25. Models and Measures of Quality [2]

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Plan for ISSD Lecture #25

Usability in context(s)

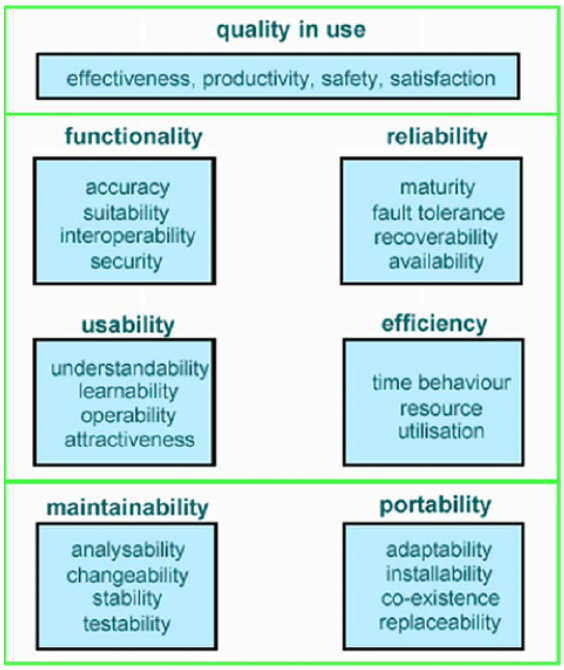
- Back stage / software architecture implications
- Usability feature preferences

Quality in technology-based service encounters

Service failure and recovery

Quality as a provider-consumer contract and SLAs

Quality of Information Systems



"Usability Methods" and the Design Lifecycle

Evaluation method	Stages in software development cycle				
	Requirement analysis	Design	Code	Test	Deployment
Proactive field study	✓				
Pluralistic walkthroughs		✓			
Teaching method		✓	✓	✓	
Shadowing method		✓	✓	✓	
Co-discovery learning		✓	✓	✓	
Question-asking protocol		✓	✓	✓	
Scenario based checklists		✓	✓	✓	✓
Heuristic evaluation		✓	✓	✓	✓
Thinking-aloud protocol		✓	✓	✓	✓
Cognitive walkthroughs		✓	✓	✓	✓
Coaching method		✓	✓	✓	✓
Performance measurement		✓	✓	✓	✓
Interviews		✓	✓	✓	✓
Retrospective testing		✓	✓	✓	✓
Remote testing		✓	✓	✓	✓
Feature inspection			✓	✓	✓
Focus groups				✓	✓
Questionaires				✓	✓
Field oberservation				✓	✓
Logging actual size				✓	✓

Assumptions and Implications for "Usability Methods"

Because requirements evolve and are refined during the design lifecycle, some early stage usability methods can only partly predict the usability of the deployed system or service

Some usability methods require a working system or prototype and the involvement of users, neither of which might be available during early stages of the design lifecycle

So there's potential conflict between software architecture - which is an early stage activity - and late stage usability efforts

"Interface" {and,or,vs} "Interaction" Usability and Quality

Simplistic analyses and design recommendations for usability of systems (or services) emphasize the presentation of information in the user interface (or "front stage")

But it is better to emphasize the broader concept of "interaction" - the coordination of information exchange between the user and the system (or service provider)

Furthermore, the effective use of information in the "back stage" can make some information exchanges and interactions unnecessary

(e.g., in "self-service" and other "technology-intensive" service systems)

The Relationship between Usability Recommendations and Software Development

(From Juristo et al. "Analyzing the impact of usability on software design")

Recommendations that impact (only) the UI -- can be accommodated late in the design lifecycle if the presentation layer is cleanly separated in the sw architecture

Recommendations that impact the development process -- the essence of "user-centered" or "outside-in" design is greater and more continuous involvement of users and stakeholders

Recommendations that impact the software design - usability features with implications for "back stage" sw architecture

