29. Course Review

INFO 210 - 10 December 2007

Bob Glushko
Plan for Today's Class

The important slides and my favorite figures, pictures, and tables

Course / Instructor Evaluations
The Traditional View of Services

Traditional concepts of service management and design emphasize person to person interactions.

This approach focuses on the "touch points" or "encounters" where the service is delivered.

It emphasizes non-technological principles like empowering the employee, knowing the customer.
"Service encounters are critical moments of truth in which customers often develop indelible impressions of a firm... From the customer's point of view, these encounters ARE the service" (Bitner, Brown & Meuter, 2000)

"In most services, quality occurs during service delivery, usually in an interaction between the customer and contact personnel of the service firm" (Zeithaml, Berry, & Parasuraman, 1988)
Quality and the Service System

There may be a “moment of truth” in which the quality of the service experience becomes apparent to the customer, but that quality is enabled or constrained by many interrelated sub-systems or services.

So we need to take a comprehensive and "end-to-end" view of how a service is defined and delivered.

This end-to-end view shows that many of the key determinants of quality are invisible to the customer, and some of them are even invisible to the hotel employees.
From "Service" to "Service Systems"

An emerging view in "service science" is that the SERVICE SYSTEM is the correct framework or perspective for understanding how services work (rather than people, enterprises, or technological implementation).

A service system takes a more abstract view that de-emphasizes the obvious differences between person-to-person services and computational or automated ones.

A service provider's interaction with a service consumer transforms it or something else (information, artifacts, organizations) to create or "co-create" value.

The system of relationships among the participants in a service system follows patterns of value creation and business architecture.

Service systems can be composed from other service systems.
"Service System" Definition (Glushko)

A set of interconnected provider-consumer relationships and the flow of information through them

Every service has at least one service producer and one service consumer

A set of related services can define a SERVICE CHAIN or SERVICE NETWORK or VALUE CHAIN

Designating the last consumer in a service chain as the POINT OF VIEW establishes a perspective or context in the service system
Visualizing a Service System
Point of View in a Service System
Narrow Scope in a Service System
Wide Scope in a Service System
Different Point of View in a Service System
Service as a System of Relationships

A. Service Provider
- individual
- organization
- technology owned or operated by A

B. Service Client
- individual
- organization
- public or private

C. Service Target: The reality to be transformed or operated on by A, for the sake of B
- people, dimensions of
- business, dimensions of
- products, tech. artifacts, and env.
- information, codified knowledge
"Forms of Relationship"

Is the relationship between Provider A and Client B:

- Ad hoc or contractual
- Static or dynamic
- Transactional or "relational"
- Symmetric or asymmetric
- Governed by a "service level agreement" between them
- Governed by some broader authority
The Front Stage and Back Stage of a Service System

Any business is made of two parts:

- **Back stage** (design, manufacturing)
- **Front stage**

<table>
<thead>
<tr>
<th>INDUSTRY SECTOR</th>
<th>SERVICE SECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Back stage</strong></td>
<td><strong>Front stage</strong></td>
</tr>
<tr>
<td><strong>Front stage</strong></td>
<td><strong>Back stage</strong></td>
</tr>
</tbody>
</table>
Front and Back Stages
Models of Service Systems

Because of the great range and diversity of domains we want to describe as service systems, no single modeling approach or formalism is adequate.

Today we looked at service systems in terms of descriptive qualitative properties of connectivity and intensity.

The interactions among the entities in the service system can be described in more formal and quantitative ways.

Modeling approaches also differ in whether they describe static or dynamic aspects of the service system.
"It seems clear that applying scientific management and other closed system logics within service operations is tenuous"

Service systems can be viewed on a structure continuum from Full-service to Restricted service

Technology capabilities should NOT be allowed to determine service system structure; it is much more important to consider the tolerance of the client pool and the skills of the service workers

More service, or more intense service, isn't necessarily better!
The Value Creation Cycle

Service intensity is a useful though somewhat coarse view of the value creation tradeoffs in a service system because it views the service as a whole on the "touch" dimension.

But there can be many potential "touch points" where customer needs can be met.

Service designs differ in how many of these touch points are incorporated into a service offering.

