Service Innovation Using Design Patterns

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30 September 2010

Outline for the Talk

A Taxonomy of Service Design Patterns

Front Stage / Back Stage, Line of Visibility, and Point of View

Service Intensity and Touchpoints

Componentization, Aggregation and Disaggregation

Seven Contexts as Building Blocks for Service Systems

About the Speaker

Academic training in experimental psychology, software engineering, and cognitive science

10 years in industry research and development (mostly at Bell Laboratories)

10 years as an entrepreneur, founder or co-founder of 4 companies (electronic publishing and e-business)

8 years as an adjunct full professor at Berkeley; teach "intellectual foundations of information organization" and "information systems and service design"

Motivation for Service Design Patterns

Because services are often less tangible or more abstract than products, service descriptions are more amenable to conceptual manipulation

As "service" moves beyond traditional person-to-person services to self-service, web services, computer-to-computer service we are induced to take a more abstract perspective to emphasize what they have in common

There have been many efforts to devise abstract frameworks or patterns that describe business models or service systems, or "families" of related business models or service systems

Many of these are centered around the increasing role of information and communication technologies in enabling new patterns of business architecture

In this talk I will review some design patterns or models for services and show how thay can be exploited systematically to invent new or improved services

What Are Patterns?

A *Pattern* is a model that is sufficiently general, adaptable, and worthy of imitation that it can be reused

It must be *general* so that it can apply to a meaningfully large set of possible instances or contexts

It must be *adaptable* because the instances or contexts to which it might apply will differ in details

It must be *worthy* because the instances or contexts to which it might apply are supposed to benefit by following the pattern rather than being impaired

Why We Use Patterns

Assist in analysis

Expose inefficiencies

Encourage best practices

Simplify / consolidate / remove redundancies

Enable transparent substitution

Facilitate generalization and specialization

The "Service System"

Defined as “Value co-creation configurations of people, technology, and value propositions that interconnect service systems, and shared information” (Maglio et al 2006)

Has rapidly become the conventional unit of analysis in services research and design

But its comprehensiveness, abstractness, and recursiveness poses some challenges in scoping and boundary-setting

How natural is it as a way to describe a configuration of services?

Models and Patterns for Service Systems

Many academic fields – management, operations research, informatics, etc. – provide models for describing service systems and design patterns

These models distinguish and highlight different aspects of the same service system

Can be thought of as different perspectives or points of view

A Taxonomy of Models [1]

Physical Models - emphasize the physical / spatial / topological arrangement of services

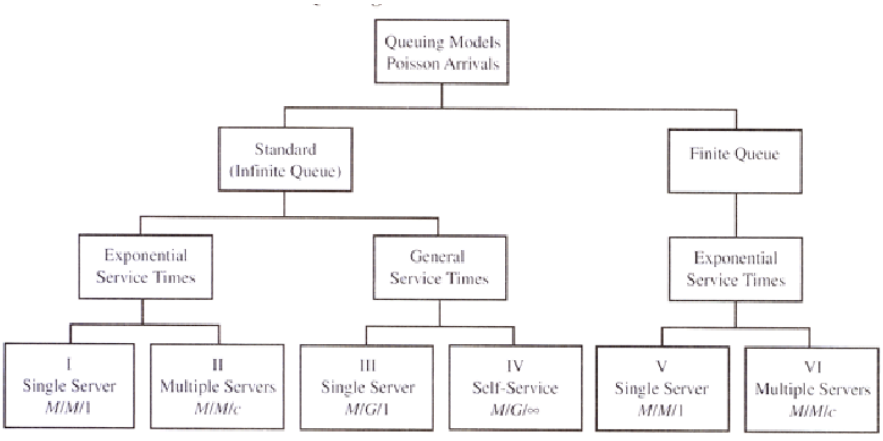
IE/OR models - emphasize operational behavior or performance

- Queuing models
- System dynamics models

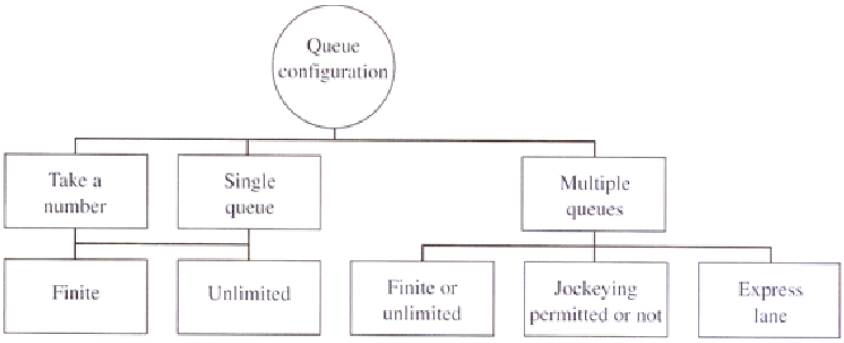
Physical Model

Physical Model

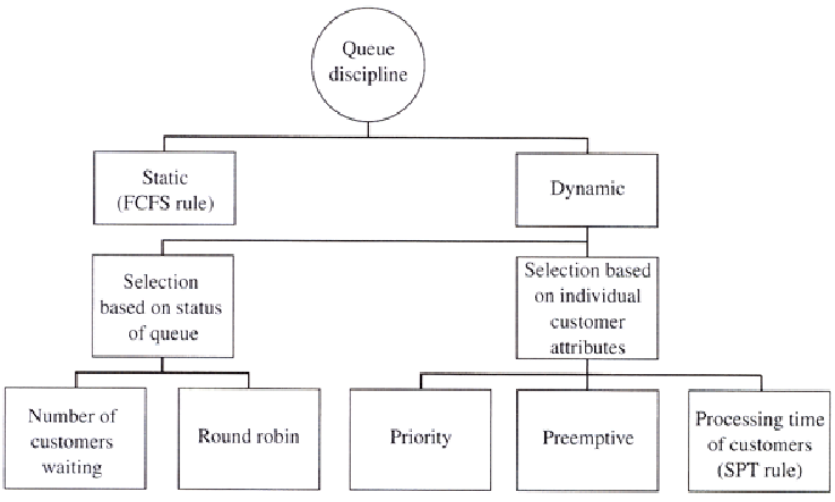
Queue Models



Queue Models - Configurations



Queue Models - Disciplines



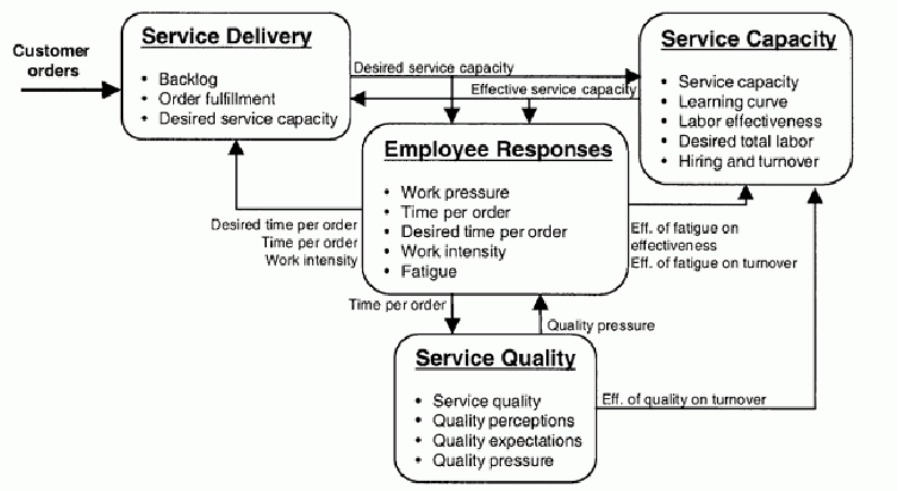
System Dynamics Models

Descriptive models that depict dimensions or stores of value creation and their dependencies using feedback links

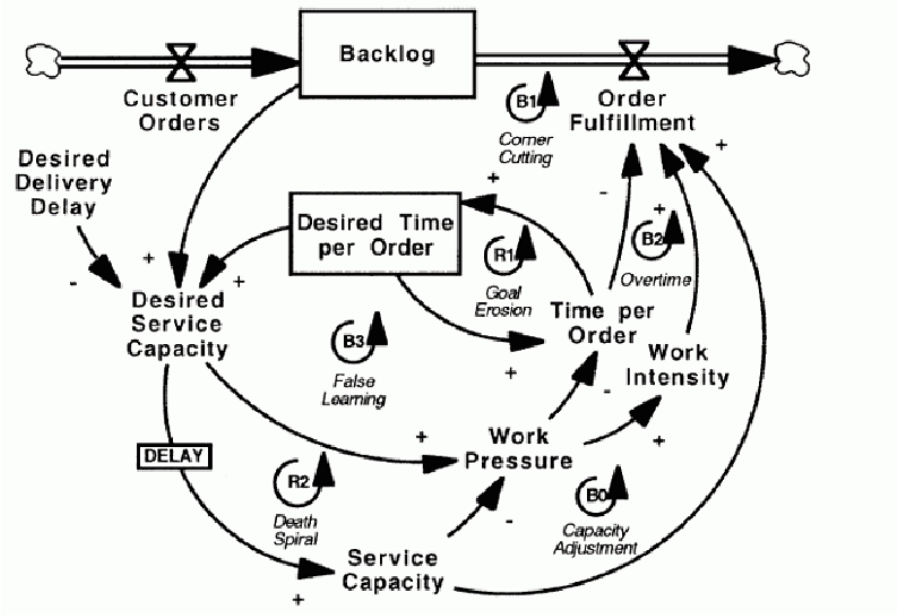
Widely applicable but arbitrary types and number of parameters makes each model very context-specific

"Cutting Corners and Working Overtime" - Model

Cutting Corners and Working Overtime: Quality Erosion in the Service Industry Rogelio Oliva, John D. Sterman, *Management Science,* Vol. 47, No. 7 (Jul., 2001), pp. 894-914