Functional Usability Features that Impact Software Design

System feedback

Undo

Cancel

Form/field validation

Wizard

Adaptation to user expertise

Multi-level help

Internationalization/localization

Alerting

Functional Usability's Impact on Software Engineering

Summary	FUF-Functionality	FUF-Classes	FUF-Methods Complexity	FUF-Interactions
Feedback	High 90%	Low 27%	Medium	Medium/high 66%
Undo	Medium 40%	Low 10%	High	Medium/high 66%
Cancel	Medium 95%	Low 8%	High	Medium/high 66%
User input errors prevention/correction	Medium 36%	Low 11%	Medium	Low 6%
Wizard	Low 7%	Low 10%	Low	High 70%
User Profile	Low 8%	Medium 37%	Medium	Low 10%
Help	Low 7%	Low 6%	Low	High 68%
Use of different languages	Medium 51%	Low 10%	Medium	High 70%
Alert	Low 27%	Low 7%	Low	Medium/high 66%

UI Characteristics and "Importance"

(from Valacich et al., "The Online Consumer's Hierarchy of Needs")

Not all user interface characteristics are equally important in determining the quality of the user experience

Furthermore, the relative importance of UI features varies in different online contexts

STRUCTURAL FIRMNESS features are essential for a system to meet minimal requirements and are largely "back stage"

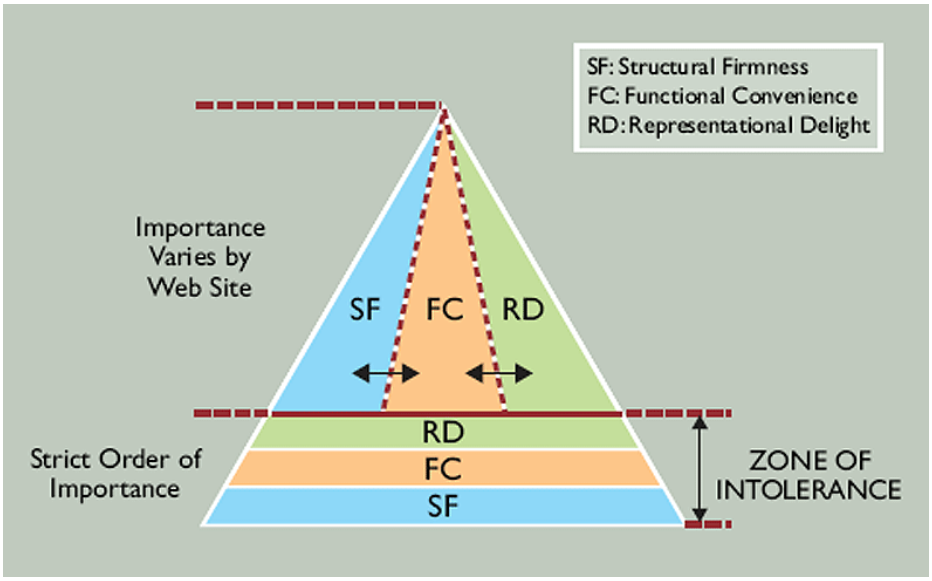
FUNCTIONAL CONVENIENCE features are typical "front stage" ones

REPRESENTATIONAL DELIGHT features create the aesthetic and empathic dimensions of experience