Services also can differ in the extent of interaction and customization with the customer at each point.
Value Creation Cycle in the Hotel Business

- Arrival
- Sleep, wash, rest
- Lunch, dinner
- Room service
- Activities in the hotel
- Breakfast
- Departure
- Reservation
- Finding the hotel
- Awareness of existence

Value creation cycle
The Service-Profit Chain

- Internal Service Quality
- Employee Satisfaction
- Employee Retention
- Employee Productivity
- External Service Value
- Customer Satisfaction
- Customer Loyalty
- Revenue Growth
- Profitability

- Service concept: results for customers
- Retention
- Repeat business
- Referral
- Service designed and delivered to meet targeted customers’ needs

- Workplace design
- Job design
- Employee selection and development
- Employee rewards and recognition
- Tools for serving customers
Oliva & Sterman's Service System Model

- Service Delivery
  - Backlog
  - Order fulfillment
  - Desired service capacity

- Service Capacity
  - Service capacity
  - Learning curve
  - Labor effectiveness
  - Desired total labor
  - Hiring and turnover

- Employee Responses
  - Work pressure
  - Time per order
  - Desired time per order
  - Work intensity
  - Fatigue

- Service Quality
  - Service quality
  - Quality perceptions
  - Quality expectations
  - Quality pressure

- Customer orders
  - Desired service capacity
  - Effective service capacity

- Time per order
  - Quality pressure
  - Eff. of quality on turnover

- Eff. of fatigue on effectiveness
  - Eff. of fatigue on turnover

- Desired time per order
  - Time per order
Demand Vs Capacity - 4 Scenarios

1. Underutilization
   - Cost of idle capacity

2. Optimum capacity utilization
   - Good service quality

3. Queues or reservation systems
   - Lower service quality

4. Insufficient capacity
   - Lost business and revenues
Scheduling [1]

Short-term demand variability can be addressed via cross-training of workers.

And by the use of part-time or temp workers, even in their own homes.

Seasonable variation in demand for services that use low-skill / low-paid workers can also be met by hiring more of them.
Scheduling Challenges in Professional Services

Scheduling is less effective at handling variable demand for services that need highly-skilled and highly-paid professionals to deliver them.

Professional services have significant variability in their resource requirements to begin with.

There are also "non-linear effects in team formation, both super-additive and sub-additive."

Assignments are influenced not just by current needs, but by expected future requirements.
Influencing or Shifting Demand [1]

The most fundamental approach in managing demand is to shift it from periods when it exceeds service capacity (and quality is impaired) to periods of underutilized capacity (when quality can be much better).

PRICE DISCOUNTS for services provided at off-peak times or surcharges for peak times can significantly shift demand.

Demand can also be shifted by offering a comparatively less attractive service package at peak times.

BUNDLING -- offering a combination of several services at a reduced rate -- is another technique for increasing demand at off-peak times.
Influencing or Shifting Demand [2]

PROMOTION AND ADVERTISING can help by branding the idea that services at off-peak times are convenient and desirable (7/11 stores, 24-hour fitness, PSA "midnight flyer")

RESERVATIONS enable a service provider to schedule or shift demand, and coupled with YIELD MANAGEMENT pricing mechanisms can either increase revenue or increase effective capacity
Influencing or Shifting Demand [3]

SMOOTHING of demand is accomplished by moving any discretionary or schedulable services away from periods of high variable demand and toward periods of low variable demand.

- Emergency calls and preventive action have different origins. Emergency calls are often highly uncertain and random, whereas preventive action can be planned.
- But some "emergencies" are highly predictable.

Demand can also be smoothed by RESOURCE POOLING, as in the case of a typing pool or a centralized call center that handles calls for numerous time zones or companies.

LOYALTY PROGRAMS smooth demand by offering customers free or upgraded services that would otherwise go unused to increase their likelihood of buying services at other times.
Managing Demand in Queues

If demand and supply are still out of balance and there is no option to reserve in advance, customers have to wait in line, at the risk that some may leave and switch.

The advantage of queues for the service provider is that they keep personnel busy and facilities and equipment fully utilized.

As the rate of arrivals nears the service rate, the average length of the queue will quickly increase.

