site you believe will be successful in the long run - explain why.
Technology in Service
What roles can technology play?
Role of Technology in the Service Encounter

A. Technology-Free Service Encounter
B. Technology-Assisted Service Encounter
C. Technology-Facilitated Service Encounter
D. Technology-Mediated Service Encounter
E. Technology-Generated Service Encounter
## Technology has led to the Evolution of Self-service

<table>
<thead>
<tr>
<th>Service Industry</th>
<th>Human Contact</th>
<th>Machine Assisted Service</th>
<th>Electronic Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking</td>
<td>Teller</td>
<td>ATM</td>
<td>Online banking</td>
</tr>
<tr>
<td>Grocery</td>
<td>Checkout clerk</td>
<td>Self-checkout station</td>
<td>Online order/ pickup</td>
</tr>
<tr>
<td>Airlines</td>
<td>Ticket agent</td>
<td>Check-in kiosk</td>
<td>Print boarding pass</td>
</tr>
<tr>
<td>Restaurants</td>
<td>Wait person</td>
<td>Vending machine</td>
<td>Online order/ delivery</td>
</tr>
<tr>
<td>Movie theater</td>
<td>Ticket sale</td>
<td>Kiosk ticketing</td>
<td>Pay-for-view</td>
</tr>
<tr>
<td>Book store</td>
<td>Information clerk</td>
<td>Stock-availability terminal</td>
<td>Online shopping</td>
</tr>
<tr>
<td>Education</td>
<td>Teacher</td>
<td>Computer tutorial</td>
<td>Distance learning</td>
</tr>
<tr>
<td>Gambling</td>
<td>Poker dealer</td>
<td>Computer poker</td>
<td>Online poker</td>
</tr>
</tbody>
</table>
Self-service Technologies (SST)

- Does customer adoption of self-service follow a predictable pattern?
- How do we measure self-service quality (e.g., ease of use, enjoyment, and/or control)?
- What is the optimal mix of SST and personal service for a service delivery system?
- How do we achieve continuous improvement when using SST?
- What are the limits of self-service given the loss of human interaction?
Self-Service examples

- Airline industry
Technology has led to service automation

- Fixed-sequence (F) - parking lot gate
- Variable-sequence (V) - ATM
- Playback (P) - answering machine
- Numerical controlled (N) - animation
- Intelligent (I) - autopilot
- Expert system (E) - medical diagnosis
- Totally automated system (T) - EFT
Technology has led to a variety of services available via the web

- A retail channel (Amazon.com)
- Supplemental channel (Barnes & Nobel)
- Technical support (Dell Computer)
- Embellish existing service (HBS Press)
- Order processing (Delta Airline)
- Convey information (Kelly Blue Book)
- Organization membership (POMS.org)
- Games (Treeloot.com)
Several technologies needed to converge to bring E-Business

- Internet
- Global telephone system
- Communications standard TCP/IP (Transfer Control Protocol/Internet Protocol)
- Addressing system of URLs
- Personal computers and cable TV
- Customer databases
- Sound and graphics
- User-friendly free browser
E-Business Led to Multiple Business Models

- Content Provider: Reuters
- Direct to Customer: Dell
- Full-Service Provider: GE Supply Co.
- Intermediary: eBay
- Shared Infrastructure: SABRE
- Value Net Integrator: 7-Eleven Japan
- Virtual Community: Monster.com
- Whole-of-Enterprise: Government
Economics of E-Business

- Sources of Revenue:
  - Transaction fees
  - Information and advice
  - Fees for services and commissions
  - Advertising and listing fees

- Ownership
  - Customer relationship
  - Customer data
  - Customer transaction
## Electronic vs. Traditional Services

<table>
<thead>
<tr>
<th>Features</th>
<th>Electronic</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encounter</td>
<td>Screen-to-face</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Availability</td>
<td>Anytime</td>
<td>Working hours</td>
</tr>
<tr>
<td>Access</td>
<td>From anywhere</td>
<td>Travel to location</td>
</tr>
<tr>
<td>Market Area</td>
<td>Worldwide</td>
<td>Local</td>
</tr>
<tr>
<td>Ambiance</td>
<td>Electronic interface</td>
<td>Physical environment</td>
</tr>
<tr>
<td>Payment</td>
<td>Credit card</td>
<td>Cash or check</td>
</tr>
<tr>
<td>Differentiation</td>
<td>Convenience</td>
<td>Personalization</td>
</tr>
<tr>
<td>Privacy</td>
<td>Anonymity</td>
<td>Social interaction</td>
</tr>
</tbody>
</table>
## Grocery Shopping Comparison