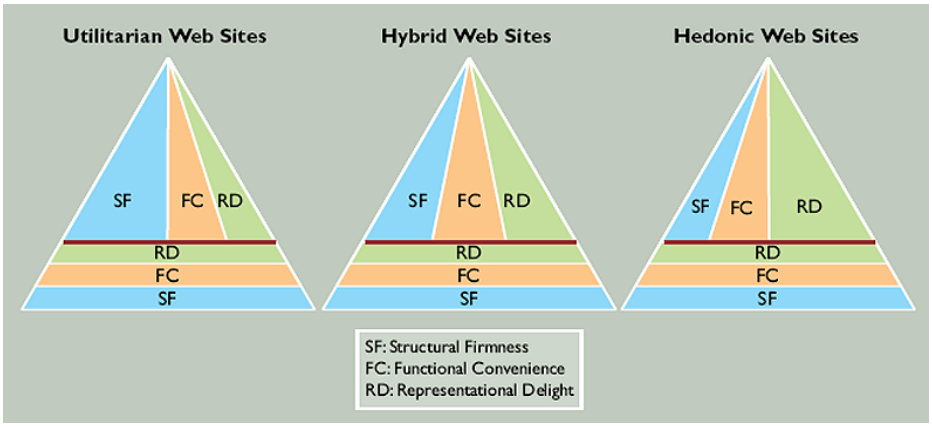
UI Feature Categories and Examples

Functional Convenience	Representational Delight	Structural Firmness
Ease of navigation	Interface consistency	Response time
Ease of use	Screen size and layout	Quick error recovery
Provision of product/ service information	Provision of a visually appealing design	Correct operation (such as, no bad links)
Feedback options	Innovative and creative design	Quality of firewalls
One-click ordering (for example, amazon.com)	Pleasant background color	Provision of privacy policies
Order tracking information	Use of graphics	Explicit security policies
Provision of help feature	Provision of video/ audio links	Availability of security seals
Variety of payment methods		

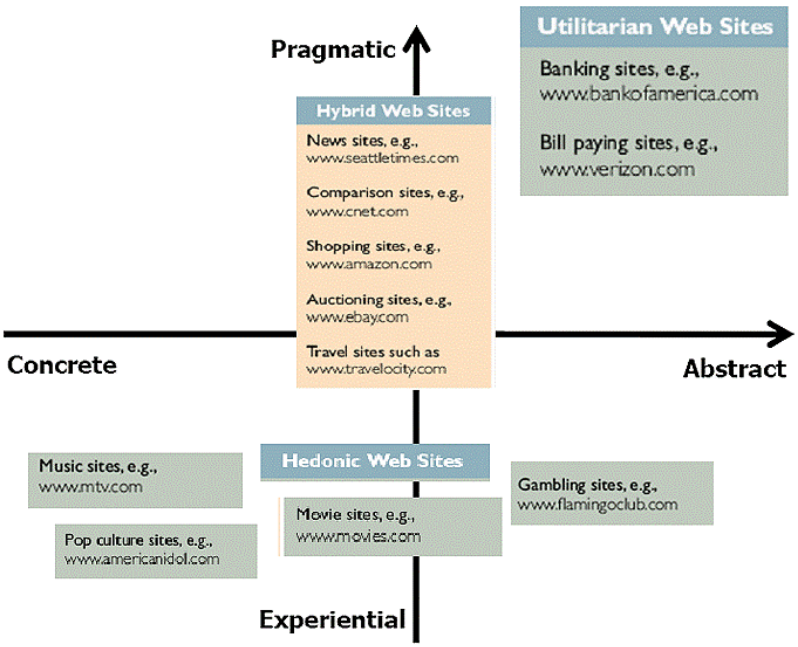
Online Consumer's Needs Hierarchy



UI Features X Site Types



Site Types X Context Dimensions



The Experience - Information Continuum and "Self-Service"

People	Systems
'experience-intensive'	*'information-intensive'*

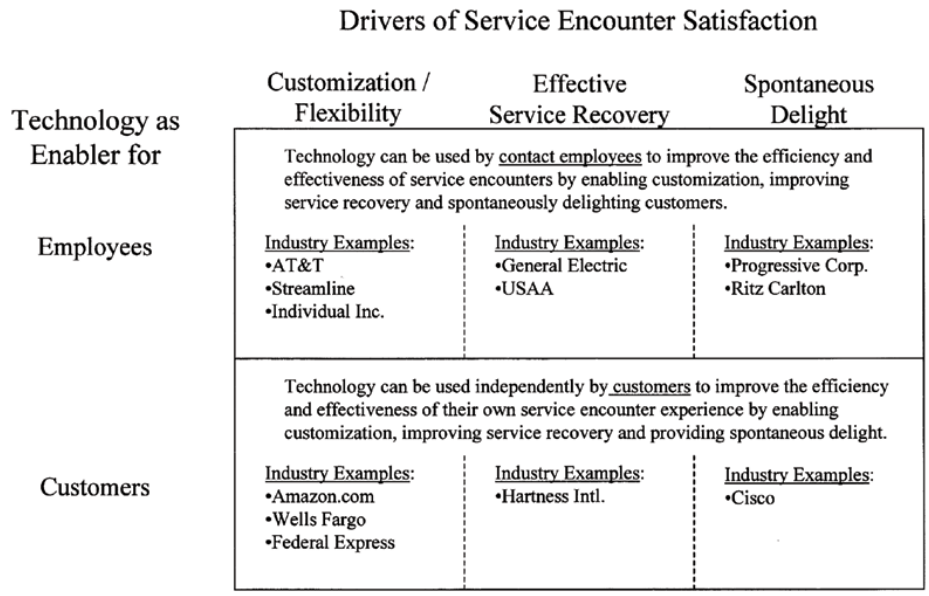
(FROM 10/29) Service Intensity: Levels / Numbers of Touch Points

