Document Engineering in User Experience Design

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Plan for Today's Talk

Who is this guy?

What is document engineering?

The need to bridge the "front stage" and "back stage"

Document engineering in user experience design

Who Is This Guy?

Adjunct Professor at UC Berkeley "Information School" since 2002
(www.sims.berkeley.edu/~glushko/)

Came to Berkeley from Silicon Valley; founded or co-founded 3 companies in
1990s

- Hypertext Engineering

- Passage Systems

- Veo -> Commerce One

And just co-founded another company: Document Engineering Services

What Is Document Engineering?

A methodology for specifying, designing, and deploying the information models and repositories that enable document-centric applications

A synthesis of information and systems analysis, business process modeling, electronic publishing, and service-oriented architecture

"Tailing Virulent Veggies" (WSJ, 3/13/07)

THE WALL STREET JOURNAL.
ONLINE

March 13, 2007

Tailing Virulent Veggies

Produce Industry Develops Means to Pinpoint Origin Of Contaminated Products

By JANE ZHANG

Scanning RFID Tags on Vegetable Boxes

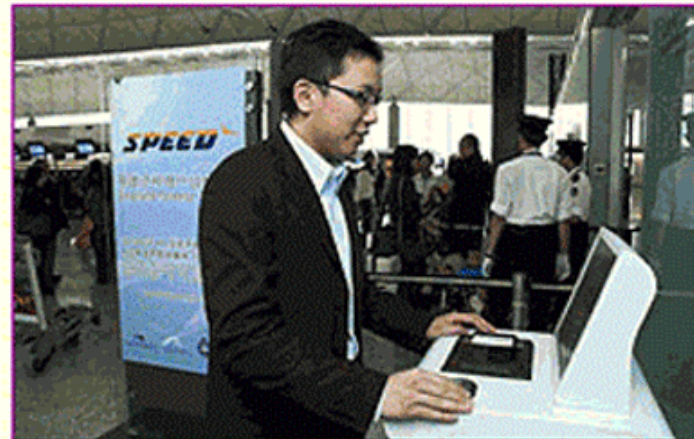# "SPEEDy Airline Self-Service"
(Hong Kong News, 1/07)

January 5, 2007

Aviation

Simplified air-travel trial launched

A six-month trial has been launched at the airport to simplify passenger travel by integrating airport, immigration and airline processes in real time, offering travellers a range of benefits.

Speedy check: Travelers can enjoy a simplified air journey with SPEED, as its kiosk can recognise biometric information saved in a special card to whisk them through security clearance.

"More Clicks at the Bricks" (Business Week, 12/6/07)

BusinessWeek — **More Clicks at the Bricks**

How retail stores are scrambling to catch up with shoppers empowered by the Web

by Nanette Byrnes   **RETAILING** December 6, 2007,

The Web and other information and communications technologies have substantially affected consumer behavior

Retail stores are offering new kinds of information services

The "shopping experience" reflects information flows within and across physical and digital channels

The Multi-channel Shopper

THE INFORMED CONSUMER
Wholesale changes in the way we shop

69% Research products online before going to a store to make a purchase

62% Have looked at least once at an online peer review before making a purchase

39% Compared a product's feature and price across retail outlets online before buying

61% Want to be able to scan bar codes and access information on other stores' prices

9% Used a cell phone to text-message a friend or relation about a product while shopping

The Common Themes in These News Items

Information technology and business processes are co-evolving

New business processes are created / coordinated / choreographed via the management and exchange of electronic documents

