Bay Area SSME Lecture Series – 12 November 2009

SEVEN CONTEXTS

for designing service systems

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Information & Service Design Program

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Agenda

- The Definition of “Service”
- The Definition of “Service System”
- Seven Contexts with Characteristic Design Issues and Methods
- Contexts as Building Blocks of Service Systems
- Service System Scope, Intersection and the Future of Service System Design

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What is a Service?

- A computational / technological unit of functionality with hidden implementation
- Requests and responds through well-defined interfaces defined using XML
- Conforms to standards and design principles (WS*, REST, …)
- Composed / choreographed / orchestrated / mashed-up to yield more complex functionality
- Designed with concern for reliability, scaleability, robustness, interoperability…

Examples of Services

- Amazon and Google APIs
- ebXML and UBL business process interfaces in B2B
- Information from devices or sensors

What is a Service?

- The process of using one's resources or competencies for the benefit of another person
- Interpersonal interactions to co-operatively create value
- Vary from "high-contact" to "low-contact" depending on need for empathic or personalized interactions

Examples of Services

- Accommodations and food services
- Arts, entertainment, recreation
- Personal services characterized by high empathic or physical interactions
- Professional and information-intensive services characterized by high degree of information processing and exchange

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Examples of Services

Personal Service

Self-Service

Web Service

If these are all “services,” are there any design concepts and methods apply to all of them?

Motivating a new concept of Service

- What services are involved when you check into a hotel?
- What determines the quality of your hotel check-in experience?

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Hotel Check-In

Making the Reservation

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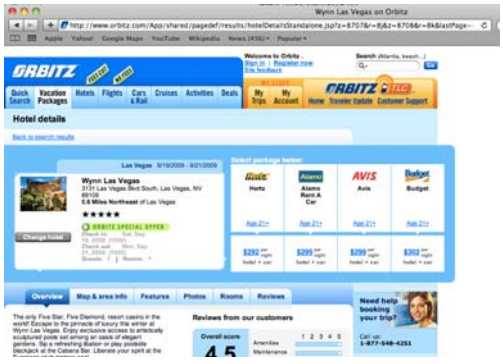
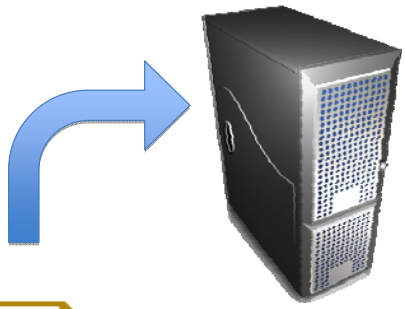
Hotel Check-In

Back-end B2B





Hotel Reservation System

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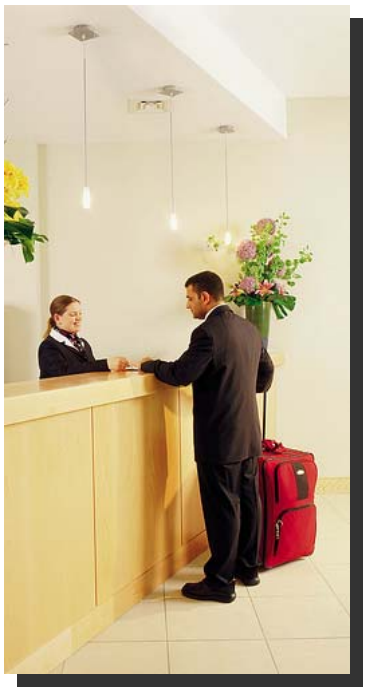
Hotel Check-In



Hotel
Employee to
Customer

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Hotel Check-In

Looking up the
Reservation

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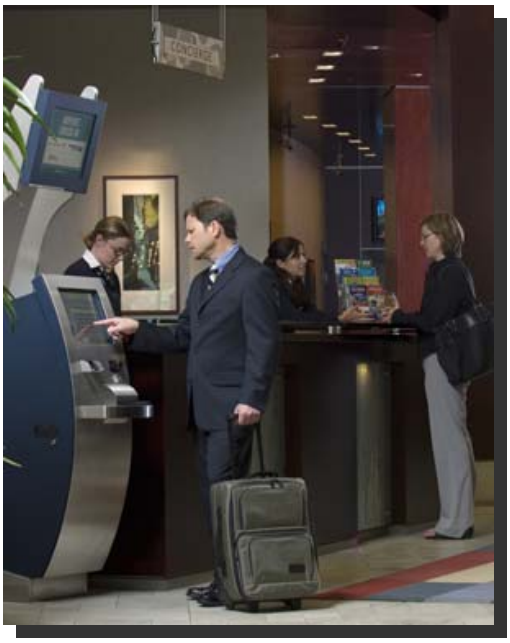
Hotel Check-In



Self-Service

Key Observations and Questions

- The quality of the hotel check-in experience is ***not determined by*** the service encounter – it is ***revealed*** and ***preserved*** there
- ***Quality is a composite or system property*** of all the services that contributed to the service encounter
- Do we focus on how these services and service encounters differ?
- Or do we emphasize what they have in common?

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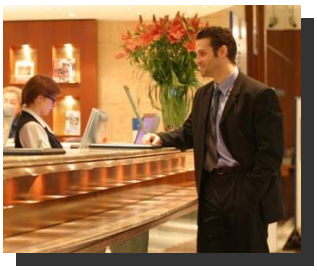
What is a Service?

- There are service providers and service consumers… but these are roles, not intrinsic properties… and they can be performed by human or computational agents
- 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

The Hotel Check-in "Service System"

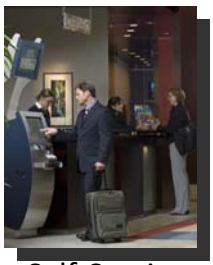
Hotel Website



Check-in Counter

Travel Website
(Orbitz, etc)