<table>
<thead>
<tr>
<th></th>
<th>On-line Shopping</th>
<th>Traditional Shopping</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>Convenience Saves time Less impulse buying</td>
<td>See new items Memory trigger Product sampling Social interaction</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Forget items Less control Need computer Delivery fee</td>
<td>Time consuming Waiting lines Carry groceries Impulse buying</td>
</tr>
</tbody>
</table>
## Economics of Scalability

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>High</th>
<th>Scalability</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-commerce continuum</td>
<td>Selling information (E-service)</td>
<td>Selling value-added service</td>
<td>Selling services with goods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Selling goods (E-commerce)</td>
<td></td>
</tr>
<tr>
<td>Information vs. Goods Content</td>
<td>Information dominates</td>
<td>Information with some service</td>
<td>Goods with support services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Goods dominate</td>
</tr>
<tr>
<td>Degree of Customer Content</td>
<td>Self-service</td>
<td>Call center backup</td>
<td>Call center support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Call center order processing</td>
</tr>
<tr>
<td>Standardization vs.</td>
<td>Mass distribution</td>
<td>Some personalization</td>
<td>Limited customization</td>
</tr>
<tr>
<td>Customization</td>
<td></td>
<td></td>
<td>Fill individual orders</td>
</tr>
<tr>
<td>Shipping and Handling</td>
<td>Digital asset</td>
<td>Mailing</td>
<td>Shipping</td>
</tr>
<tr>
<td>Costs</td>
<td></td>
<td></td>
<td>Shipping, order fulfillment, and warehousing</td>
</tr>
<tr>
<td>After-sales service</td>
<td>None</td>
<td>Answer questions</td>
<td>Remote maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Returns possible</td>
</tr>
<tr>
<td>Example Service</td>
<td>Used car prices</td>
<td>Online travel agent</td>
<td>Computer support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Online retailer</td>
</tr>
<tr>
<td>Example Firm</td>
<td>Kbb.com</td>
<td>Biztravel.com</td>
<td>Everdream.com</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amazon.com</td>
</tr>
</tbody>
</table>

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E-Business Supply Chain (Network) Elements

- Major entities including firm of interest and its customers, suppliers, and allies
- Major flows of product, information, and money
- Revenues and other benefits each participant receives
- Critical aspects: participants, relationships, and flows

Example: 7-Eleven Japan
Japanese 7-Eleven

- Read case in text
  - (p103, 6th edition)
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1. Merchandise selection and order
2. Transfer of information for payment
3. Issue of payment request
4. Print out of payment request
5. Payment
6. Notice of payment
7. Notice of payment
8. Delivery (Optional)
9. Transfer of payment
10. Transfer of payment

Customer
Internet Shop
7 eleven store
7 eleven center
Evolution of B2C E-Commerce in Japan

1. What features of the 7-Eleven Japan distribution system illustrate the “Value Net Integrator” e-business model?
2. Does the 7-Eleven Japan distribution system exhibit scalability economics?
3. How does the 7-Eleven example of B2C e-commerce in Japan illustrate the impact of culture on service system design?
4. Will the 7-Eleven “Konbini and Mobile” system be adopted in the United States?
New Service Development
Levels of Service Innovation

**Radical Innovations**

- **Major Innovation**: new service driven by information and computer based technology
- **Start-up Business**: new service for existing market
- **New Services for the Market Presently Served**: new services to customers of an organization

**Incremental Innovations**

- **Service Line Extensions**: augmentation of existing service line (e.g. new menu items)
- **Service Improvements**: changes in features of currently offered service
- **Style Changes**: modest visible changes in appearances
Technology Driven Service Innovation

- **Power/energy** - International flights with jet aircraft
- **Physical design** - Enclosed sports stadiums
- **Materials** - Astroturf
- **Methods** - JIT and TQM
- **Information** - E-commerce using the Internet
Service Design Elements

- Structural
  - Delivery system
  - Facility design
  - Location
  - Capacity planning

- Managerial
  - Service encounter
  - Quality
  - Managing capacity and demand
  - Information
New Service Development Cycle

**Full Launch**
- Full-scale launch
- Post-launch review

**Design**
- Service design and testing
- Process and system design and testing
- Marketing program design and testing
- Personnel training
- Service testing and pilot run
- Test marketing

**Analysis**
- Business analysis
- Project authorization

**Enablers**
- People
- Teams

**Organizational Context**

**Product**

**Technology**

**Systems**

**Tools**

**Development**
- Formulation of new services objective / strategy
- Idea generation and screening
- Concept development and testing

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Service Blueprint of Luxury Hotel
Strategic Positioning Through Process Structure

**Degree of Complexity**: Measured by the number of steps in the service blueprint. For example, a clinic is less complex than a general hospital.