Standards / patterns for documents and business processes are essential
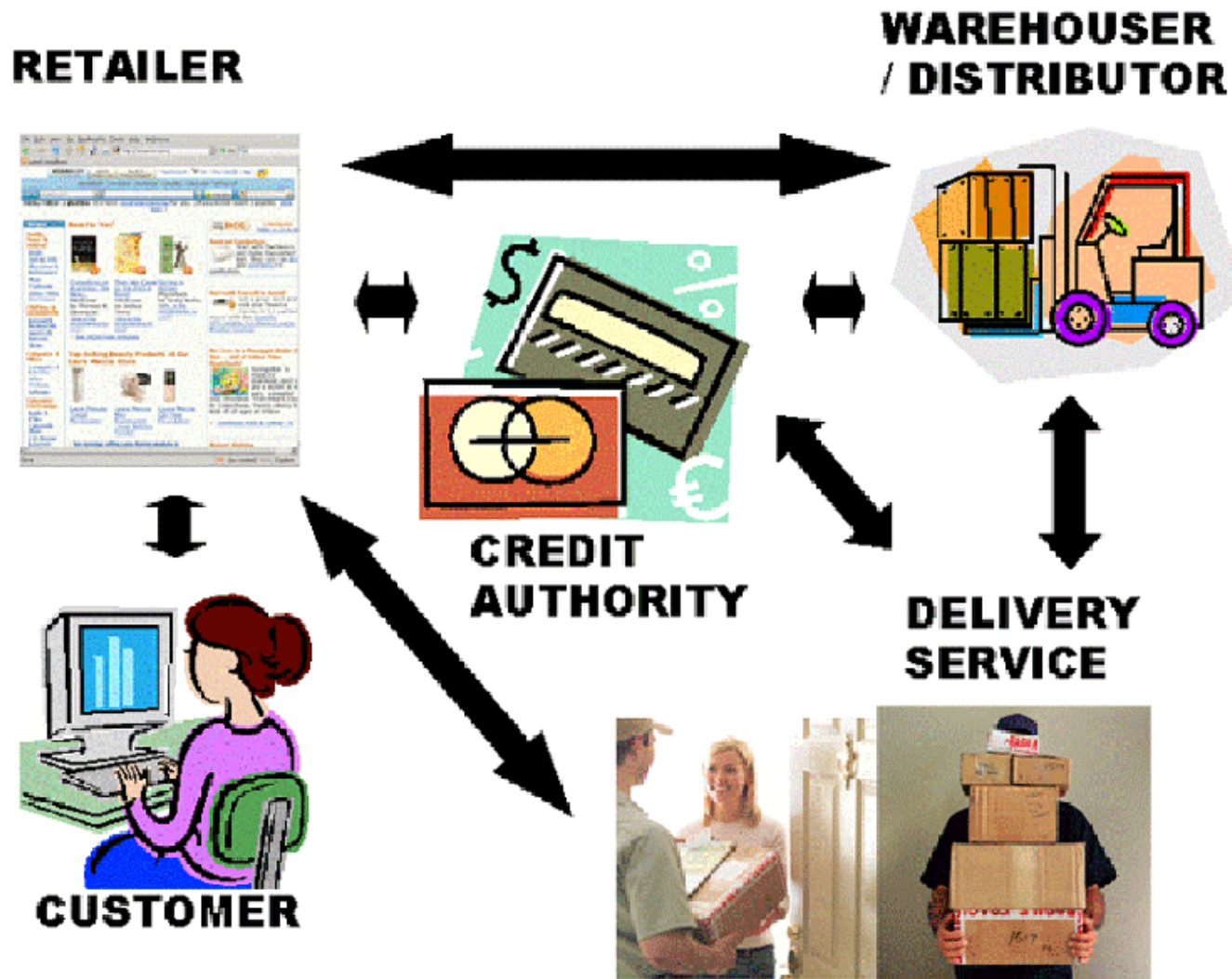
Document Exchange Patterns

Businesses have long dealt with each other by exchanging documents

Concepts like "supply chains" and "distribution channels" are metaphors for the coordinated flow of information and materials/products