The intensity or number of touch points required of a service customer varies between services and between different offerings of the same type of service

Some services are standardized and never customized to specific customer

Others can be adapted if the customer requests and participates in the adaptation by providing information or preferences

Technology Infusion Framework (from Bitner et al)



Technology Used by Contact Employees

Customer databases

Sales force automation

Call center management

Product information; help desk applications

Product and price configurators

Self-Service

"Self-service" isn't the same as "Do it yourself"

In "Self-service" a service provider takes an activity formerly performed by an employee and allows/requires the customer to do it, generally to reduce costs

The customer might do the same work done previously by the employee, using the same facilities or equipment (e.g., laundromat, cafeteria)

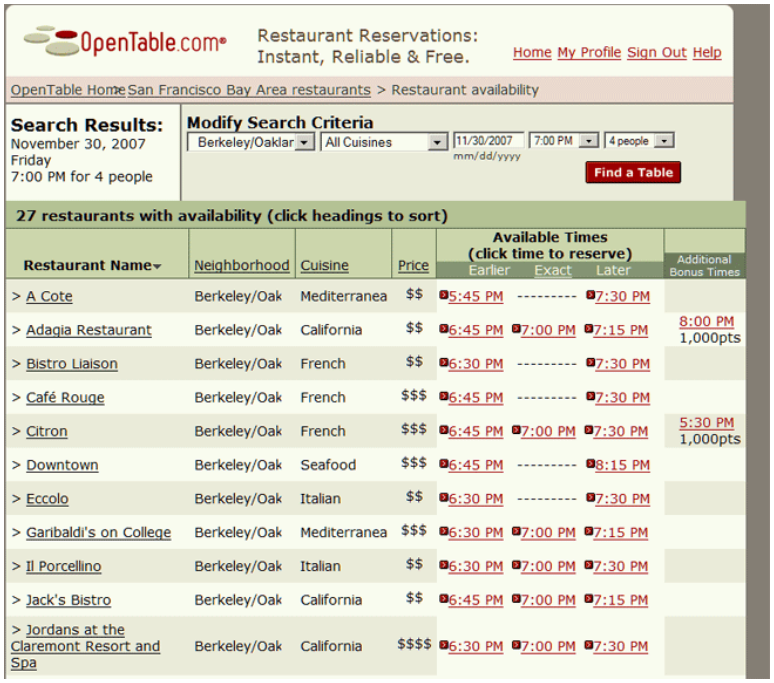
But more often the employee has been replaced with an automated system involving software and/or equipment (e.g., ATMs, kiosks, touch tones -> IVR, web sites for commerce, tracking, etc.)

Self-service allows for 7-day, 24-hour services and this flexibility and convenience is valuable to customers

Self Service Categories and Examples (from Meuter et al)

Interface / Purpose	Telephone/Interactive Voice Response	Online/ Internet	Interactive Kiosks	Video/CD*
Customer Service	•Telephone banking •Flight information •Order status	•Package tracking •Account information	•ATMs •Hotel checkout	
Transactions	•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 Restaurant Reservations: Instant, Reliable & Free.