Feedback Structure in Dynamical Model



A Taxonomy of Models [2]

Value Creation Focused Models - emphasize how customer value is created

- Blueprint or touchpoint models
- Value chain models

Functional Models - emphasize what the services do, how they are combined or interconnected

- Business Model / Organizational Perspective
- Process Perspective
- Information Flow / Document Exchange Perspective

"Blueprint" or "Touchpoint" Models

Emphasize the interactions between an human employee and a human customer

In traditional service methods these "service encounters" are a critical focus

- Every encounter is an opportunity for the firm to satisfy the customer, to reinforce the value of its offerings, and to sell the customer on the benefits of a long-term relationship
- Encounters immediately impact customer satisfaction and also shape longer-term factors like intention to return, likelihood of communicating positively about the service, and customer loyalty

Service == Service Encounter

"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, & Pararsuraman, 1988)

The Front Stage / Back Stage Distinction

This focus on the "last" encounter implies a sharp distinction between the visible interactions and invisible activities that precede it to make it possible

Front Stage: Where interactions with the service customer/consumer happen

Back Stage: Produces information and "stuff" needed in the front stage

Placement of the "Line of Visibility" is a design parameter: how many services to expose in the front stage

McDonald's Restaurant

Gourmet Restaurant

Benihana Restaurant

The Front Stage Designer's Mindset

Strive to create service experiences that people find enjoyable, unique, and responsive to their needs and preferences

Use techniques and tools from the disciplines of human-computer interaction, anthropology, and sociology such as ethnographic research and the user-centered design

Capture and communicate designs using modeling artifacts that include personas, scenarios, service blueprints, and interactive prototypes

The Back Stage Designer's Mindset

Identify and analyze information requirements, information flows and dependencies, and feedback loops

Use concepts and techniques from document engineering, data and process modeling, industrial engineering, and software development

Typical artifacts include use cases, process models, class diagrams, XML schemas, queuing and simulation models, and working software

Contrasting Design Goals

- Front Stage Designers
  - Usability
  - Responsiveness
  - Flexibility / Customization / Uniqueness
  - Transparency
  - Enjoyment
- Back Stage Designers
  - Efficiency / Productivity
  - Robustness
  - Standardization / Reuse
  - Scaleability

Tensions and Tradeoffs: Front Stage Perspective

"Those software developers build systems that constrain our ability to deliver the services the customer wants"

"Sure, standards are good... but users have different capabilities and preferences and they need different user interfaces"

"My client wants me to make the SYSTEM more usable... but all I can change is the user interface"

Tensions and Tradeoffs: Back Stage Perspective

"Those interaction designers always propose services that the back end can't support"

"They should just study the service interfaces to the ERP system... can't they all read XML schemas?"

"If every experience has to be different, how can our implementation be robust and scaleable?"

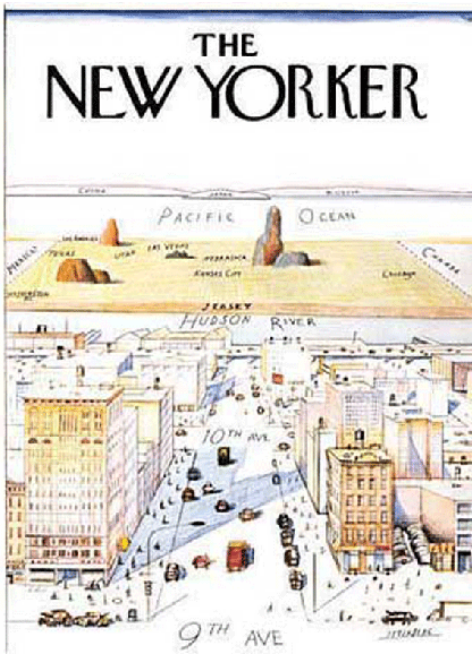
Front Stage, Back Stage, and Point of View

The front stage / back stage distinction designates some actor or service as the focal / primary consumer or customers

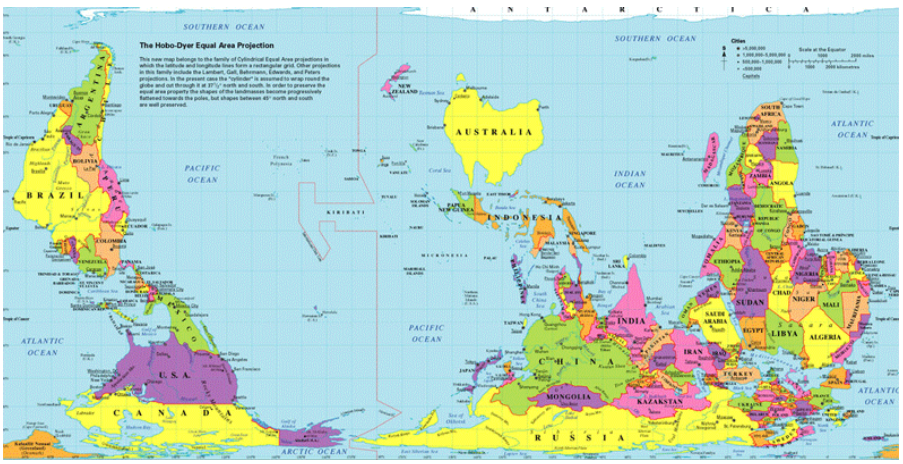
This is typically the end of the value chain or information flow, or where “users” are

But this is often arbitrary, and other actors or stakeholders or services could be alternative POVs

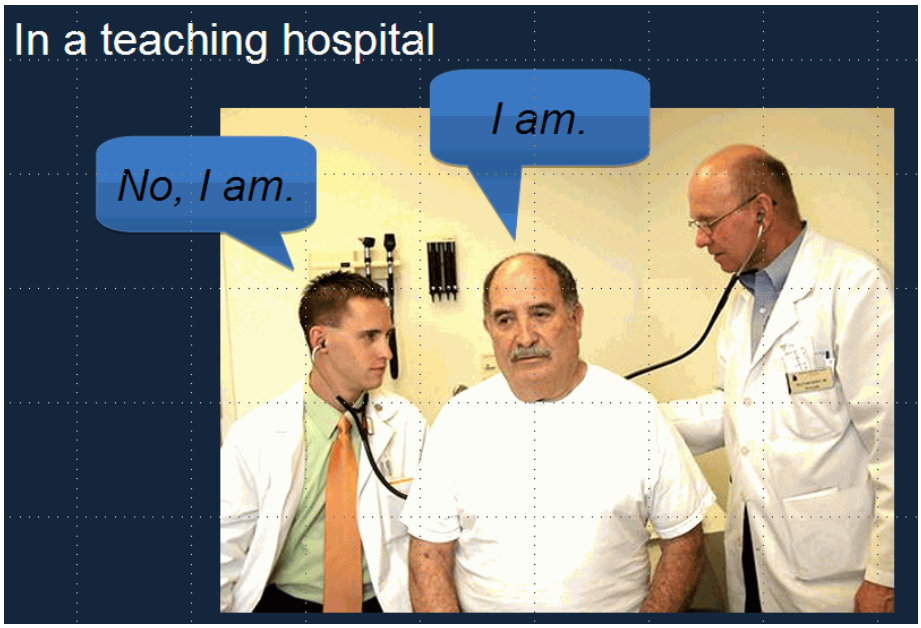
A New Yorker's Map



An Australian's Map

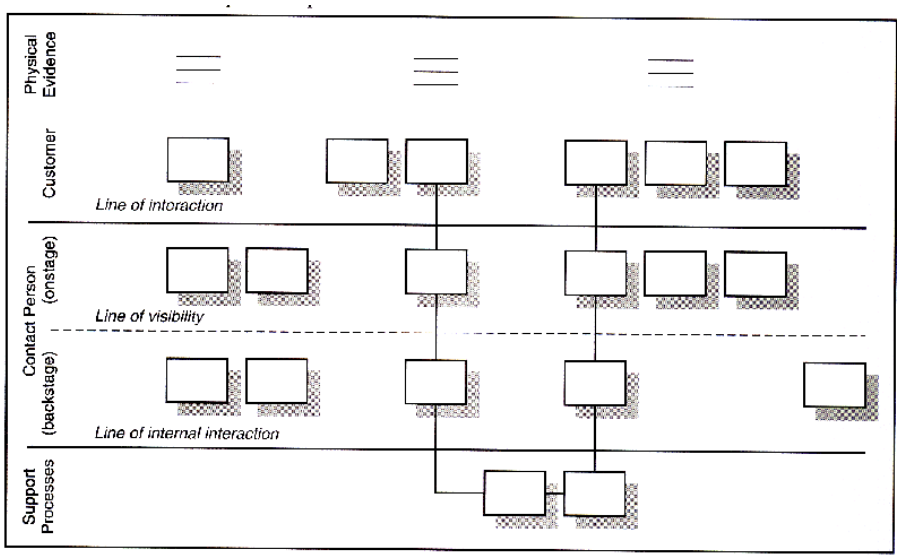


POV in a Teaching Hospital - Who's the Customer?

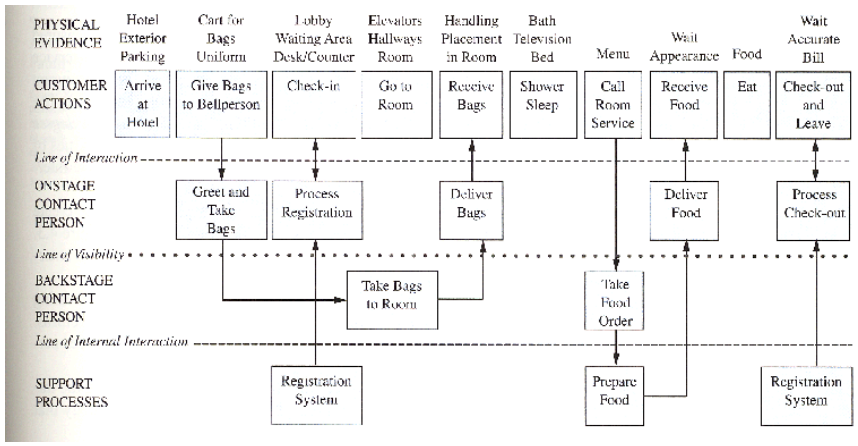


POV in a Cooking School - Who's the Customer?