An imbalance of supply and demand has different impact on the front and back stages of a service system.
The Call Center State Model

Diagram:
- Arrivals
- Retrials
- Busy
- ACD
- Queue
- Abandon
- Lost calls
- Front
Queuing Theory

Simple Model: Palm/Erlang-A

arrivals \( \lambda \) → queue → agents

abandonment \( \theta \) →

1

2

\( \ldots \) →
n

\( \mu \)

Erlang-A Parameters (Math. Assumptions):

- \( \lambda \) – Arrival rate (Poisson)
- \( \mu \) – Service rate (Exponential)
- \( \theta \) – Impatience rate (Exponential)
- \( n \) – Number of Service-Agents.
Call Center Data Regularity

Arrival Rates on Tuesdays in a September – U.S. Bank

![Graph showing arrival rates on Tuesdays in a September for U.S. Bank.](image)
The Business EcoSystem
Supply Chain Conceptual Model
University as Service Marketplace
"Staple Yourself to an Order" -- Organizational Responsibilities

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>plans to buy</td>
<td>1. Order planning</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>coordinates</td>
</tr>
<tr>
<td>gets sales pitch</td>
<td>2. Order generation</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>some</td>
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<tr>
<td>negotiates</td>
<td>3. Cost estimation and pricing</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>some</td>
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<tr>
<td>orders</td>
<td>4. Order receipt and entry</td>
<td>○</td>
<td>●</td>
<td>○</td>
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<td>none</td>
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<tr>
<td>waits</td>
<td>5. Order selection and prioritization</td>
<td>○</td>
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<td>○</td>
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<td>some</td>
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<tr>
<td>waits</td>
<td>6. Scheduling</td>
<td>○</td>
<td>●</td>
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<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>none</td>
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<tr>
<td>accepts delivery</td>
<td>7. Fulfillment</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>none</td>
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<tr>
<td>pays</td>
<td>8. Billing</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>none</td>
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<tr>
<td>negotiates</td>
<td>9. Returns and claims</td>
<td>●</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>○</td>
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<td>○</td>
<td>some</td>
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<tr>
<td>complains</td>
<td>10. Post-sales service</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>none</td>
</tr>
</tbody>
</table>
Architectures for Personalization

(a) Provider-centric

(b) Consumer-centric

(c) Market-centric
Architecture Co-Evolution

Vertical
1980s and Earlier

Horizontal
1980s and 1990s

Ecosystem
The New World

Monoliths
Structured
Client/Server
3-Tier
N-Tier
Distributed Objects
Components
Services
Component Business Map -- Generic
Before Service Composition
After Service Composition
Web Services Abstract View

- Service Registry
  - Business Process
  - Service
  - Service Description
  - Service Communication Protocol
  - Transport

- Quality of Service
  - Policy
  - Security
  - Transaction
  - Management
Drop Shipment
Overlapping Information Models
"Document Engineering" Design Process
[Glushko & McGrath]
Blueprinting Methodology: "Metamodel"

<table>
<thead>
<tr>
<th>Physical Evidence</th>
<th>Line of Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Actions</td>
<td>Line of Visibility</td>
</tr>
<tr>
<td>Onstage Contact Employee Actions</td>
<td>Line of Internal Interaction</td>
</tr>
<tr>
<td>Backstage Contact Employee Actions</td>
<td></td>
</tr>
<tr>
<td>Support Processes</td>
<td></td>
</tr>
</tbody>
</table>
Service Blueprint for Overnight Hotel Stay
Contrasting Design Goals for Methodologies

- Front Stage Designers
  - Usability
  - Responsiveness
  - Flexibility / Customization / Uniqueness
  - Transparency
  - Enjoyment

- Back Stage Designers
  - Efficiency / Productivity
  - Robustness
  - Standardization / Reuse
  - Scaleability
# The Technology Infusion Framework

## Drivers of Service Encounter Satisfaction

<table>
<thead>
<tr>
<th>Technology as Enabler for</th>
<th>Customization / Flexibility</th>
<th>Effective Service Recovery</th>
<th>Spontaneous Delight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>Technology can be used by contact employees to improve the efficiency and effectiveness of service encounters by enabling customization, improving service recovery and spontaneously delighting customers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Industry Examples:</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• AT&amp;T</td>
<td>• General Electric</td>
<td>• Progressive Corp.</td>
</tr>
<tr>
<td></td>
<td>• Streamline</td>
<td>• USAA</td>
<td>• Ritz Carlton</td>
</tr>
<tr>
<td></td>
<td>• Individual Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>Technology can be used independently by customers to improve the efficiency and effectiveness of their own service encounter experience by enabling customization, improving service recovery and providing spontaneous delight.</td>
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<tr>
<td></td>
<td><strong>Industry Examples:</strong></td>
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<tr>
<td></td>
<td>• Amazon.com</td>
<td>• Hartness Intl.</td>
<td>• Cisco</td>
</tr>
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<td></td>
<td>• Wells Fargo</td>
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<td></td>
<td>• Federal Express</td>
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</tbody>
</table>
Microsegmentation to Prevent "Adverse Selection"
The "Installed Base Service Space"