Hotel Reservation System



Self-Service

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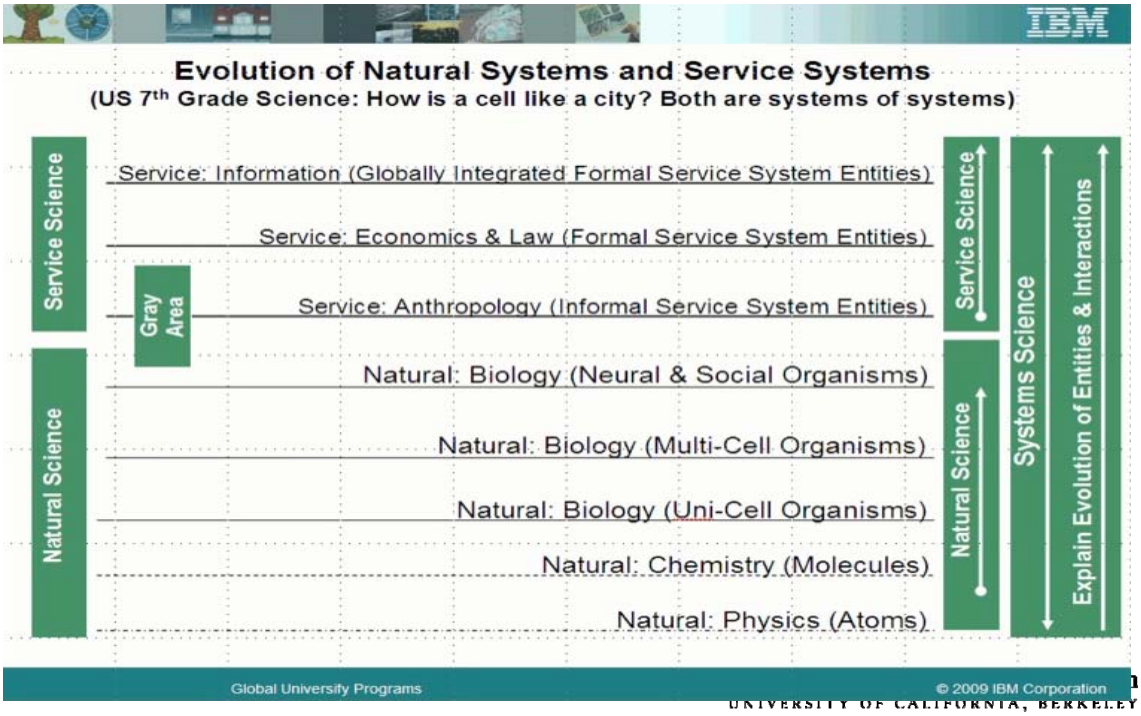
From “Service” to “Service Systems”

- A Unifying Concept
  Treating services more abstractly lets us see the SERVICE SYSTEM as the appropriate framework for understanding how services work
- An Expansive and Recursive Definition
  “Value co-creation configurations of people, technology, and value propositions that interconnect service systems, and shared information” (Maglio et al 2006)
- Comprehensive
  Can include everything from person-to-person encounters to the global economy

Evolution of Natural Systems and Service Systems

(US 7th Grade Science: How is a cell like a city? Both are systems of systems)



Designing Information-Intensive Service Systems

- But the concept of “Service System” is so abstract and recursive it describes almost everything!
- We need to narrow the scope and ***simplify the description of service systems*** to be able to provide ***prescriptive design guidance*** and teach service system design
- Narrowing the scope to “information-intensive” service systems and constraining the descriptive vocabulary as “building blocks” gives us exactly that

Service Design Contexts

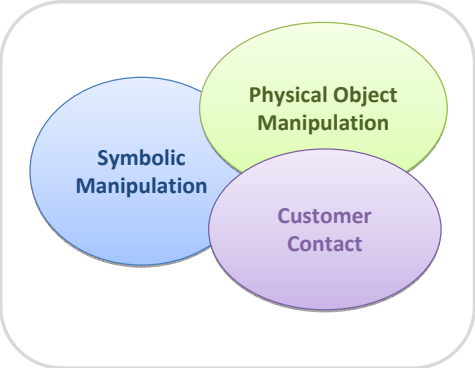
Service Design Contexts

- A framework for designing service systems from “building blocks”
- Each context has characteristic design concerns and methods
- Derivational and compositional relationships among the contexts define design patterns
- These patterns enable the incremental design of service systems

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

Deconstructing Service Encounters

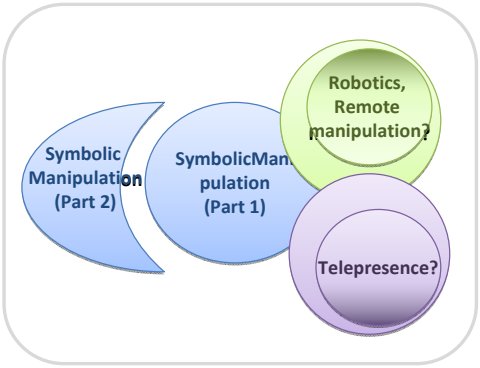


Service encounters can include:

- Interpersonal Interaction
- Physical Interactions
- Information Processing & Exchange

Apte, U. and Mason, R. Global Disaggregation of Information-Intensive Services. *Management Science* (1995)..

Deconstructing Service Encounters



Technology changes these proportions…

- Information can augment interpersonal and physical interactions
- And can also replace them

…and enables scaleable and reliable service personalization

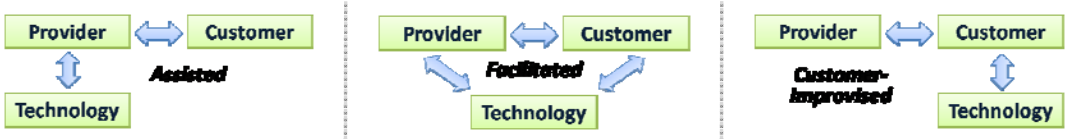
Telepresence&Telerobotics



The Continuum

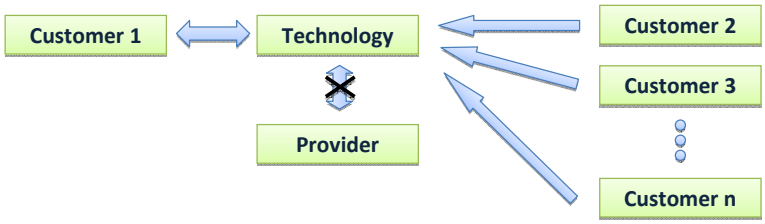
Person-to-person

Technology-enhanced Person-to-Person



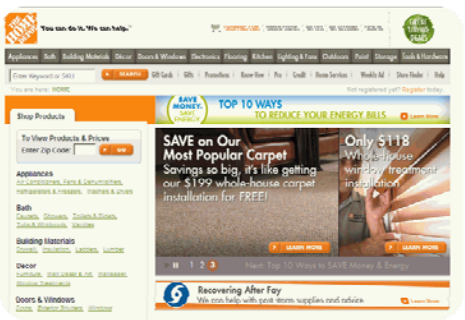
Self-Service

Customer-to-Customer "Crowdsourcing"