Service Blueprints - Front and Back Stages of Touchpoints



Service Blueprints - Hotel



Service Intensity and Quality

Chase (1978) proposed a distinction between “low contact” and “high contact” services according to the extent of customer interaction

The notion of service intensity measured according to the number or duration of service encounters seems intuitive and is taken for granted in service experience design

Intensity in this sense is correlated with "attentiveness," "responsiveness," and other characteristics of the interactions between the provider and the customer

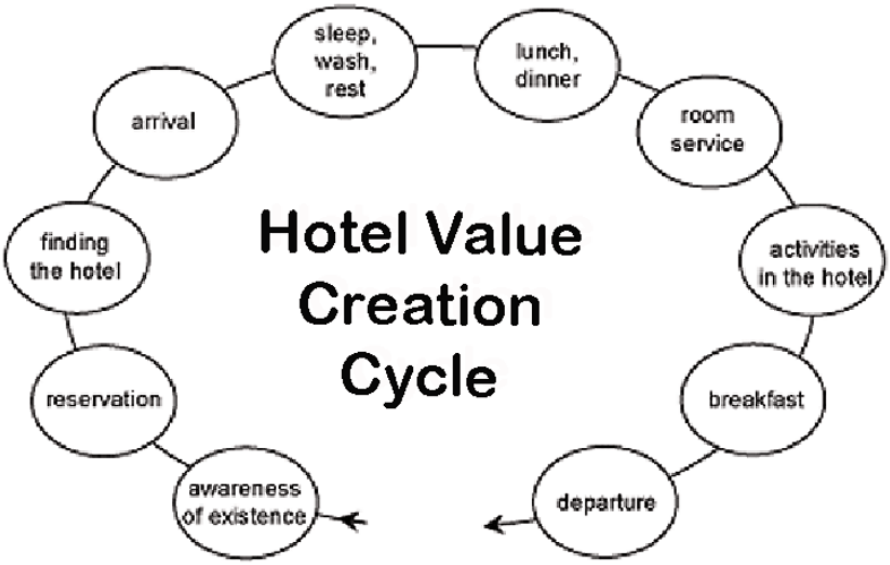
Service Intensity as a Design Pattern

The traditional P2P service design philosophy assumes that customers prefer services with high intensity (the number of actions initiated by the service provider, or the number of touch points)

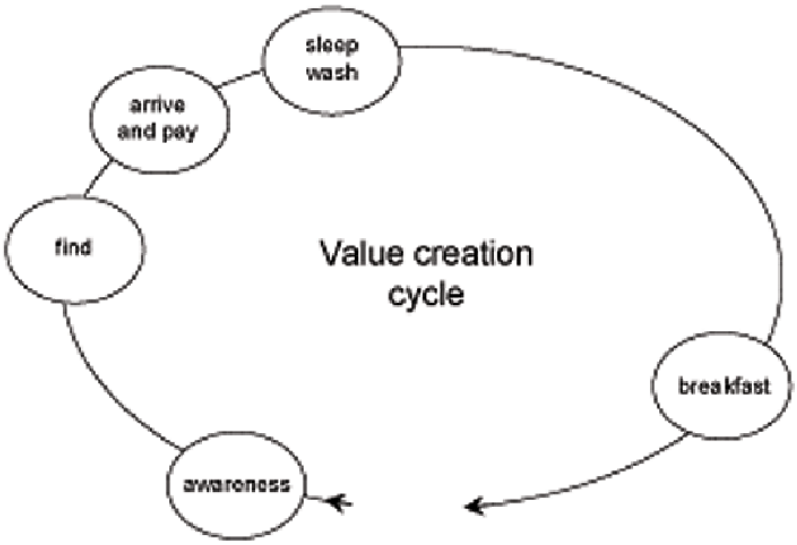
But it is more robust to treat intensity as a design parameter to differentiate service offerings of the same type or industry domain

We can define a "generic" service offering as a design pattern that can be increased or reduced in intensity by changing the number of touch points

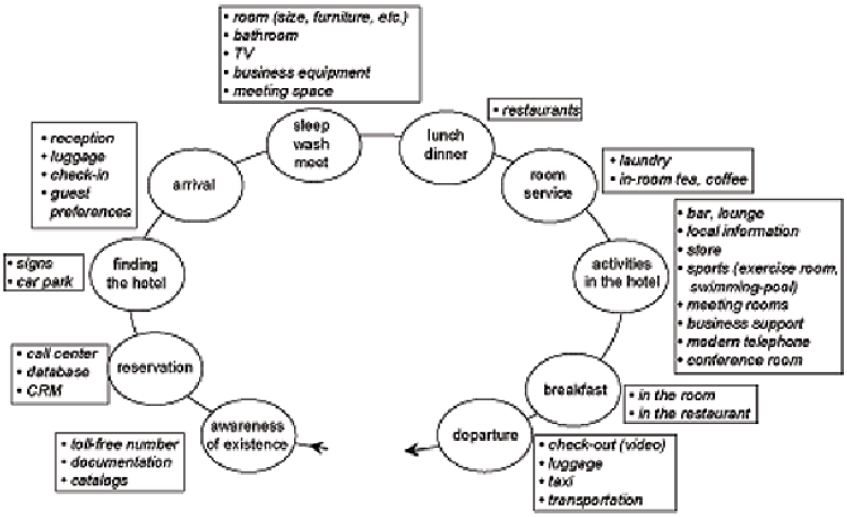
Hotel "Value Creation Cycle"



Budget Hotel "Value Creation Cycle"



Luxury Hotel "Value Creation Cycle"



EXERCISE 1: SERVICE INTENSITY, LOV, & POV AS DESIGN PATTERNS

Describe a service generically in terms of touch points or encounters like the "generic" hotel service (be careful about the point of view; more than one might be possible)

Design a "simple" or "low intensity" service by eliminating some touch points or moving them to the back stage behind the "Line of Visibility"

Design an "enhanced" or "high intensity" service by adding some touch points or moving what had been implicit back stage ones in the generic service to the front stage

Discussion Points for Exercise 1

In businesses with complex services (hospitals, airlines, hotels...) there may be dozens of potential touch points or service encounters

The service provider needs to distinguish between the simple or minor touch points that don't have the potential for creating a "value-creating" bond with the customer and those that do

Some services and touch points 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

"Substituting Information for Interaction" as a Design Pattern

Capturing, managing, integrating and retrieving information allows service providers to substitute information for interaction

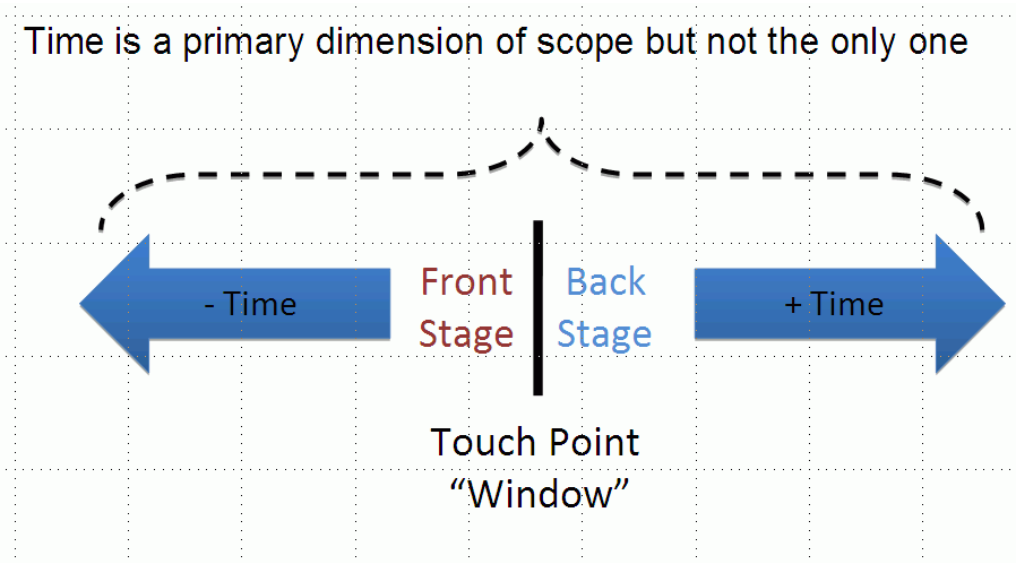
You don’t need high intensity or many touch points if stored information makes interaction unnecessary

A hotel clerk with a database doesn’t need to ask for your room preferences; Amazon doesn’t need to ask you about what type of books you like

Design implication: hidden computational services are interchangeable with customer-facing “touch points”

The "Touchpoint Window" as a Design Pattern

Service providers can also distinguish themselves by extending the scope or duration of the experience; the scope extends before and after the "core" touch points to an extent that is itself an important design decision



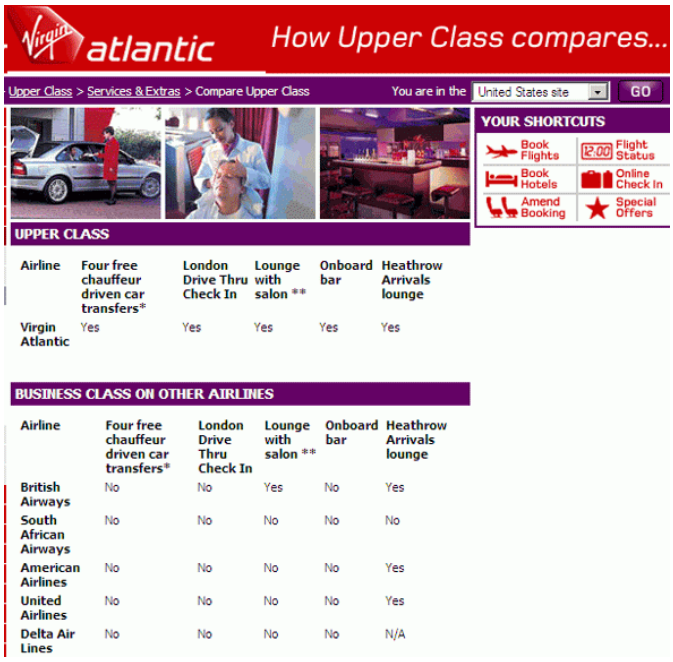
Service Journey - Airline Travel

When does an "airline travel" experience begin from the customer's point of view?