The processes are "glued together" by overlapping information components in the documents
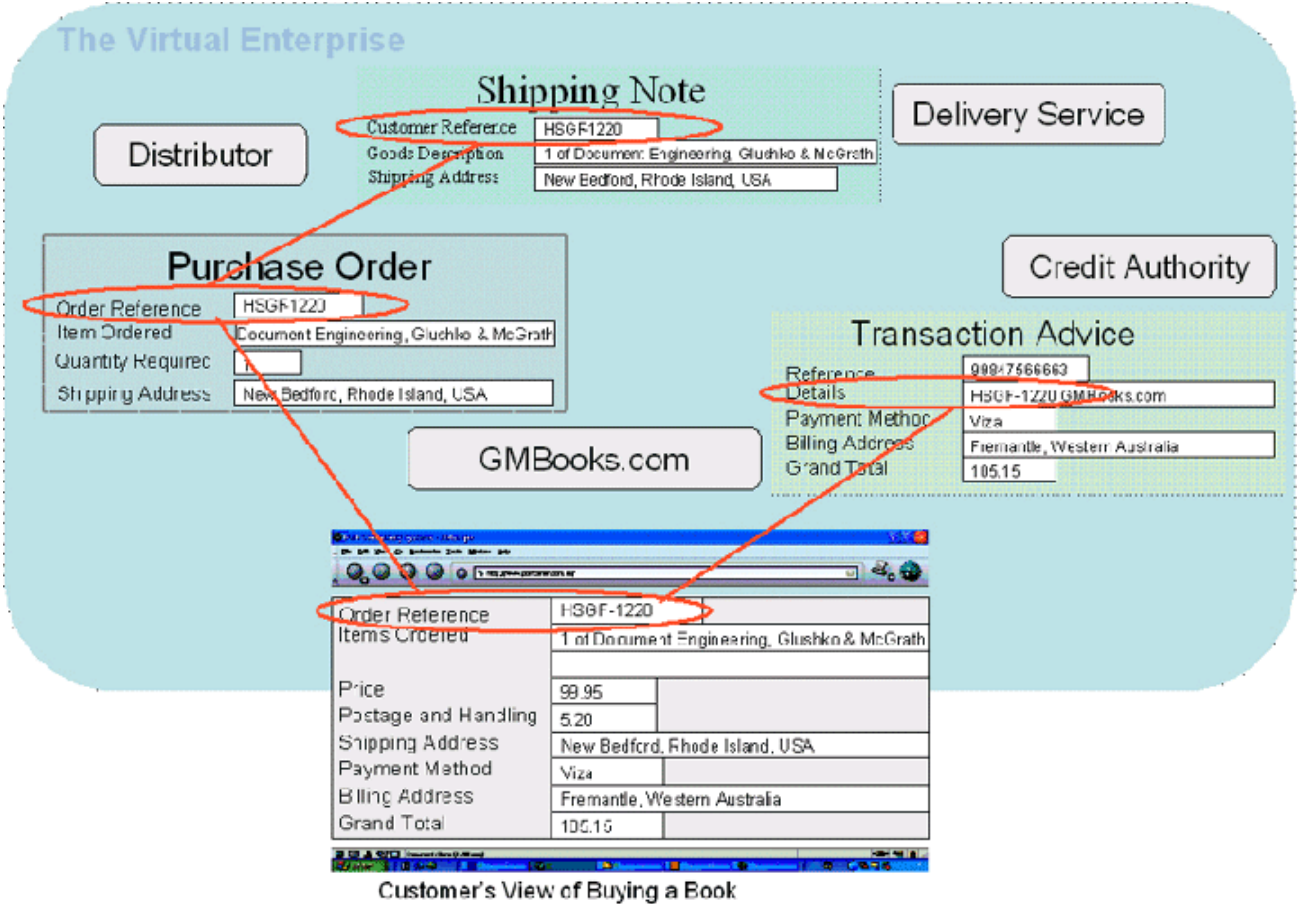
"Drop Shipment" Pattern