**Degree of Divergence**: Amount of discretion permitted the server to customize the service. For example, the activities of an attorney contrasted with those of a paralegal.
## Structural Alternatives for a Restaurant

<table>
<thead>
<tr>
<th>LOWER COMPLEXITY/DIVERGENCE</th>
<th>CURRENT PROCESS</th>
<th>HIGHER COMPLEXITY/DIVERGENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Reservations</td>
<td>TAKE RESERVATION</td>
<td>Specific Table Selection</td>
</tr>
<tr>
<td>Self-seating. Menu on Blackboard</td>
<td>SEAT GUESTS, GIVE MENUS</td>
<td>Recite Menu: Describe Entrees &amp; Specials</td>
</tr>
<tr>
<td>Eliminate</td>
<td>SERVE WATER AND BREAD</td>
<td>Assortment of Hot Breads and Hors D’oeuvres</td>
</tr>
<tr>
<td>Customer Fills Out Form</td>
<td>TAKE ORDERS</td>
<td>At table. TakenPersonally by Maltre d’</td>
</tr>
<tr>
<td>Pre-prepared: No Choice</td>
<td>PREPARE ORDERS</td>
<td>Individually Prepared at table</td>
</tr>
<tr>
<td>Limit to Four Choices</td>
<td>Salad (4 choices)</td>
<td>Expand to 20 Choices: Add Flaming Dishes; Bone Fish at Table; Prepare Sauces at Table</td>
</tr>
<tr>
<td>Sundae Bar: Self-service</td>
<td>Entree (15 choices)</td>
<td>Expand to 12 Choices</td>
</tr>
<tr>
<td>Coffee, Tea, Milk only</td>
<td>Dessert (6 choices)</td>
<td>Add Exotic Coffees; Sherbet between Courses; Hand Grind Pepper</td>
</tr>
<tr>
<td>Bill and Beverage Together</td>
<td>SERVE ORDERS</td>
<td></td>
</tr>
<tr>
<td>Cash only: Pay when Leaving</td>
<td>COLLECT PAYMENT</td>
<td></td>
</tr>
</tbody>
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# Taxonomy of Service Processes

<table>
<thead>
<tr>
<th>Low divergence (standardized service)</th>
<th>High divergence (customized service)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing of goods</td>
<td>Processing of goods</td>
</tr>
<tr>
<td>Processing Information</td>
<td>Information</td>
</tr>
<tr>
<td>Processing of people</td>
<td>Processing of people</td>
</tr>
<tr>
<td></td>
<td>Processing</td>
</tr>
<tr>
<td>No Customer Contact</td>
<td></td>
</tr>
<tr>
<td>Indirect customer contact</td>
<td></td>
</tr>
<tr>
<td>No customer-service worker interaction (self-service)</td>
<td>Supervision of a landing by an air controller</td>
</tr>
<tr>
<td>Operating a vending machine</td>
<td>Sampling an elevator</td>
</tr>
<tr>
<td>Assembling premade furniture</td>
<td>Documenting food at a medical history</td>
</tr>
<tr>
<td>Ordering groceries from a home computer</td>
<td>Driving a rental car</td>
</tr>
<tr>
<td>Withdrawing cash from an ATM</td>
<td>Searching for facility information</td>
</tr>
<tr>
<td>Operating an escalator</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Customer Contact</td>
<td></td>
</tr>
<tr>
<td>Food service worker interaction</td>
<td></td>
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<tr>
<td>Giving a service in a restaurant</td>
<td></td>
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<tr>
<td>Hand car washing</td>
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<tr>
<td>Providing lecture</td>
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<tr>
<td>Handling routine bank transactions</td>
<td></td>
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<tr>
<td>Home public transportation</td>
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<tr>
<td>Providing mass vaccination</td>
<td></td>
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<tr>
<td>Portrait carpet cleaning</td>
<td></td>
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<tr>
<td>Haircutting painting</td>
<td></td>
</tr>
<tr>
<td>Counseling</td>
<td></td>
</tr>
<tr>
<td>Performing a surgical operation</td>
<td></td>
</tr>
</tbody>
</table>

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Generic Approaches to Service Design

- **Production-line**
  - Limit Discretion of Personnel
  - Division of Labor
  - Substitute Technology for People
  - Standardize the Service

- **Customer as Coproducer**
  - Self Service
  - Smoothing Service Demand

- **Customer Contact**
  - Degree of Customer Contact
  - Separation of High and Low Contact Operations

- **Information Empowerment**
  - Employee
  - Customer
Discussion:

- What were / are the key drivers of success?
- What role has technology played?
Discussion

Name

1. An existing service that could be improved by new technology
2. A new service that could be introduced if new technology were developed
3. A technology that hasn’t yet converged to a service