When does an "airline travel" experience begin from the airline's point of view?

What are the consequences if the customer's starting and ending points for the service journey are earlier and later than the airline's?

The Virgin "Upper Class" Experience



How Upper Class compares...

Upper Class > Services & Extras > Compare Upper Class

You are in the United States site GO

YOUR SHORTCUTS

Book Flights | Flight Status | Book Hotels | Online Check In | Amend Booking | Special Offers

UPPER CLASS

Airline	Four free chauffeur driven car transfers*	London Drive Thru Check In	Lounge with salon **	Onboard bar	Heathrow Arrivals lounge
Virgin Atlantic	Yes	Yes	Yes	Yes	Yes

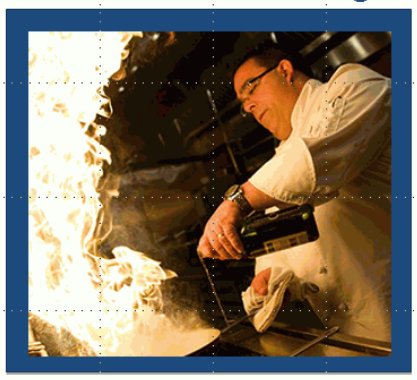
BUSINESS CLASS ON OTHER AIRLINES

Airline	Four free chauffeur driven car transfers*	London Drive Thru Check In	Lounge with salon **	Onboard bar	Heathrow Arrivals lounge
British Airways	No	No	Yes	No	Yes
South African Airways	No	No	No	No	No
American Airlines	No	No	No	No	Yes
United Airlines	No	No	No	No	Yes
Delta Air Lines	No	No	No	No	N/A

The Touchpoint Window - Gourmet Restaurant

Front Stage

Back Stage



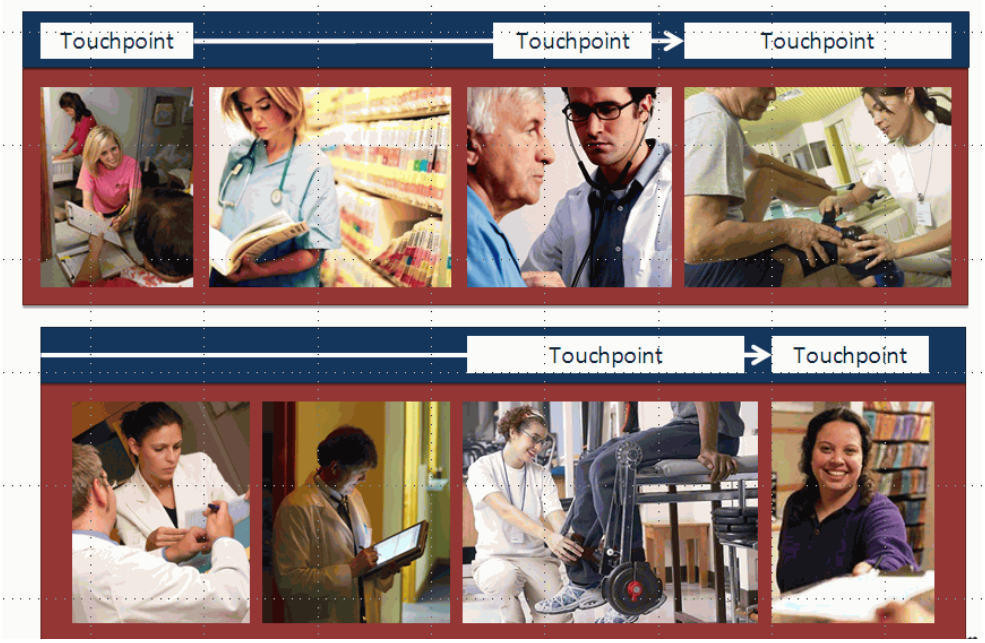
A “customer-oriented” perspective on a gourmet restaurant suggests a narrow service system scope

The Touchpoint Window - "Locavore" Restaurant

But it might be essential to extend the design scope to ensure the desired experience in the "touchpoint window"

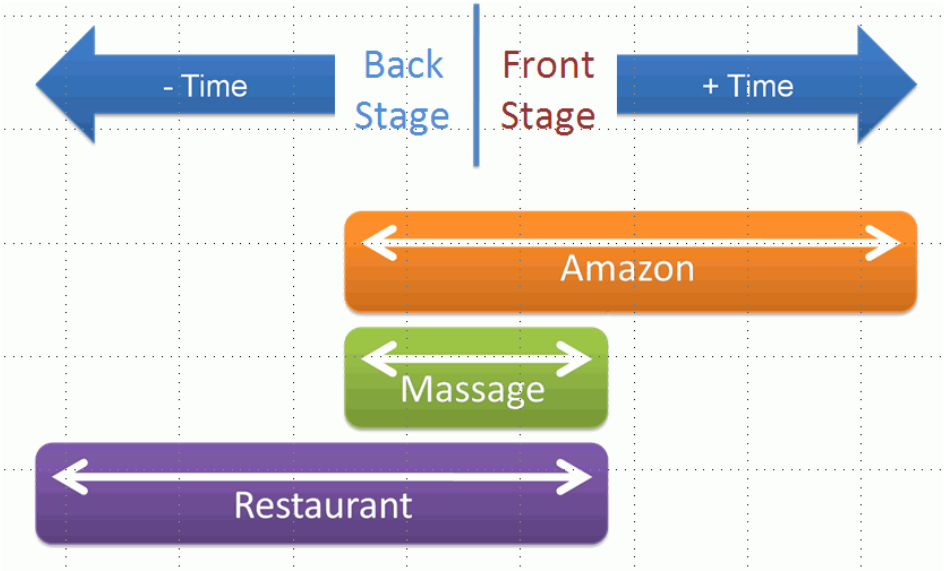
The Touchpoint Window - Massage

The Touchpoint Window - Physical Therapy



The Touchpoint Window - Drop Shipment

The Touchpoint Window - Scope Comparisons



An Abstract View of Services and Service Encounters

The service design and innovation process you just followed is easier to do if we take a more abstract view of services and service encounters

- There are service providers and service consumers… but these are roles, not intrinsic properties
- A service provider (role) has an interface through which the service consumer (role) interacts to request or obtain the service
- Value or quality is created/co-created by the interactions and information interchanges between the provider and consumer
- Because many of these interactions and information exchanges reflect or result from "back stage" services, the service encounter can't fully determine quality, only preserve or reveal it

Business Components and "Service Oriented Architecture"

So we need to think of "what a business does" in more granular terms

Business functions or services are "components"

A business model or service system is a composition or assembly of components

These business components can be a mix of core, internal ones that a business does itself and outsourced ones provided by other businesses

Modeling a Business or Service System as a Set of Components

Business processes are typically "factored" into components according to the "best practice" patterns in each industry

An emphasis on business model / business process / information exchange patterns facilities component reuse / reassembly into new combinations - virtual enterprise, composite services

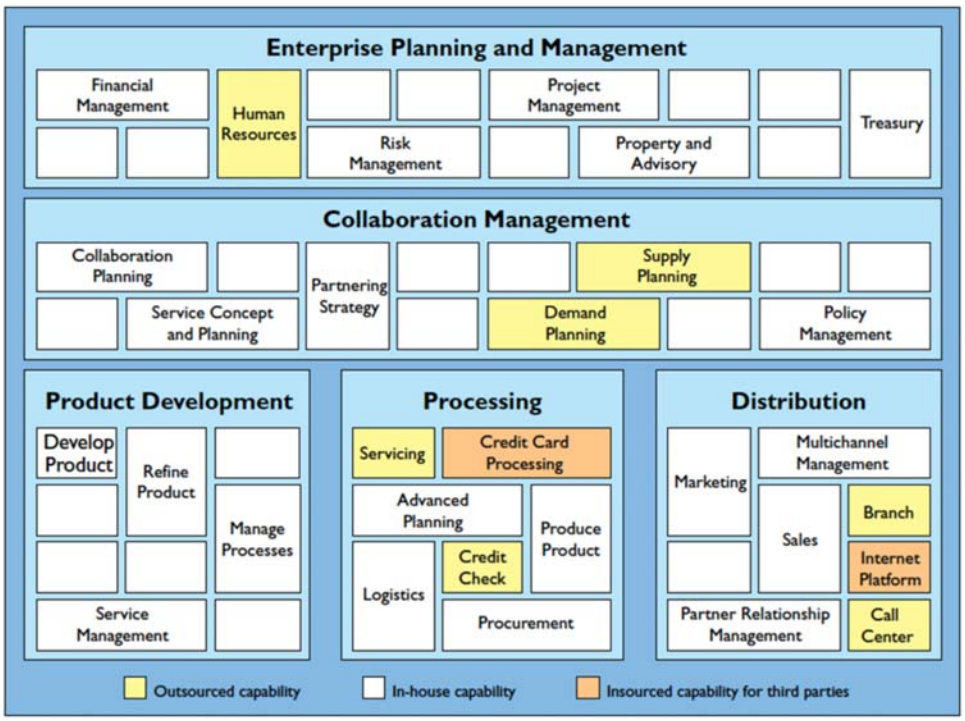
"What components do" is defined in abstract, technology-independent terms so we don't have to care about the computer, operating system, or software application that performs each business process