RETAILER

WAREHOUSER / DISTRIBUTOR

CREDIT AUTHORITY

DELIVERY SERVICE

CUSTOMER

The Virtual Store as Choreographed Document Exchanges
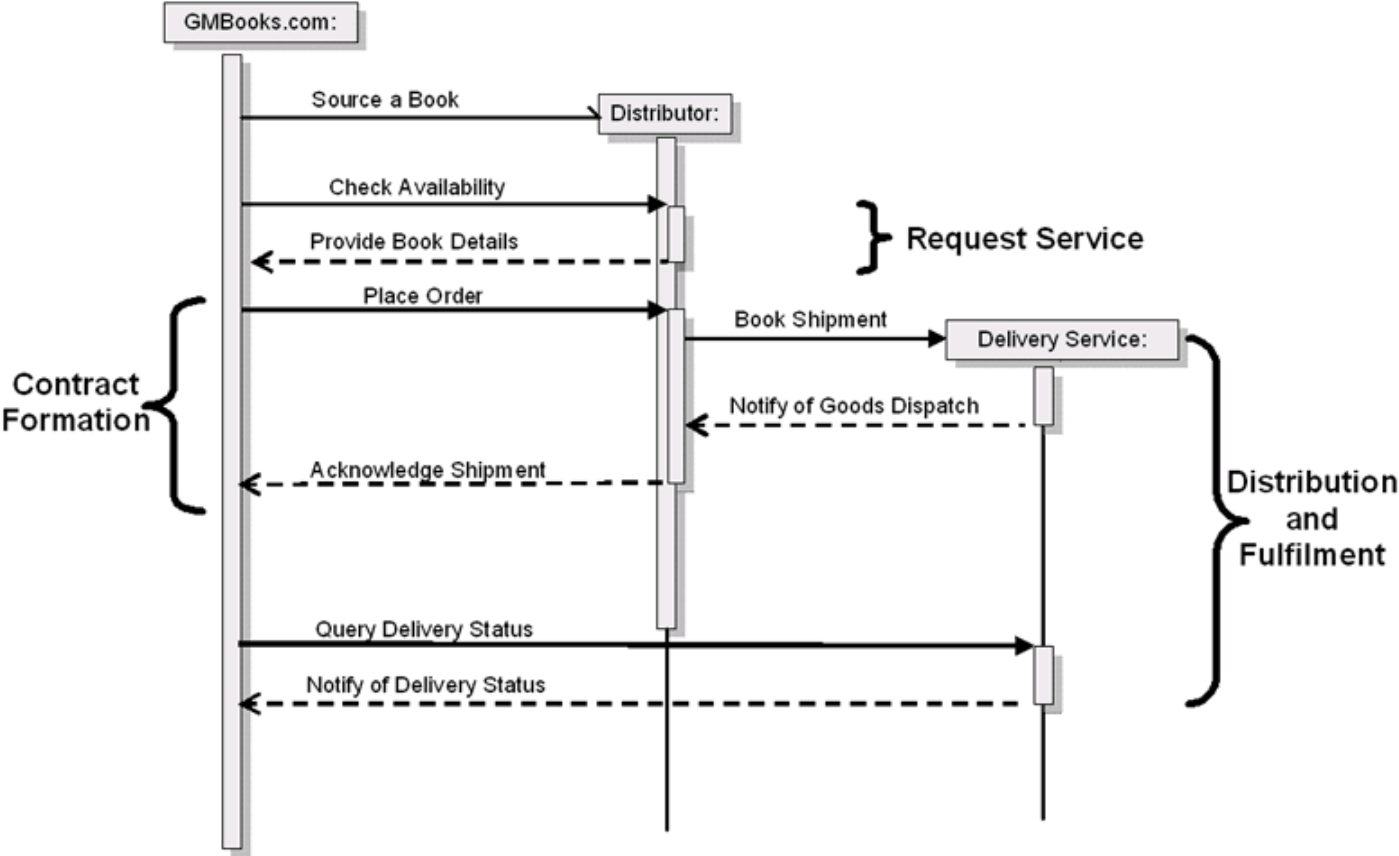
Overlapping Information Models in the Virtual Store

Customer's View of Buying a Book

My Aha Moment

For nearly 20 years I'd worked in single source publishing and B2B document exchange to apply document engineering concepts to design models of document types and processes

Of course people / users were involved, but they didn't play a prominent part in the document engineering methodology

Traditional design approaches were preventing from seeing the whole problem

The Traditional View of User Experience Design

Traditional concepts of user experience design emphasize person to person interactions

This approach focuses on the "touch points" or "encounters" or "moments of truth" where a service or experience is delivered to or received by the customer

It implies that a richer or more personalized "user experience" is usually better