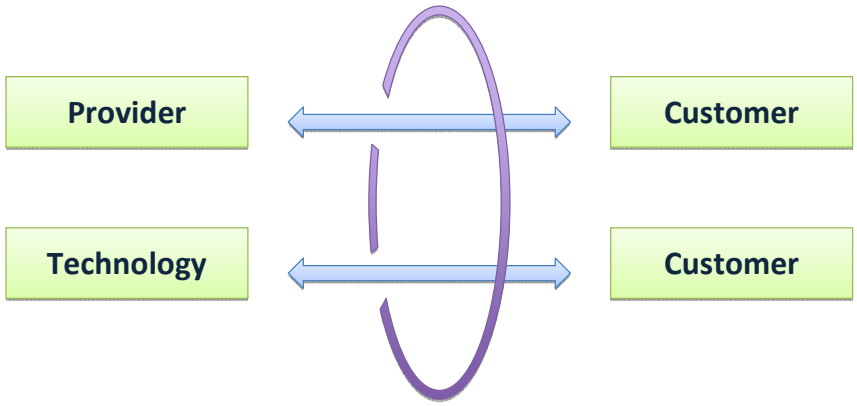
- An emerging extension to the self-service context is "crowdsourcing" or "community content"
- Service customers provide preferences or other content implicitly through use or explicitly by rating or "tagging" service offerings or information
- This information exchange between customers enhances future service to themselves or others

The Multi-Channel Context



- Combines P2P and Self-Service Contexts
- **Key Design Questions:**
  Content, direction, and reciprocity of information exchange between channels

The Multi-Channel Context



Multi-Channel Service Systems

•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

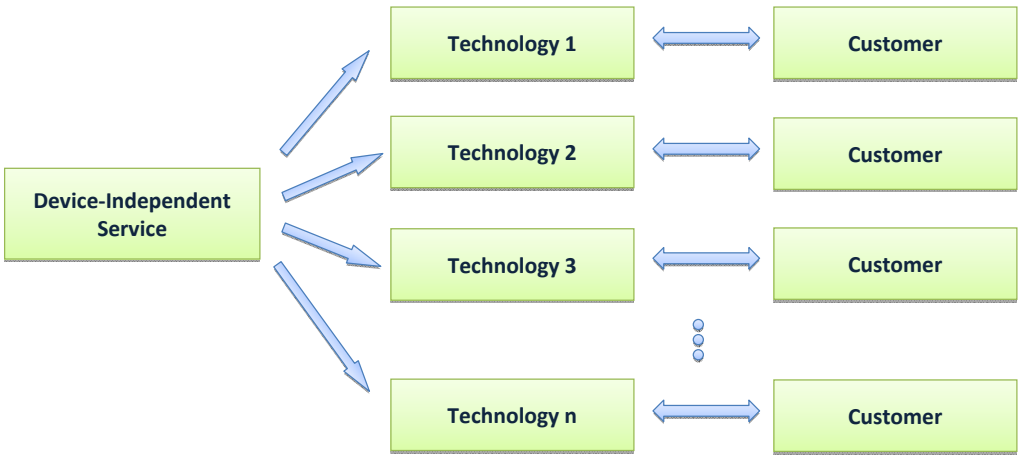
• Online stores that provide inventory information for local stores to enable online purchase with local pick-up

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

The Multi-Device Context

- Extends the self-service context (the same service) to multiple devices or platforms
- **Key Design Questions:**
  Consistency and predictability of functionality, content, and user interface between channels

The Multi-Device Context



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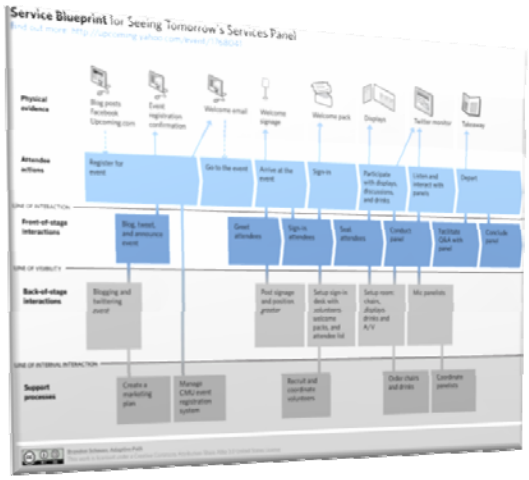
Service Design Patterns



- Adjusting the absolute and relative amount of interpersonal, physical and informational interaction
- Adjusting the line of visibility between the front and back stages
- The number of “touch points” or “stored information equivalents”
- Choosing a point of view
- Transparent substitutability
- Scoping the service system and the size of the “touchpoint window”

Front Stage and Back Stage

- **FRONT STAGE**: Where interactions with the service customer/ consumer happen
- **BACK STAGE**: Produces information and “stuff” needed by the front stage
- Placement of **LINE OF VISIBILITY** is a design parameter

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The McDonald's Experience

Front Stage

Back Stage

Line of Visibility

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The Gourmet Restaurant Experience

Front Stage

Back Stage

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The Benihana Experience

Front Stage

Back Stage

"Touch Points" and Service Intensity / Quality

- Services differ intrinsically in the number of touch points they require to create value; this is often called the ***service intensity***
- Traditional P2P service system design assumes that intensity is positively correlated with service quality
- This view lets us treat ***intensity as a design parameter*** to differentiate service offerings of the same type or industry domain
- The "generic" service offering is a design pattern that can be ***increased or reduced in intensity by changing the number of touch points***