This level of abstraction reduces integration and communication costs between components and is the essence of service orientation

Component Business Map -- Generic

	Business Administration	New Business Development	Relationship Management	Servicing and Sales	Product Fulfillment	Financial Control and Accounting
Directing	Business Planning	Sector Planning	Account Planning	Sales Planning	Fulfillment Planning	Portfolio Planning
Controlling	Business Unit Tracking	Sector Management	Relationship Management	Sales Management	Fulfillment Planning	Compliance
	Staff Appraisals	Product Management	Credit Assessment			Reconciliation
Executing	Staff Administration	Product Directory	Credit Administration	Sales	Product Fulfillment	Customer Accounts
		Marketing Campaigns		Customer Dialog		
	Production Administration			Contact Routing	Document Management	General Ledger

Componentized Bank

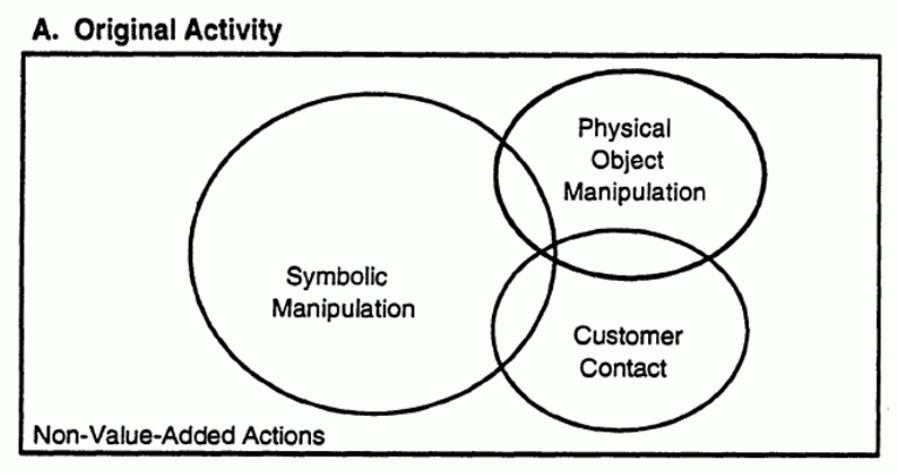


Apte & Mason -- Patterns for Service "Disaggregation"

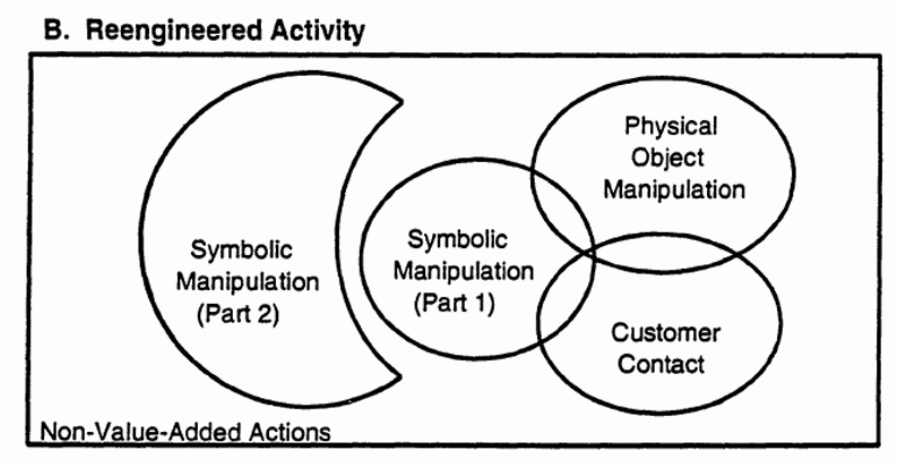
Business models / occupations can be characterized by their intensity on three dimensions

Occupation	Information Intensity	Customer Contact Need	Physical Presence Need
Actuary	H	L	L
Marketing Manager	H	M	L
Civil Engineer	H	L	M
Comm. Eqpt. Operator	M	L	L
Cleaning	L	L	H
Food Service Manager	L	H	H
Secretary	M	H	H
Registered Nurse	H	H	H

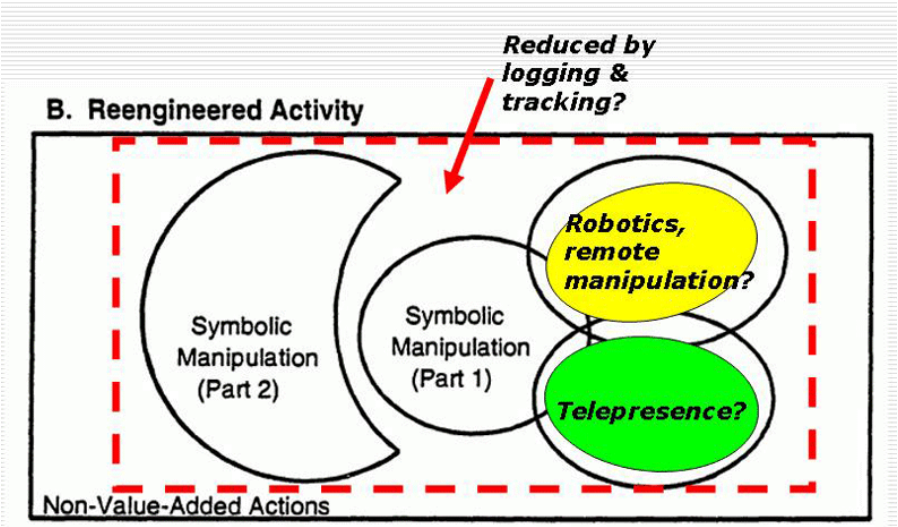
Apte & Mason - Before Disaggregation



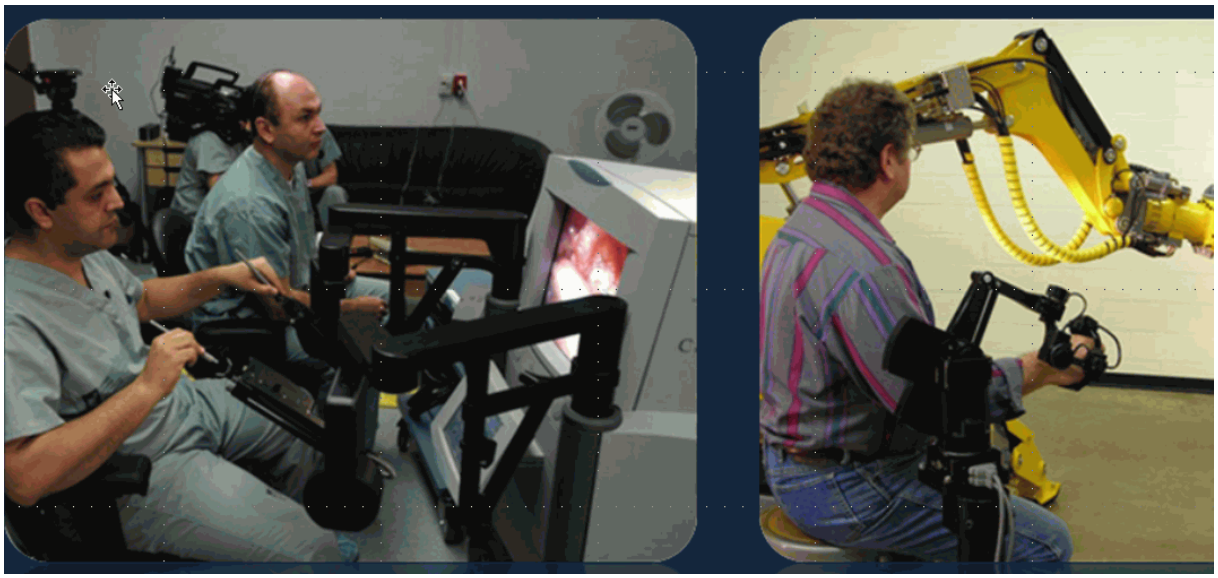
Apte & Mason -- After Disaggregation



Underestimating the Impact of Technology?



Telerobotics



Telepresence

Betancourt and Gautschi - Patterns of Economic Activity

Production, Distribution, and Consumption are the three economic activities

What are their spatial relationships? What are their temporal relationships? nominally 25 possibilities

How does technology change the feasible combinations?

How does technology change the preferred combinations?

Time	{P, D, C}	D | {P, C}	C | {P, D}	P | {C, D}	P | D | C
Space					
{P, D, C}	1	2	3	4	5
D | {P, C}	6	7	8	9	10
C | {P, D}	11	12	13	14	15
P | {C, D}	16	17	18	19	20
P | D | C	21	22	23	24	25

EXERCISE 2: AGGREGATION / DISAGGREGATION AS DESIGN PATTERNS

Deconstruct an existing service system into the three phases of production, distribution and consumption and locate this combination in one of the 25 cells in the Betancourt and Gautschi framework (retailing? education? ...)

Analyze other cells in the B & G framework, especially those that are near the "as is" service, and assess their feasibility or desirability

Identify the changes in the service concept and value proposition that would be required for the service to be offered in one of these new configurations

(If you have time... consider the possibility of extending the "touchpoint window" before and after the "as is" service or for one of the new configurations. What services would be added to the service system. How would the overall value proposition change?)