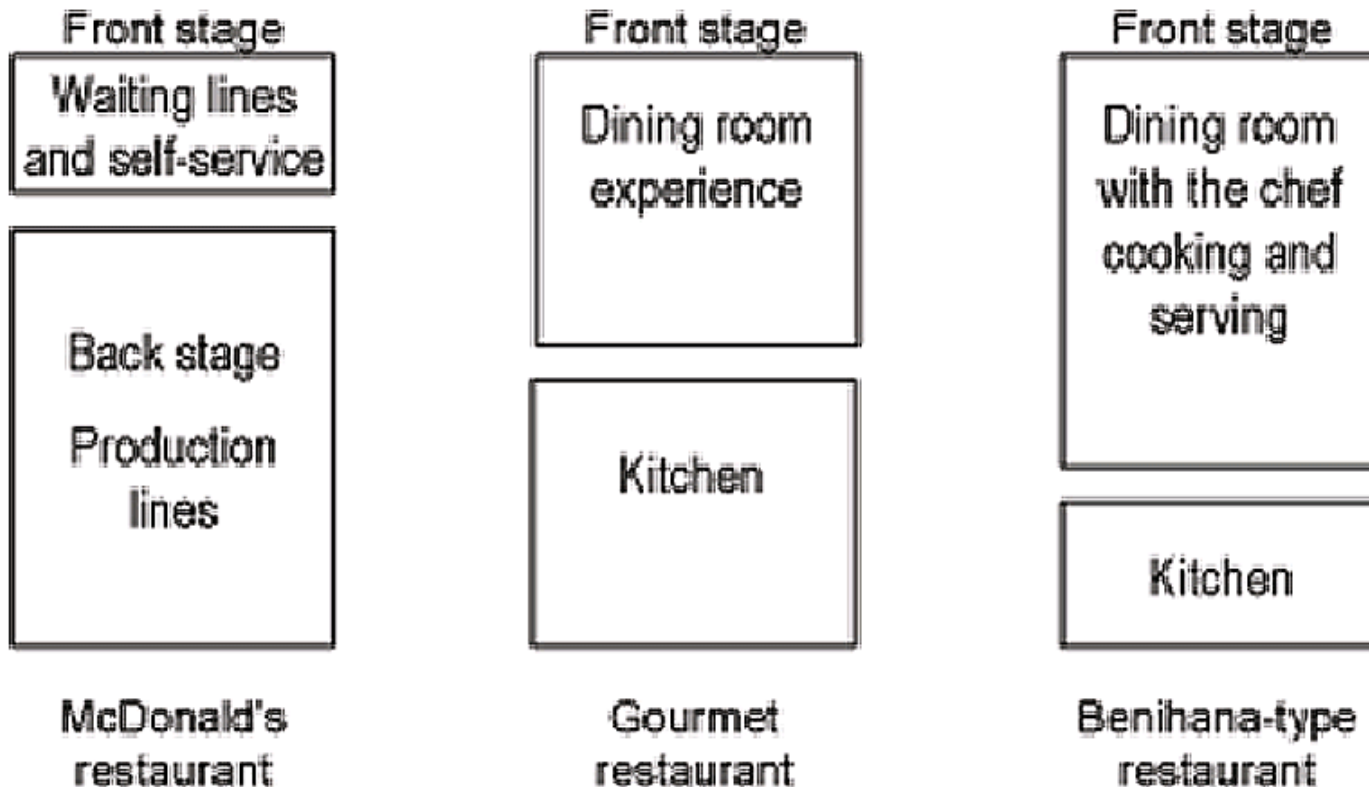# The Front Stage / Back Stage Distinction

A focus on the service encounter implies a sharp distinction between the interactions between the customer and provider that are part of the service encounter (the "FRONT STAGE") and other activities that precede it to make it possible (the "BACK STAGE")

The boundary between the two stages is the LINE OF VISIBILITY

Different "Lines of Visibility" in Restaurants

Front stage
Waiting lines and self-service

Back stage
Production lines

McDonald's restaurant

Front stage
Dining room experience

Kitchen

Gourmet restaurant

Front stage
Dining room with the chef cooking and serving

Kitchen

Benihana-type restaurant

Radical Claims Start Here

Many design ideas and methods need to be substantially rethought now that "service" is a much broader concept

The "moment of truth" reveals service quality, but rarely determines it

Front stage / back stage is not an architectural distinction - it is just a point of view

It embodies some design biases that cause problems in service system design

The Hotel Service Encounter

What's the Quality of this Service Encounter?

HOTEL RECEPTION EMPLOYEE: Welcome, Dr. Glushko, it is good to see you again. We've once again reserved room 321 for you. And last year when you were here you had us get some hockey tickets, so we got some good seats for you for tomorrow night's game.

CUSTOMER: Thanks.