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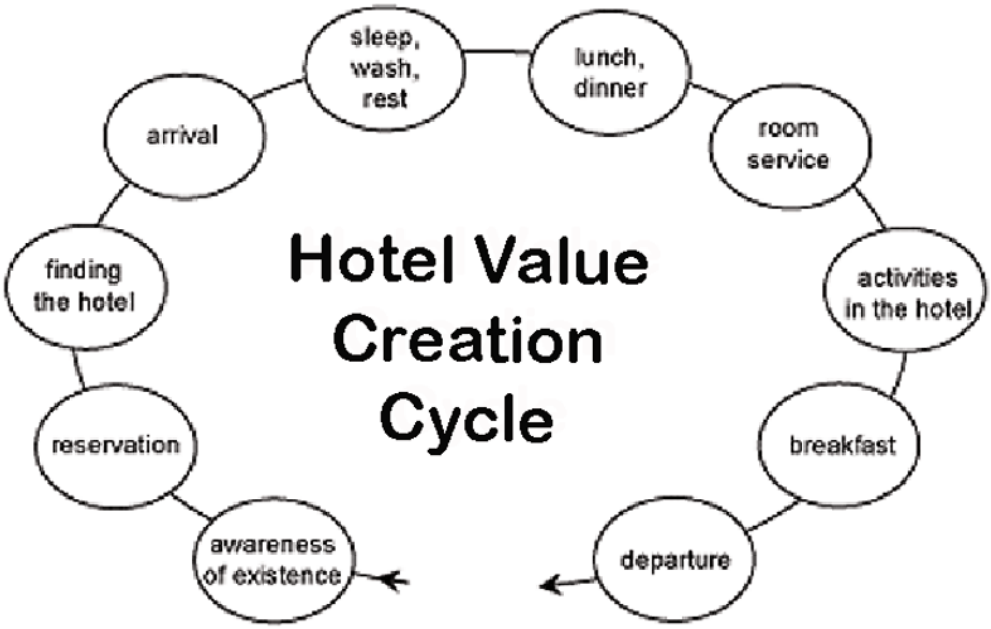
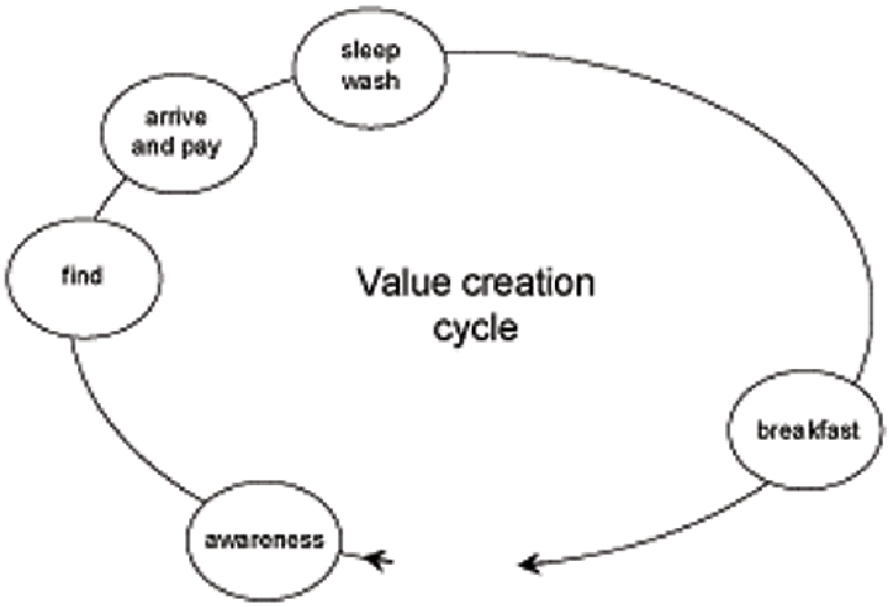
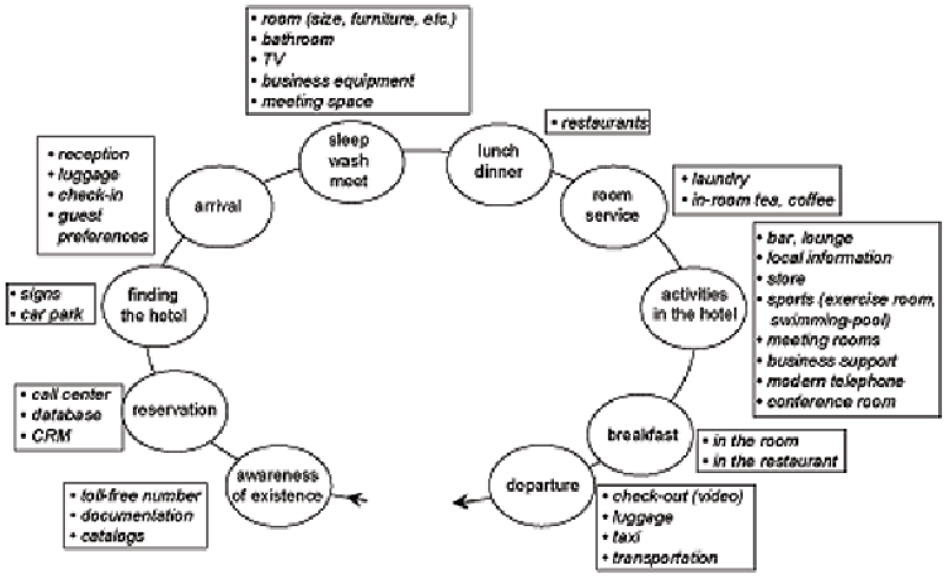
Generic Hotel "Value Creation Cycle"



Budget Hotel "Value Creation Cycle"



Luxury Hotel "Value Creation Cycle"



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Information and Interaction Substitutability