Discussion Points for Exercise 2

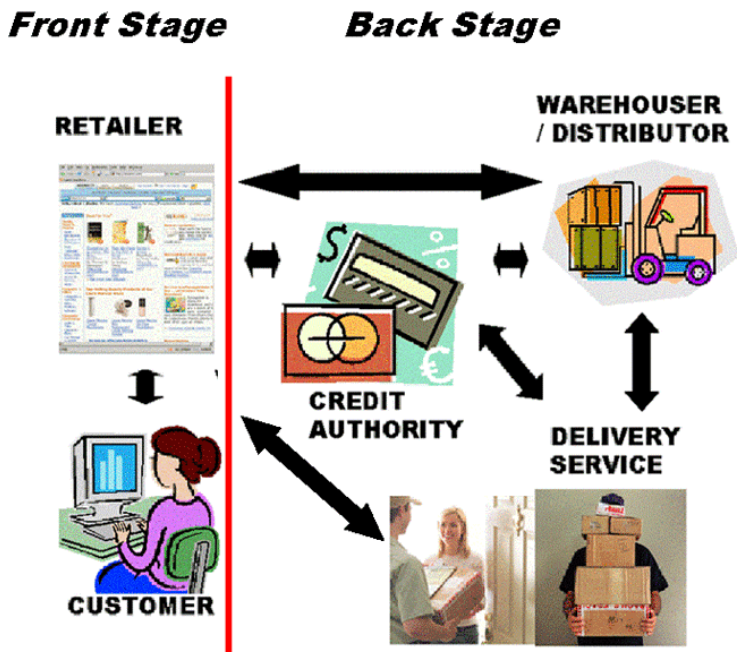
What services did you deconstruct into the B & G framework?

Are some "as-is" configurations of production, distribution, and consumption more common or natural than others?

Are some new configurations of production, distribution, and consumption more feasible or desirable than others? Why?

Retailing in Betancourt & Gautschi #1

Retailing in B & G #25: Drop Shipment Pattern



Motivating "Seven Contexts" as a Design Pattern

We've now seen several design patterns for service system design and innovation

In "Seven Contexts for Service System Design" I try to bring them together into a common framework

The design patterns facilitate a perspective in which service systems can be analyzed as configurations of design contexts, each with characteristic design issues and methods

Derivational and compositional relationships among the contexts define design patterns for innovation and evolution of service systems

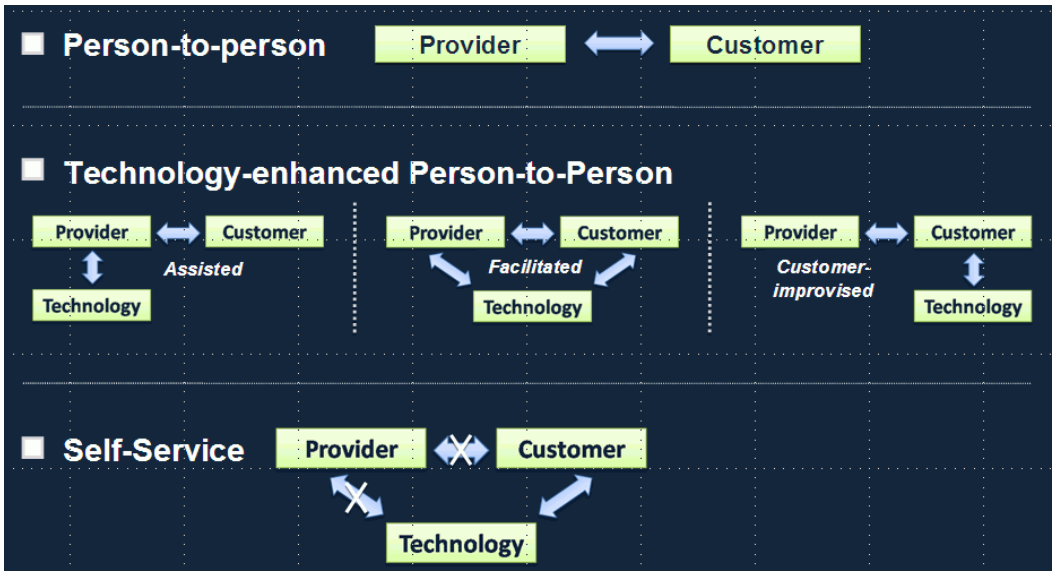
The Seven Contexts

Contexts as Building Blocks

Describing and designing service systems in terms of the seven contexts makes it much easier to consider alternative service system designs:

- replacing or augmenting a person-to-person service with self-service
- substituting one service provider for another in the same role (e.g, through outsourcing)
- eliminating a person-to-person interaction with automation or stored information

P2P, Technology-enhanced P2P, and Self-Service Contexts define a Continuum



"Flavors" of Technology Enhancement

"Assisted" encounters - technology used by the "frontline" provider to enhance capabilities

"Facilitated" encounters - technology used jointly by provider and customer

"Customer-improvised" - technology introduced by customer and not expected by provider

Too Much Self-Service?

Multichannel Context

Stores with both physical and web presence (mostly for tangible goods)

In-store kiosks or self-service terminals

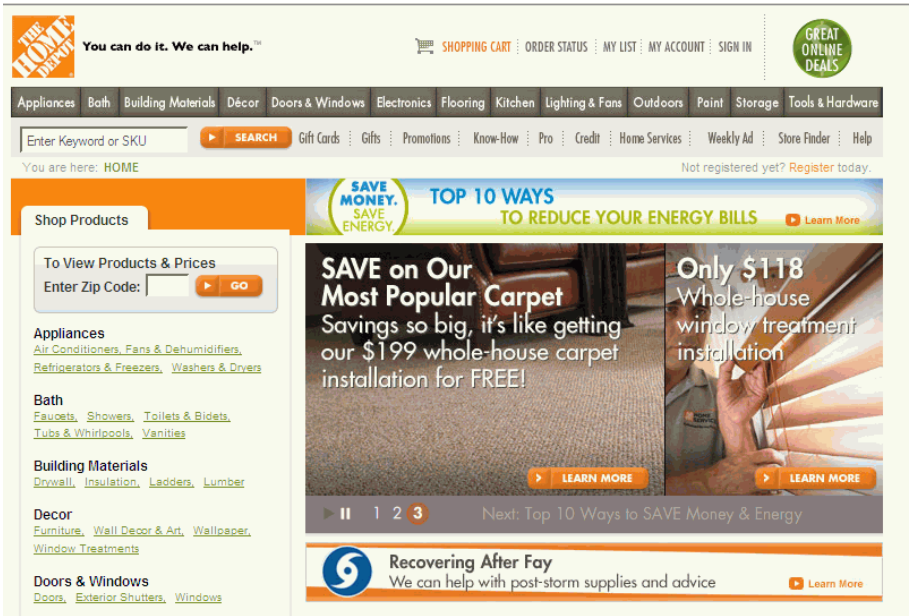
Firms that use downloadable store coupons, RSS, Twitter, or email to inform and make offers to customers

Online stores that provide inventory information for local stores to enable online purchase with local pick-up

Government agencies that provide web options for face to face service transactions like DMV

Home Depot - Physical Store

Home Depot - Online Store



"Embedded" Online Retailer

Gas Station TV

Design Issues for Multichannel Services [1]

What are the (actual or potential) benefits of multichannel services for providers?

How much technical integration is possible/desirable?

How much business integration is possible/desirable?

Design Issues for Multichannel Services [2]

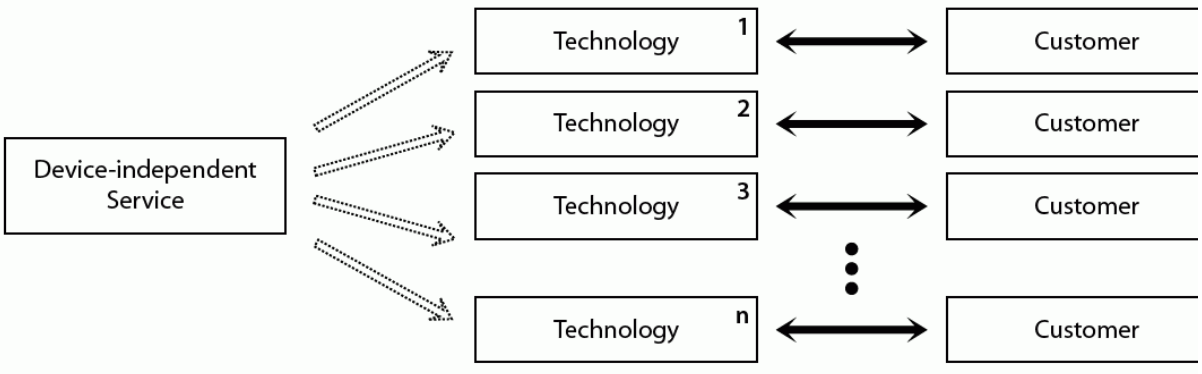
What are the (actual or potential) benefits of multichannel services for customers?

What do customers expect or understand about the "user experience" in multichannel environments?

What are the implications for technical and business integration?

Multiple Devices / Platforms Proliferation

Designing for Multiple Devices / Platforms



Multi-platform Services

Why do some applications or services need to run on multiple platforms?