Home My Profile Sign Out Help

OpenTable Home > San Francisco Bay Area restaurants > Restaurant availability

Search Results:
November 30, 2007
Friday
7:00 PM for 4 people

Modify Search Criteria
Berkeley/Oaklar | All Cuisines | 11/30/2007 (mm/dd/yyyy) | 7:00 PM | 4 people
Find a Table

27 restaurants with availability (click headings to sort)

Restaurant Name	Neighborhood	Cuisine	Price	Available Times (click time to reserve) Earlier	Exact	Later	Additional Bonus Times
> A Cote	Berkeley/Oak	Mediterranea	$$	5:45 PM	---------	7:30 PM	
> Adagia Restaurant	Berkeley/Oak	California	$$	6:45 PM	7:00 PM	7:15 PM	8:00 PM 1,000pts
> Bistro Liaison	Berkeley/Oak	French	$$	6:30 PM	---------	7:30 PM	
> Café Rouge	Berkeley/Oak	French	$$$	6:45 PM	---------	7:30 PM	
> Citron	Berkeley/Oak	French	$$$	6:45 PM	7:00 PM	7:30 PM	5:30 PM 1,000pts
> Downtown	Berkeley/Oak	Seafood	$$$	6:45 PM	---------	8:15 PM	
> Eccolo	Berkeley/Oak	Italian	$$	6:30 PM	---------	7:30 PM	
> Garibaldi's on College	Berkeley/Oak	Mediterranea	$$$	6:30 PM	7:00 PM	7:15 PM	
> Il Porcellino	Berkeley/Oak	Italian	$$	6:30 PM	7:00 PM	7:30 PM	
> Jack's Bistro	Berkeley/Oak	California	$$	6:45 PM	7:00 PM	7:15 PM	
> Jordans at the Claremont Resort and Spa	Berkeley/Oak	California	$$$$	6:30 PM	7:00 PM	7:30 PM	

But Some People Can't or Won't Use Self-Service

Who prefers self-service? (or avoids face-to-face encounters)

Who prefers face-to-face encounters? (or avoids self-service)

Expectations About Self-Service Can Vary Widely

In self-service the user assumes more responsibility for the quality of the experience... and this may not be what they want or expect

Is self-service an attractive experience or alternative?

Or am I being forced to use it to benefit the service provider?

My experience will be more predictable than a face-to-face encounter...

But my experience might be more limited than a face-to-face encounter

And of course, the provider and consumer can have widely differing expectations about the same encounter

Self-Service From the Provider's Perspective

Primary or initial goal is generally to increase delivery efficiency and productivity and thus reduce operational costs

Increase reach of service, improve market share

Differentiate through a technology leader reputation

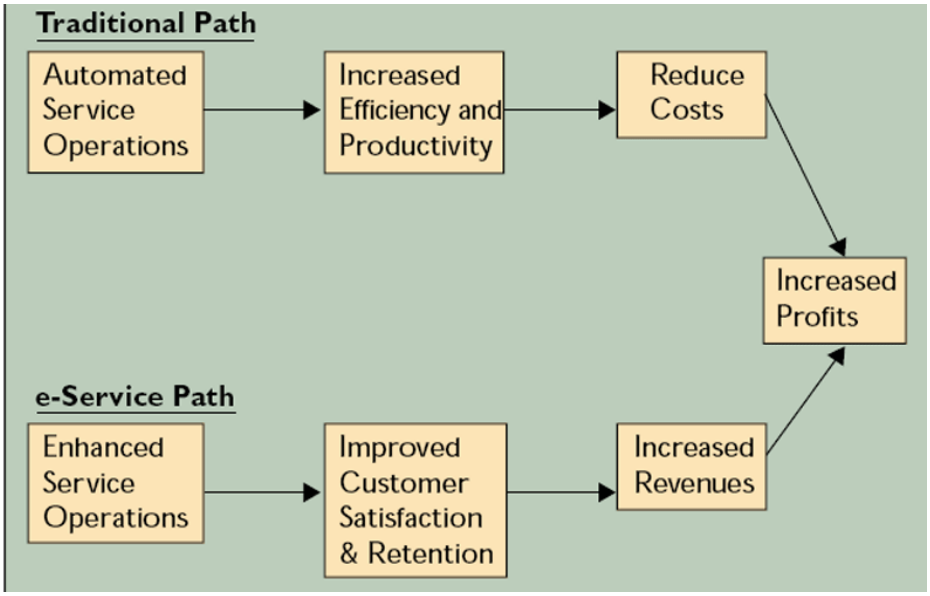
Reduce undesirable variability and increased desirable personalization

The Provider's Dilemma

Customer preferences for face to face service, or aversion to self-service prevent the provider from getting these benefits

So how does a provider induce customers to adopt self-service?