<table>
<thead>
<tr>
<th>Product-oriented services</th>
<th>End-user’s process-oriented services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transaction-based services</strong></td>
<td><strong>Professional services</strong></td>
</tr>
<tr>
<td>Basic installed base services</td>
<td>Process-oriented engineering</td>
</tr>
<tr>
<td>Documentation</td>
<td>(tests, optimization, simulation)</td>
</tr>
<tr>
<td>Transport to client</td>
<td>Process-oriented R&amp;D</td>
</tr>
<tr>
<td>Installation/commissioning</td>
<td>Spare parts management</td>
</tr>
<tr>
<td>Product-oriented training</td>
<td>Process-oriented training</td>
</tr>
<tr>
<td>Hot line/help desk</td>
<td>Business-oriented training</td>
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<tr>
<td>Inspection/diagnosis</td>
<td>Process-oriented consulting</td>
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<tr>
<td>Repairs/spare parts</td>
<td>Business-oriented consulting</td>
</tr>
<tr>
<td>Product updates/upgrades</td>
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<tr>
<td>Refurbishing</td>
<td></td>
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<td>Recycling/machine brokering</td>
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<tr>
<td><strong>Relationship-based services</strong></td>
<td><strong>Operational services</strong></td>
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<tr>
<td>Maintenance services</td>
<td>Managing maintenance function</td>
</tr>
<tr>
<td>Preventive maintenance</td>
<td>Managing operations</td>
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<tr>
<td>Condition monitoring</td>
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<tr>
<td>Spare parts management</td>
<td></td>
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<tr>
<td>Full maintenance contracts</td>
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</table>
Automotive Ecosystem Member
Service Quality Gap Model (Zeithami, Berry, & Parasuraman)
Investing in Prevention

![Diagram showing the relationship between internal and external failure costs, detection inspection cost, prevention cost, failure cost, and total cost of nonconformance for Situation 1 and Situation 2. The diagram illustrates the investment in learning, training, anticipation, and knowledge.]
# Self Service Categories and Examples (from MMRB)

<table>
<thead>
<tr>
<th>Interface Purpose</th>
<th>Telephone/Interactive Voice Response</th>
<th>Online/Internet</th>
<th>Interactive Kiosks</th>
<th>Video/CD*</th>
</tr>
</thead>
</table>
| Customer Service  | • Telephone banking  
                    • Flight information  
                    • Order status       | • Package tracking  
                    • Account information | • ATMs  
                    • Hotel checkout      |           |
|                   | • Telephone banking  
                    • Prescription refills | • Retail purchasing  
                    • Financial transactions | • Pay at the pump  
                    • Hotel checkout  
                    • Car rental         |           |
| Self-Help         | • Information telephone lines  
                    • Internet information search  
                    • Distance learning | • Blood pressure machines  
                    • Tourist information | • Tax preparation software  
                    • Television/CD-based training |           |
Open Table -- Online Restaurant Reservations

![OpenTable.com interface](image-url)
Service Outcomes - S & B Model
"Multichannel Services" for Sousa and Voss
Defining Multichannel Services [2]

Let's define channel as "a means by which suppliers of goods or services provide access to them"

So any service that offers customers more than one way to obtain a service is "multichannel"

This broader definition admits different chain stores or franchise outlets, different bank branches, etc. as multiple channels
Maintaining Multiple Channel Service Quality in Dublin
Sears catalogs and stores formed an important multichannel service for much of the 20th century in the US
The Right Mix of "Bricks and Clicks"

The integration-separation decision is not a binary choice. Different companies will need to follow very different paths in deciding how closely—or loosely—to integrate their Internet initiatives with their traditional operations.
Emerging Considerations

Many devices can support multiple channels - eg a phone or PDA can have phone, computing, SMS and Internet capability

Users in a ubiquitous computing world will interact with several devices simultaneously. This multi- or federated-device interaction paradigm presents significant design challenges

"Web 2.0" applications can be thought of as multichannel services in which one or more of their channels are controlled by other customers
The End... Or Maybe Not

This is the end of the course... except for your term papers due by December 18 (submit by email to both instructors)

If you want to see more of Professor Saxenian: Advanced Reading Seminar in Information, Communications and Development (Spring 2008, M 12-2)

If you want to see more of me: Document Engineering & Information Architecture (Spring 2008, MW 9-10:30), Information Systems & Service Design (Fall 2008, MW 2-3:30)