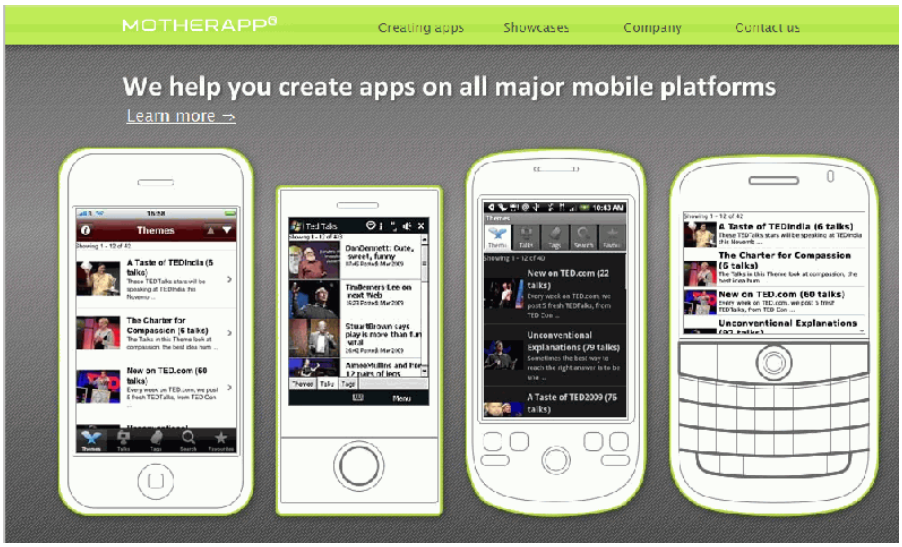
How can user interfaces be developed for multiple platforms? What are the costs and benefits of separate designs for each one vs a "design once and adapt" approach?

Can We Achieve Consistency or Continuity of User Experience?

"Users expect to be able to reuse their knowledge of a given version of the system when using the same service on another platform"

Alternatively, if "capabilities vary so greatly...it makes sense for users to expect varying functionality on the different devices"

"Mother App" for Smart Phones



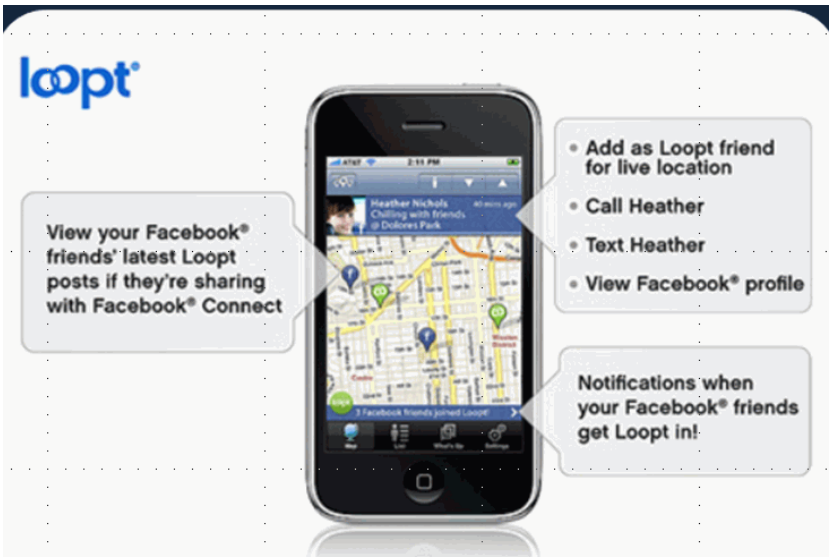
No Mother is Possible

Location-based / Context-aware Services

No need for service consumer to provide location and context information that the service provider has already obtained from sensors

No need for service provider to give information to consumer that isn't relevant to his location and context

Location Based Service



Augmented Reality Application

Context Attributes

Location is the most obvious context attribute, but if context is "any information that characterizes a situation related to the interactions between users, applications, and the surrounding environment" context is very open-ended

Many technologies for sensing context information can make devices and services "smart"

New "Smart Service" Concepts with "Connected Devices"

"Virtually any product that uses electricity -- toys, coffeemakers, cars, medical diagnostic machines -- possesses inherent data processing capabilities. Each has a wealth of information about its current status, usage history, and performance"

Remote monitoring (of environments or products)

Vendor-managed inventory ("remote monitoring" of retail shelf space)

Monitoring + capability upgrading

Location information as a service

Remote monitoring + Location Information

Remote monitoring + Interactive control

Otis Remote Elevator Monitoring

A Diagnostic software monitors elevators continuously and sends data to the REM unit located in the machine room.

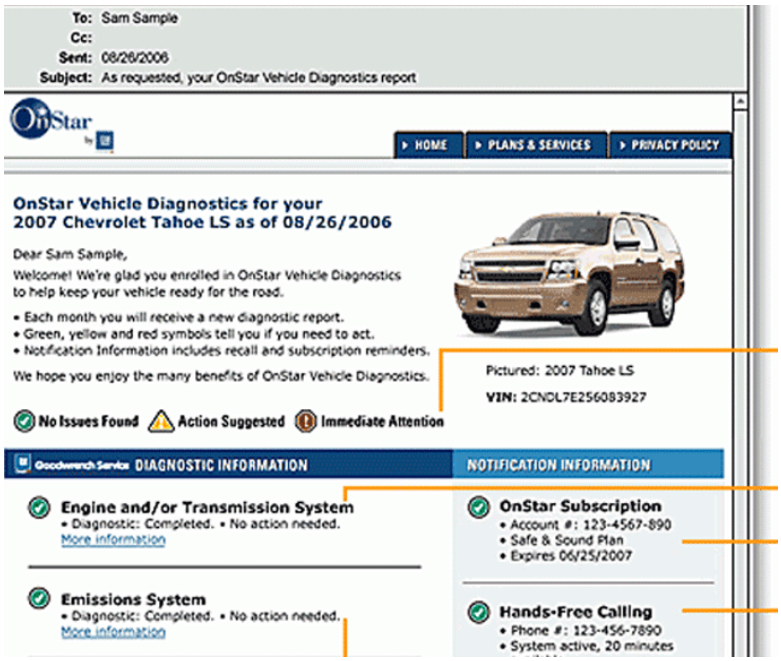
B The REM unit sends this information to the OTISLINE center.

C Data is categorized by urgency and reviewed by OTISLINE representatives.

D An OTISLINE representative alerts the field mechanic, if necessary.

E The mechanic arrives at the job site with specific information, tools and parts to work on the elevator.

GM Onstar (onstar.com)



"Back-stage Intensive" or "Computational" Context

Many enterprise applications, transactional systems, or devices generate information that is not usually exposed in customer-facing interfaces

Many of these back-stage services involve information exchanges or computations with no human involvement

Providers and consumers interact by exchanging information through “service interfaces” that specify the inputs and outputs of each service

Transparent Subsitutability

Providers and consumers interact by exchanging information through “service interfaces” that specify the inputs and outputs of each service

These interfaces are implicit in P2P encounters, but always explicit for non-human actors in computational service contexts

In the purest vision of “service oriented architecture,” the interfaces are abstract, enabling transparent substitution of one provider for another to optimize service quality for each consumer

"Transparent Substitution" in Shipping Service

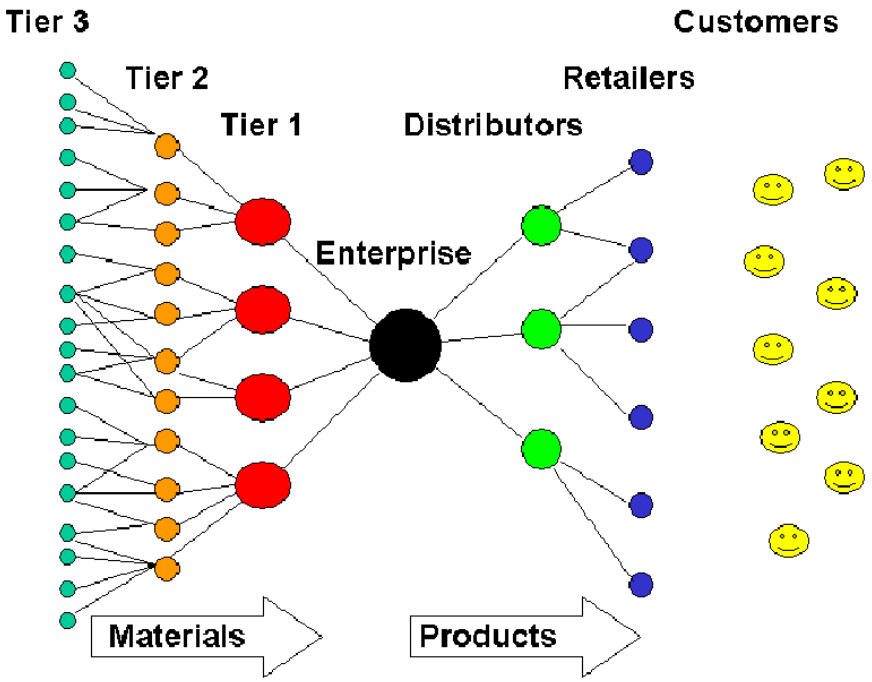
The Supply Chain Pattern

A supply chain is an aggregated and end-to-end view of the buy-side and sell-side relationships of an enterprise

A supply chain is the network of facilities and distribution capabilities an enterprise uses to:

- "Source" (or "procure") raw materials (chemicals, ores, grains, ...) or components
- Transform the materials or assemble the components into products
- Deliver the products to customers (indirectly through distributors or stores or directly to the purchaser)

Supply Chain - Conceptual Model



The Information Supply Chain

The flow of materials and goods in a supply chain is accompanied by information about it

But information about supply chain activities and processes is increasingly separated from the physical flow of materials and goods, and for information-based services there is no physical stuff

Information also flows in the opposite direction from the customer, retailers, and distributors back into the supply chain – this is also called the DEMAND CHAIN

The information supply chain has become especially important because increased global competition and better informed customers are forcing forms to shift from forecast to demand (i.e. customer) driven business models

Design Issues for the Information Supply Chain

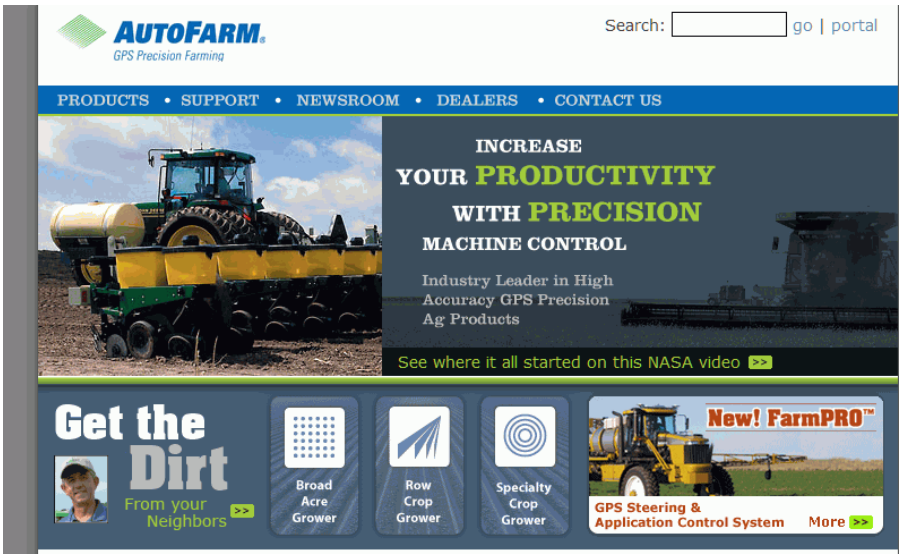
What information is exchanged?