Toward "Customer-Centered" Self-Service



When Self-Service Is Satisfying

It saves time

It is easy to use

It solves an "intensified" need (urgent situations)

It saves money

It enables location independence

It enables time independence

It obviates the need to interact with inefficient, incompetent, or unlikable people

It seems remarkable that it works at all (novelty?)

When Self-Service Isn't Satisfying

When the technology fails

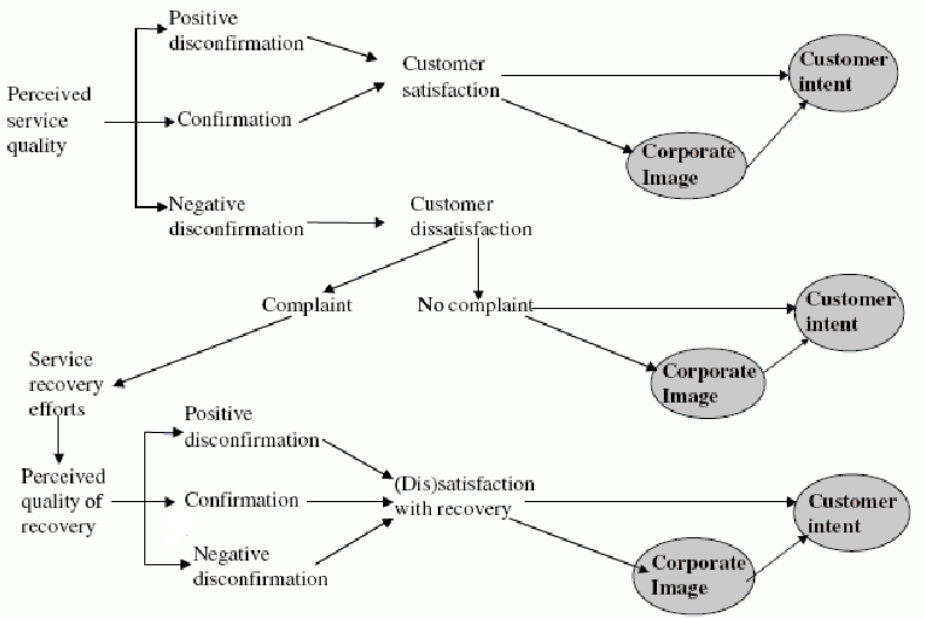
When some "downstream" process fails

When the design of the technology/UI has flaws

When the design is too limited

When the user did something (or didn't do something) that resulted in a failure

Service Outcomes



Service Failure and Recovery

A *Service Failure*
occurs when a service encounter falls short of the customer's expectations (negative disconfirmation)

If the customer signals this outcome to the service provider, *Service Recovery* actions might be made in response

The worst perceptions of service arise when employees' inability or unwillingness to respond to service failures, because this represents a "double deviation" from customer expectations of service organizations

A recent multiple industry study showed that service failures and failed recoveries accounted for almost 60 percent of customer "defections" or switching to competitor service providers

The Service Recovery Paradox

Service system failures can be perceived as highly satisfactory encounters if proper recovery measures are taken

Some service researchers have suggested the existence of a "service recovery paradox" in which customers whose service failures had been satisfactorily remedied seemed to be more satisfied, more likely to remain loyal, and more likely to engage in favorable word-of-mouth about the company than customers who had never experienced a failure

But does this mean that organizations should welcome service failures as opportunities to delight customers?

Or is it better for organizations to focus on the importance of "doing it right" the first time?