- 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"***

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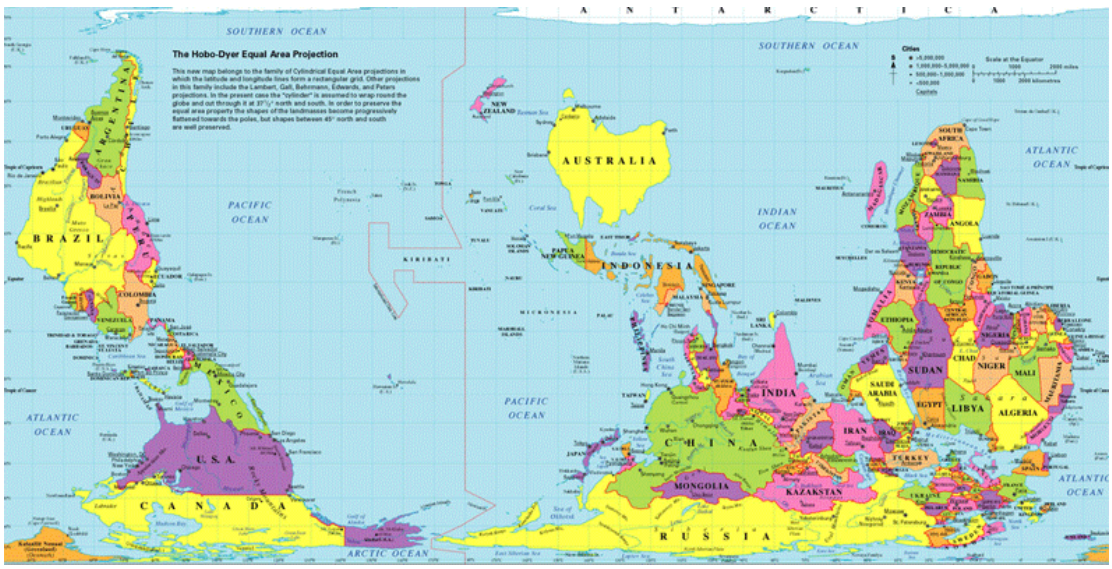
Point of View

- Designate some actor or service as the focal / primary consumer or customers
- Typically the end of the value chain or information flow, or where “users” are
- Often arbitrary, and other actors or services could be alternative POVs

Point of View



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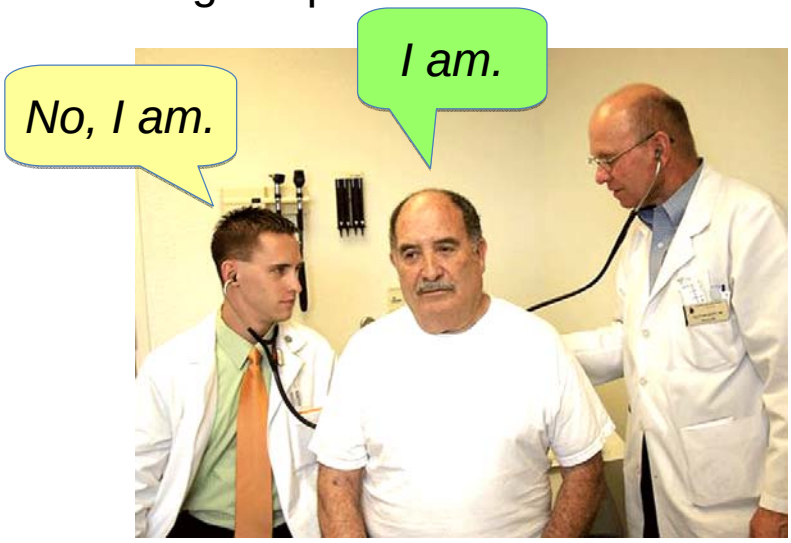
Who is the Service Customer?

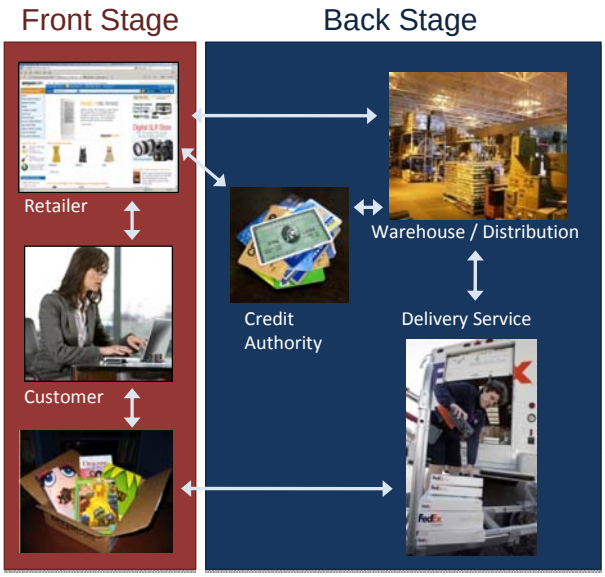
In a teaching hospital



Who is the Service Customer?

In a cooking school

Backstage-Intensive / Computational



- 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***

The Drop Shipment Pattern

Transparent Substitutability

- 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 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 Substitutability

- The same abstract Shipping Request is sent to many delivery services and one is selected to provide the service
- It probably doesn't matter to the customer which delivery service handles his package
- It might not even matter to the retailer

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Location-based / Context-Aware Systems

Location-based Service

Context-Aware Service

- 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

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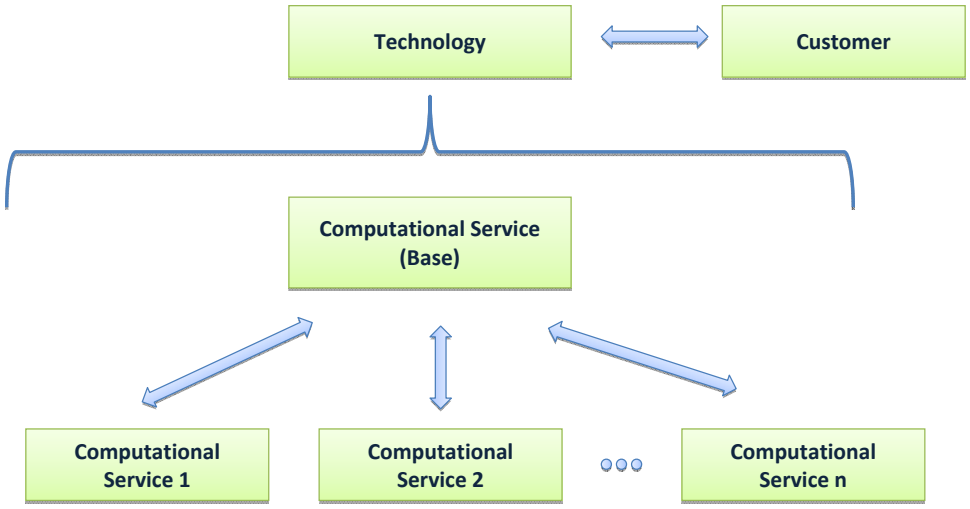
Context-Aware Context