Which entities in the supply chain are able to exchange information?

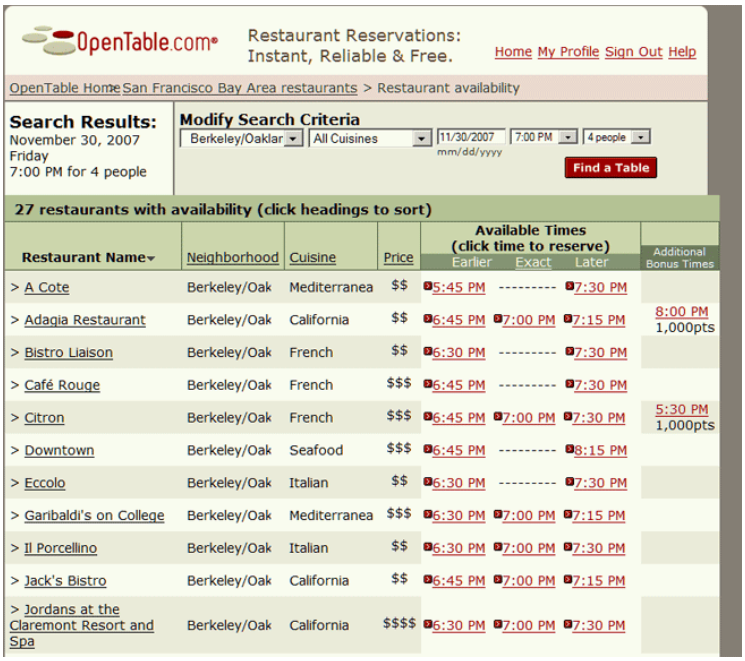
What is the frequency of this information exchange?

Scanning RFID Tags on Vegetable Boxes

GPS Farming



Open Table Availability



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	

A "Seven Contexts" Design Example

ISchool Project - students acting as consultants to bookstore chain

Successfully designed-in all seven contexts

"Core" services can provide value to multiple stakeholders in different functions

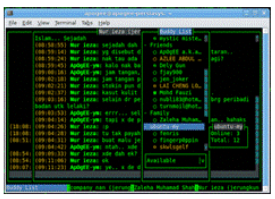
"Smart Bookstore" [1]

Customer browses "Bookland" bookstore site, looks at several books but doesn't purchase them

While walking in town a few days later, text message alert on mobile phone tells him he is near a Bookland store, offering him a discount on the books he browsed online that are in stock at that store

Customer identifies himself with RFID-enabled loyalty card at self-service kiosk, gets printed store map with book locations highlighted

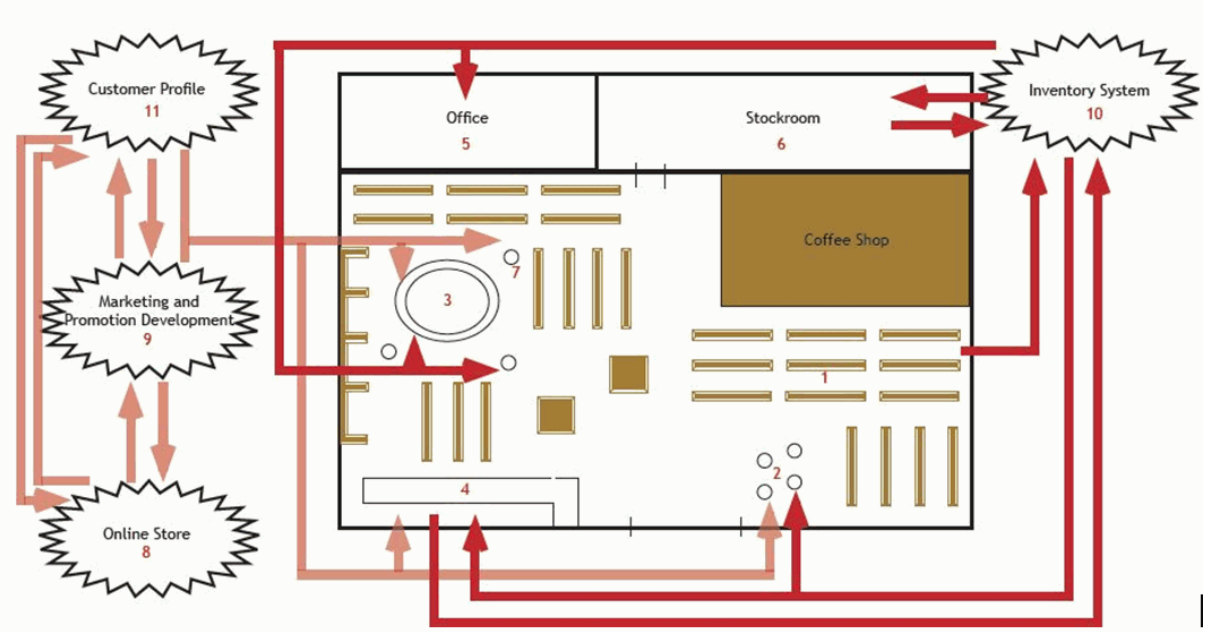
"Smart Bookstore" [2]



His purchases update his customer profile and store inventory, triggering new recommendations and reordering

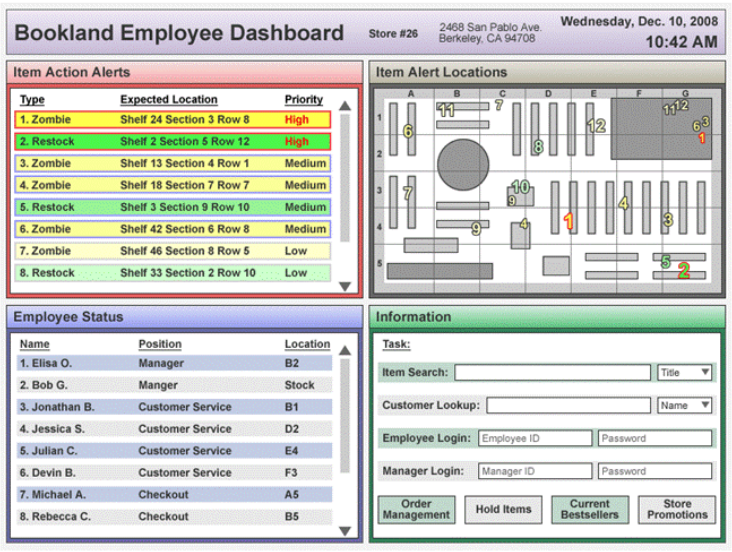
Books that are removed from shelves but left in coffee shop, rest room, etc. are "zombies" that are detected by RFID tracking, with alerts sent to employee dashboard

Information Flow in "Bookland"



Customer Self-Service Interface

Employee Dashboard



EXERCISE 3: SEVEN CONTEXTS DESIGN PATTERNS

Analyze an existing service system using the Seven Contexts design pattern

If the service system doesn't involve all seven contexts, consider incorporating those that are missing

What new value would these new contexts provide in the service system?

What information from the new contexts could be exploited in the existing contexts?

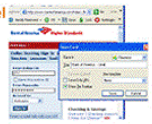
Retail Banking - Seven Contexts

(1) Pure P2P
Private banking / VIP financial advisory service

(2) Tech-enhanced P2P
Tellers at bank windows

(3) Self-service
ATM

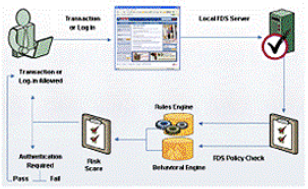
(4) Multi-channel
Online banking



(5) Multi-device
Mobile banking

(6) Back stage / computational
Wire transfer

(7) LBS / Context-aware service
Fraud detection / alert
(If card usage is abnormal such as overseas, alert is sent to customer and bank.)



Summary: Today's Big Ideas

Design patterns have a central place in engineering, architecture and computing but haven't been a focus of service system design

The more abstract conception of services and service interfaces embodied in design patterns assists in analysis, encourages best practice, and facilitates innovation

These design patterns can be taught to and used successfully by university students and practitioners

For More Information

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Glushko, R.J. Seven Contexts for Service System Design. In Maglio, P. P., Kieliszewski, C, & Spohrer, J., Handbook of Service Science, (2010)

Glushko, R.J and Tabas, L. Designing Service Systems by Bridging the “Front Stage” and “Back Stage.” Information Systems and E-Business Management, (2009).

Glushko, R.J. and McGrath, T. Document Engineering: Analyzing and Designing Documents for Business Informatics and Web Services. (2005)

Glushko, R.J. Information System and Service Design:Strategy, Models, and Methods. Graduate course taught at University of California, Berkeley (http://www.ischool.berkeley.edu/courses/228)