Technology for Service Recovery [1]

Service Recovery Feature	Technology Enabler(s)	Customer Benefit	Provider Benefit
Review complaint mechanisms	Online feedback forms	Instant feedback, very easy to complain	Automated entry of feedback data, facilitates automated classification and routing of service failures
Explain the recovery process and keep customers informed	Electronic status reports via Web pages or automated email	Real-time, on-demand status updates	Reduces needs for paper-based reports, also increases timeliness of information and internal status reporting
Classify and route	Genetic algorithms, neural networks, fuzzy logic	Faster, more streamlined process if service failure is classified and routed properly	Intelligent classification and routing, allows automation of the routing process
Offer a way out	Online chat sessions with live representatives	Immediate access to customer service representatives without leaving the main recovery mechanism (the Web site)	Lower costs (e.g., fewer 800 numbers for customer support)

Technology for Service Recovery [2]

Service Recovery Feature	Technology Enabler(s)	Customer Benefit	Provider Benefit
Value failure data	Data warehousing and data mining	Improved service and recovery efforts in future experiences	Analysis and synthesis of trends and profiles of service recovery encounters
Earmark severe failures	Intelligent agents	Personalized service, evidence of provider empathy	Easier recognition of "severe failures," possibly using agents to define severity based upon user reaction
Remember to follow up	Automated email, electronic surveys	Ease of use, convenience	Cheaper, easier to target, and easier to administer than paper-based followups

Smith & Bolton Model

(Smith, A.K., & Bolton, R.N. (1998). An experimental investigation of customer reactions to service failure and recovery encounters: Paradox or peril?)

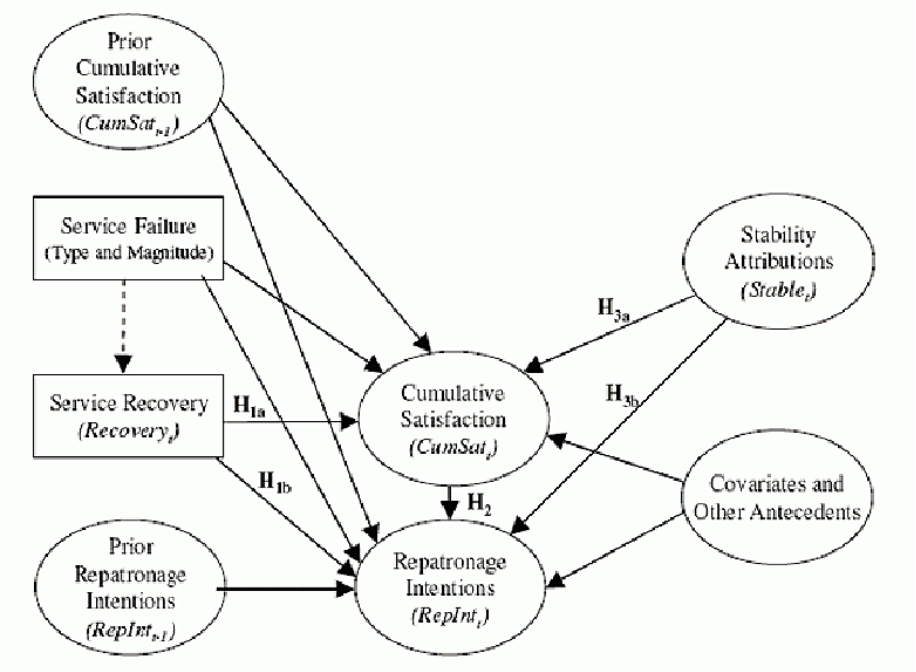
S & B model of customer satisfaction and "repatronage intention" distinguishes cumulative satisfaction from transaction-specific satisfaction

"Stability attributions" play an important role in customers' judgments after a service failure