Contexts as Building Blocks

Banking

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

(2) Tech-enhanced P2P
Tellers at bank windows

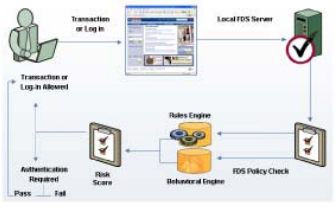
(3) Self-service
ATM

(4) Multi-channel
Online banking

(5) Multi-device
Mobile banking

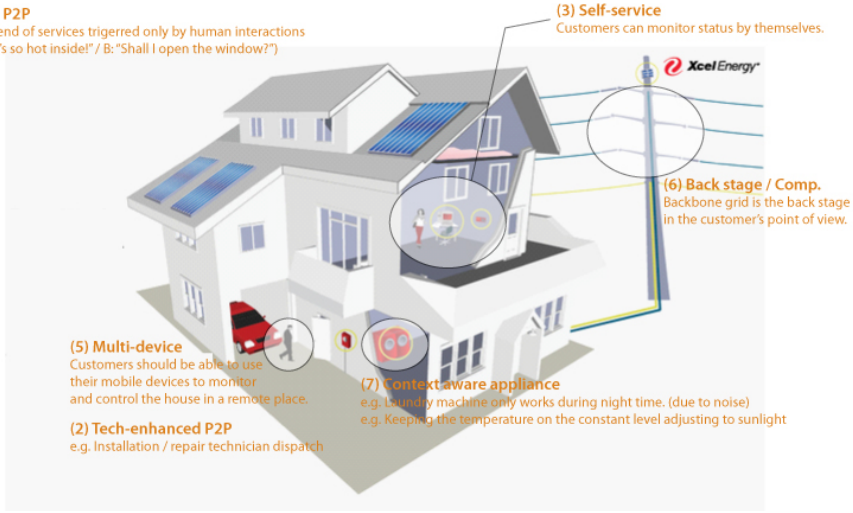
(6) Back stage / computational
Wire transfer

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



Contexts as Building Blocks

Smart home experience



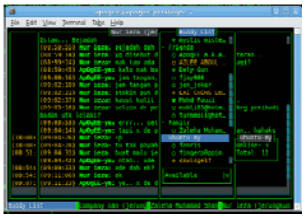
The "Smart Bookstore" [1]

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

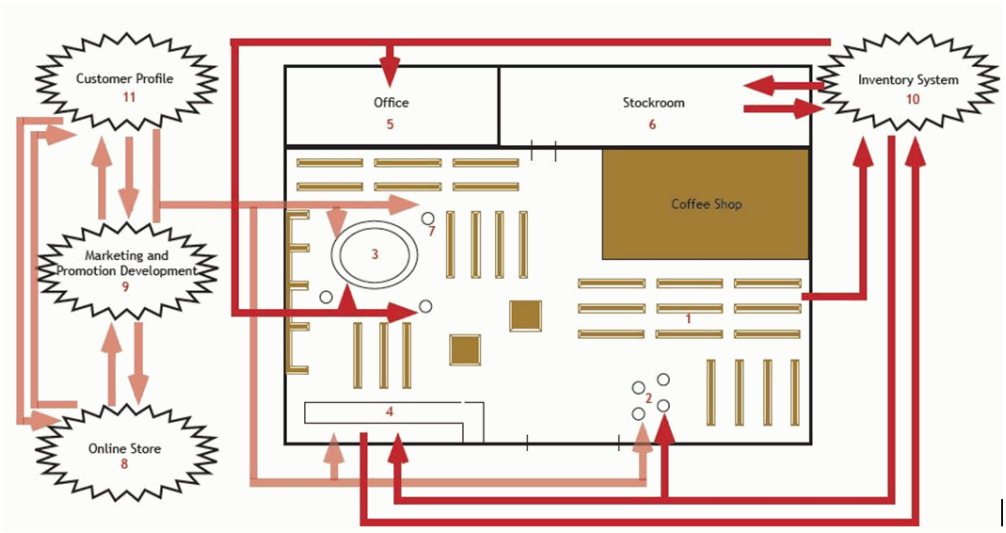
The “Smart Bookstore” [2]



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”



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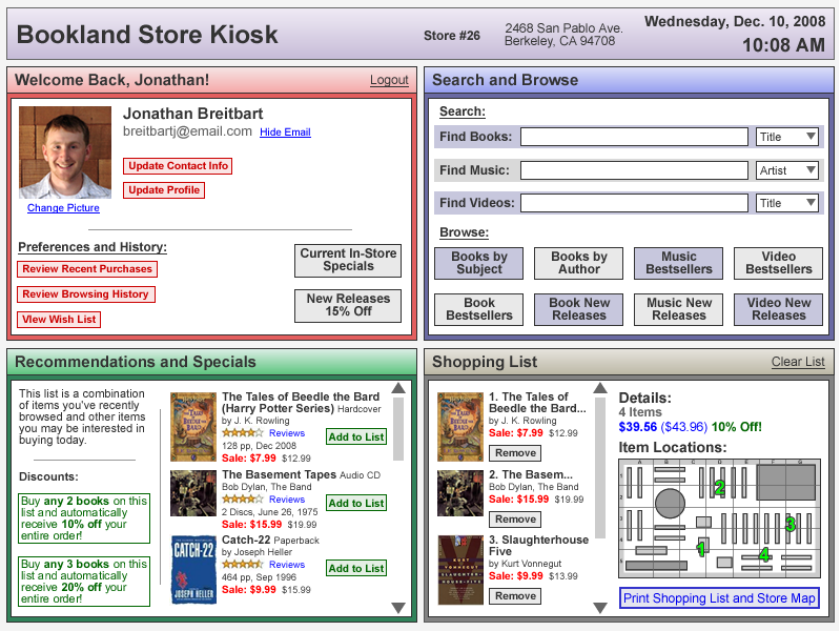
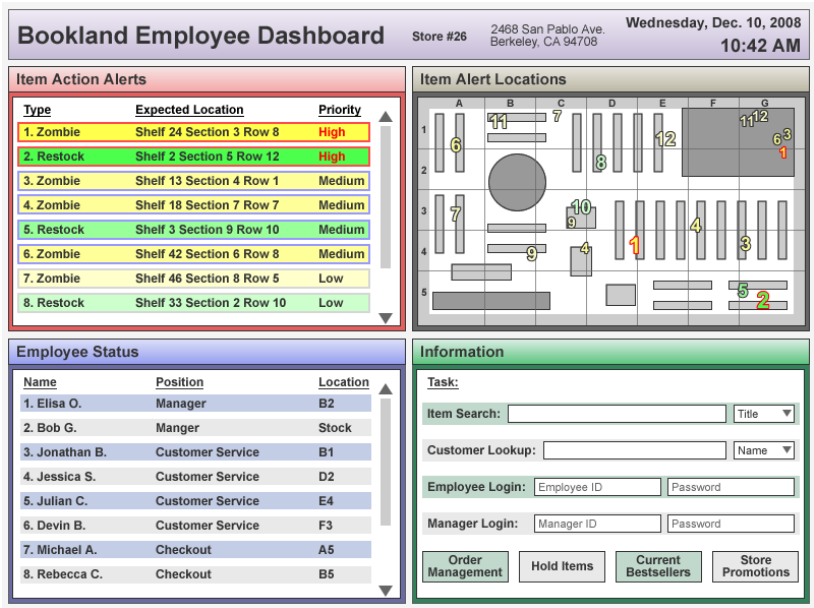
Customer Self-Service Interface



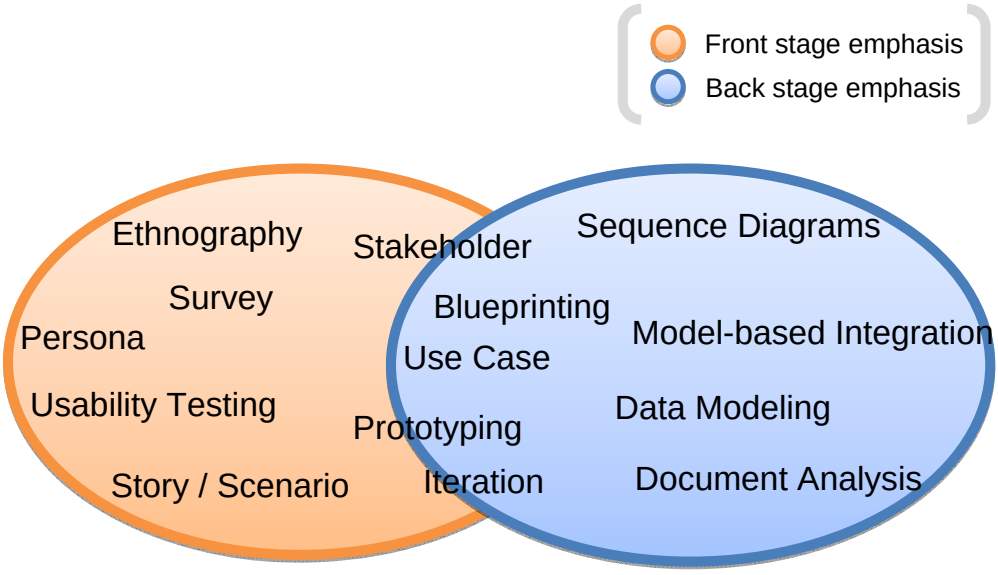
Employee Dashboard



Design Methodology with Service Contexts

- Iterative scoping (and defining the POV in) the service system determines relative importance of each context
- Choose a portfolio of appropriate design methods for the combination of contexts

Portfolio of Methods

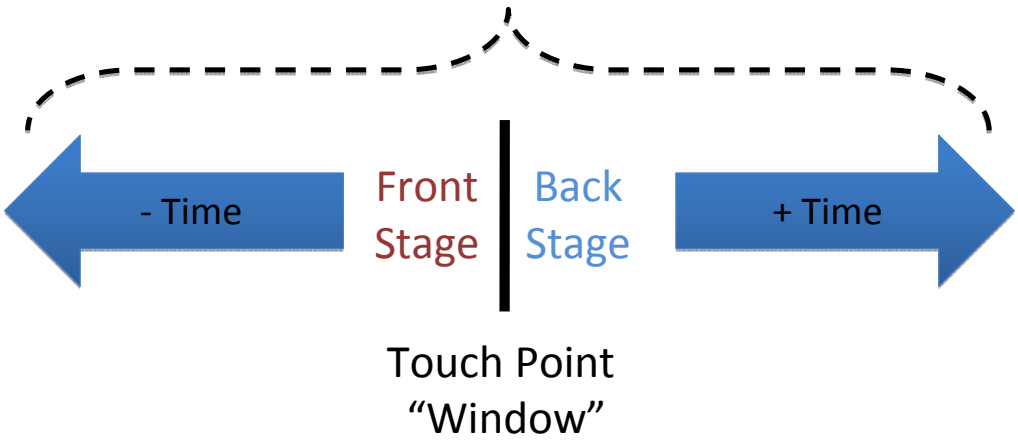


Service System Scope

- Design techniques for person-to-person services typically describe the service from the perspective of the customer and emphasize the “touch points”
- But the scope extends before and after these touch points to an extent that is itself an important design decision
- The scope is more complex with multiple channels, multiple devices, or location-based services

Service System Scope

Time is a primary dimension of scope but not the only one



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The Gourmet Restaurant Experience

Front Stage

Back Stage

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

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The “Locavore Restaurant” Service System

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

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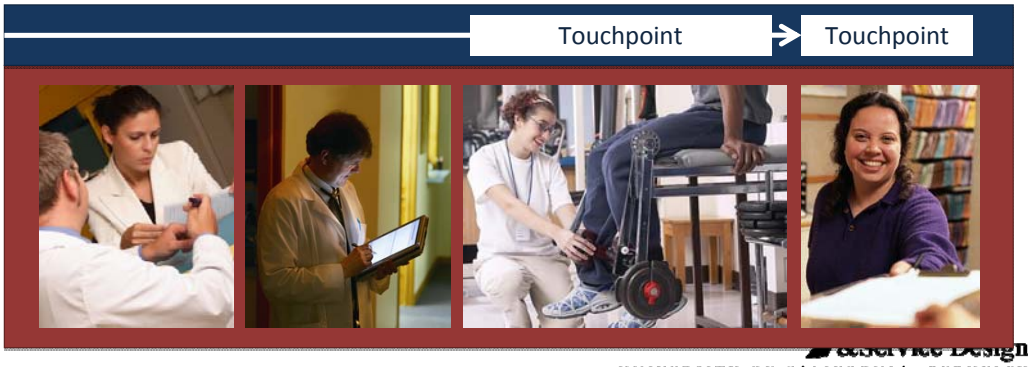
The Massage Experience