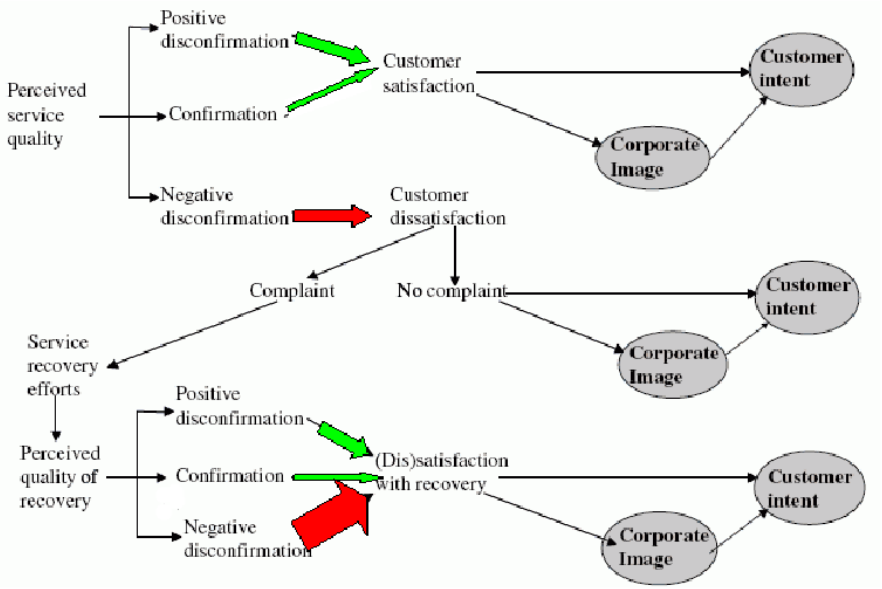
Customers' cumulative satisfaction and repatronage intentions are more strongly influenced by extreme levels of service -- that is, by very good or very poor recovery efforts in response to a service failure.

And poor process-driven recovery efforts are the most damaging to customer satisfaction

Smith & Bolton Model



Service Outcomes - S & B Model



Motivating Service Level Agreements

The SERVQUAL framework and common sense tells us that customer satisfaction about a service depends on having appropriate expectations about it

For B2C services, these expectations about the level of service are established by marketing communications or by other qualitative and informal/indirect mechanisms

For B2B services or "insourced" services, expectations are often created by and reinforced by standards (which might be embodying design patterns) or by an explicit SERVICE LEVEL AGREEMENT

In both B2C and B2B contexts, the idea that services are "co-produced" also implies that the provider and consumer exchange information about what kind of value to produce and how to produce it

Defining Service Level Agreements

(from the "Panacea or Pain" article)

An SLA is an AGREEMENT or contract between the service provider and its customers that quantifies the minimum quality of service that satisfies business needs

- Usually negotiated between the provider and consumer (but occasionally dictated by the former)
- The level of service is defined with objective measures that are closely tied to specific customer requirements
- The delivered quality is the minimum acceptable but there is no expectation that it will be exceeded

SLA at UC Berkeley

The UC Berkeley Information Systems and Technology organization has become substantially more customer-oriented in recent years after a new CIO was hired with a private-sector background

A service catalog
clearly defines the services that IS&T offers to students, faculty, and campus departments (http://ist.berkeley.edu/services)

See the SLA for "Departmental Onsite Computing Support"

Typical Quality Measures Governed by an SLA

Availability

Performance / Time to Deliver

Throughput / Capacity

Security

Support - Preventive and Urgent Maintenance

Monitoring and Reporting

Problem Management and Escalation

SLA and Information Exchange

An SLA imposes measurement and reporting obligations on the provider and enforces them by imposing penalties for failure to meet the SLA

But it also encourages or requires the customer to provide accurate demand forecasts and adhere to them (because the SLA will likely contain penalties or surcharges for excessive demand)

These reciprocal information exchanges converge expectations, reduce variability, and usually improve the efficiency of the service delivery

Readings for 1 December

D. Adomavicius & A. Tuzhulin “Personalization technologies: A process-oriented perspective” Communications of the ACM, October 2005.

Lorrie Faith Cranor, “I didn’t buy it for myself: Privacy and ecommerce personalization” in Clare-Marie Karat, Jan O. Blom, and John Karat (ed.), Designing Personalized User Experiences in eCommerce. Kluwer Academic Publishers, 2004.

Juha Tiihonen, Mikko Heiskala, Kaija-Stiina Paloheimo, & Andreas Anderson, “Applying the configuration paradigm to mass-customize contract based services” The World Conference on Mass Customization & Personalization (MCPC), 2007