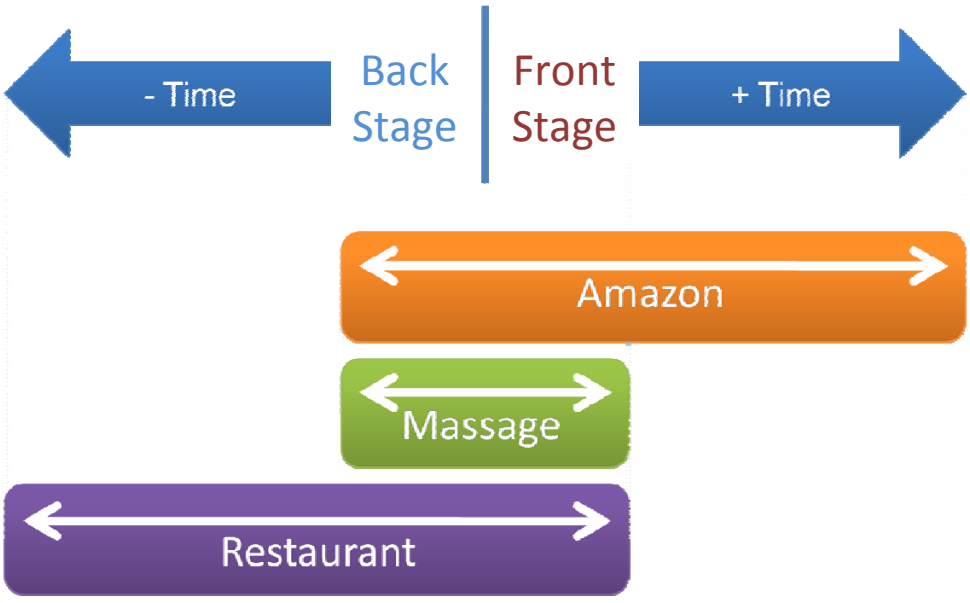
Physical Therapy



The Amazon Experience

The Stage | Warehouse | Wrapping / Distribution | Stage Again

Service System Scope



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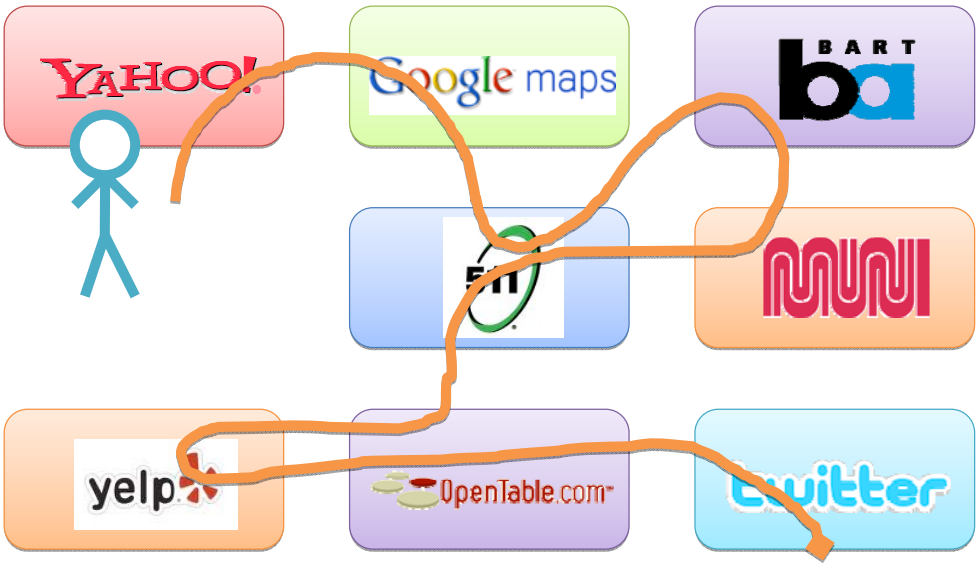
Service Systems Intersect

You're having dinner with a friend near his workplace.

- Confirm the location
- Search for a restaurant
- Read reviews and ratings
- Make a reservation
- Plan how to get there
- Share the story and pictures
- Add a review and rating
- …

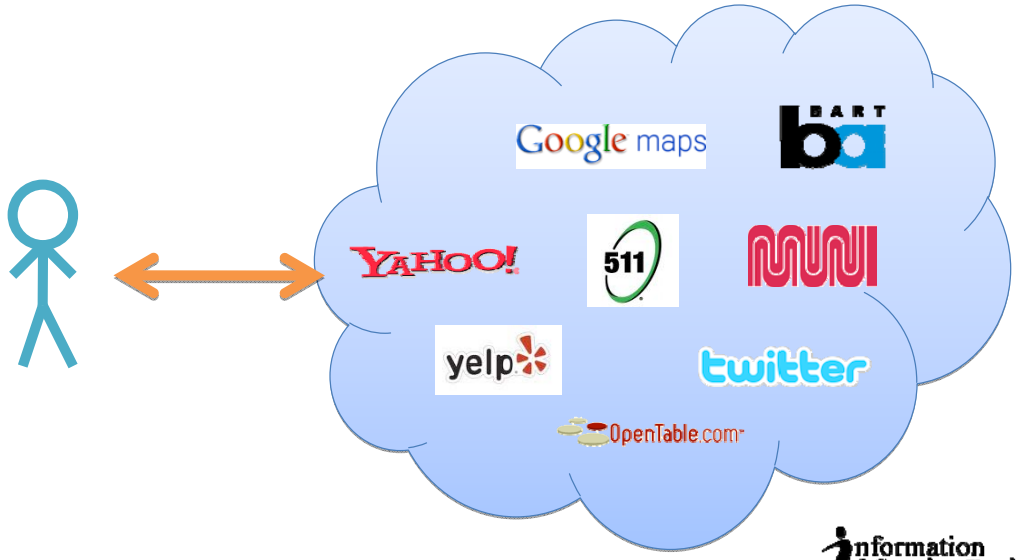
Service Systems Intersect



Today: Ad hoc composition "by eye"

From “Boundary Crossing” to “Dynamic Composition”

Future: Dynamic service negotiation and composition; automated “pruning” of non-value-adding touch points



Summary

- The seven design contexts enable a prescriptive and generative method for designing service systems
- The more abstract conception of services and service interfaces embodied in the seven contexts unifies traditional P2P and SOA visions of service system architecture and design

For More Information

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