What's the Quality of this Service Encounter?
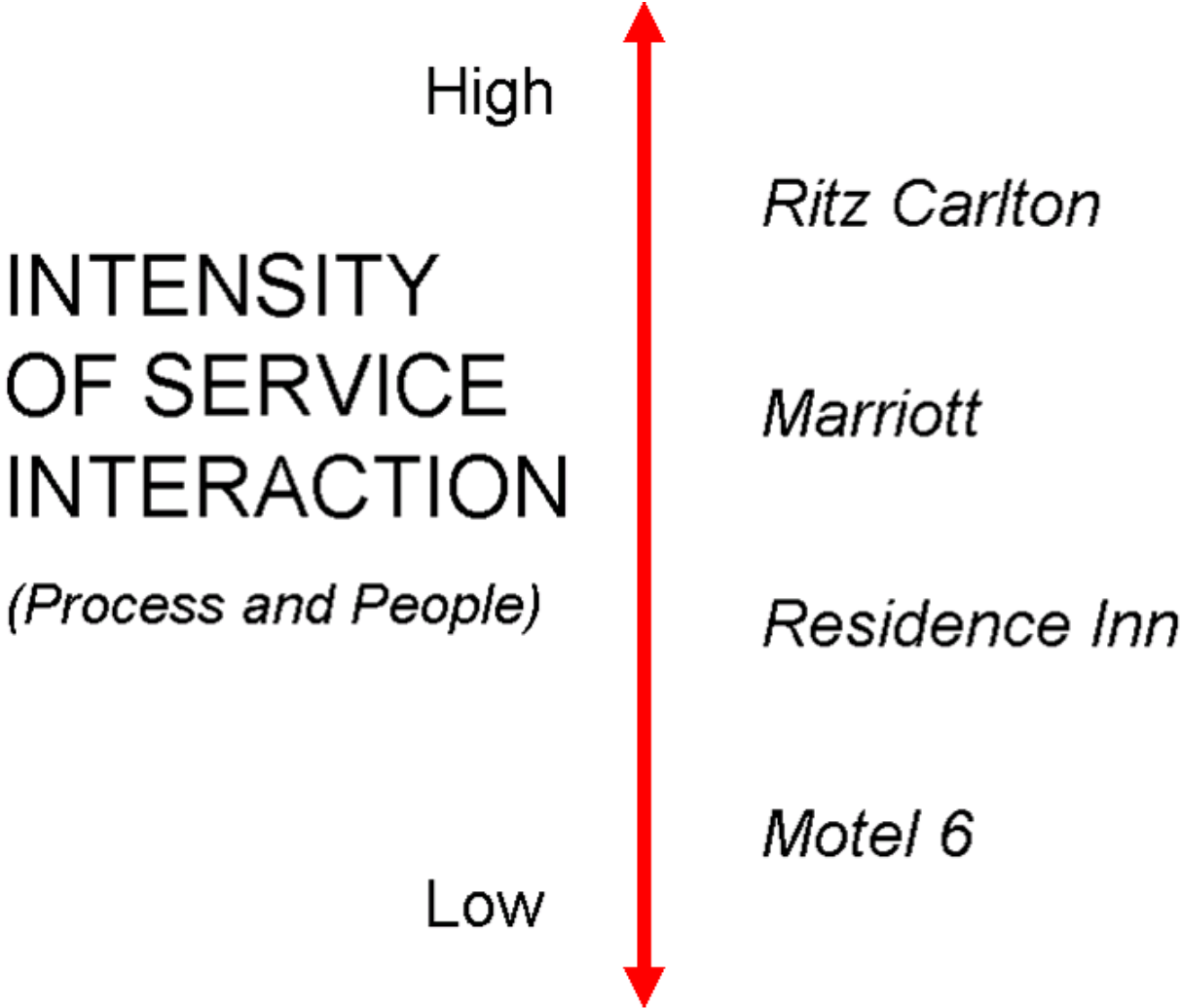
HOTEL RECEPTION EMPLOYEE: Last name?

CUSTOMER: Glushko

HOTEL RECEPTION EMPLOYEE: You're in room 321. Here's your key.

CUSTOMER: Thanks.

Simplistic View of Service Quality

High

Ritz Carlton

INTENSITY
OF SERVICE
INTERACTION

Marriott

(Process and People)

Residence Inn

Motel 6

Low

An Intense but Low Quality Encounter

HOTEL RECEPTION EMPLOYEE: Your name, sir?

CUSTOMER: Glushko

HOTEL RECEPTION EMPLOYEE: I'm sorry, sir. We have no reservation under that name, and we're completely booked tonight.

CUSTOMER: That's ridiculous. Here's my web confirmation page.

HOTEL RECEPTION EMPLOYEE: I'm sorry, sir. We have no reservation for you. We are profoundly sorry. Why don't you wait in the lounge while we call one of our partner hotels and get a room for you...

CUSTOMER: This is completely incompetent. I'm tired...

HOTEL RECEPTION EMPLOYEE: I'm sorry, sir. We will pay for your room tonight at our partner hotel or give you a voucher for a free night here on your next stay.

Self-Service Hotel Check-In

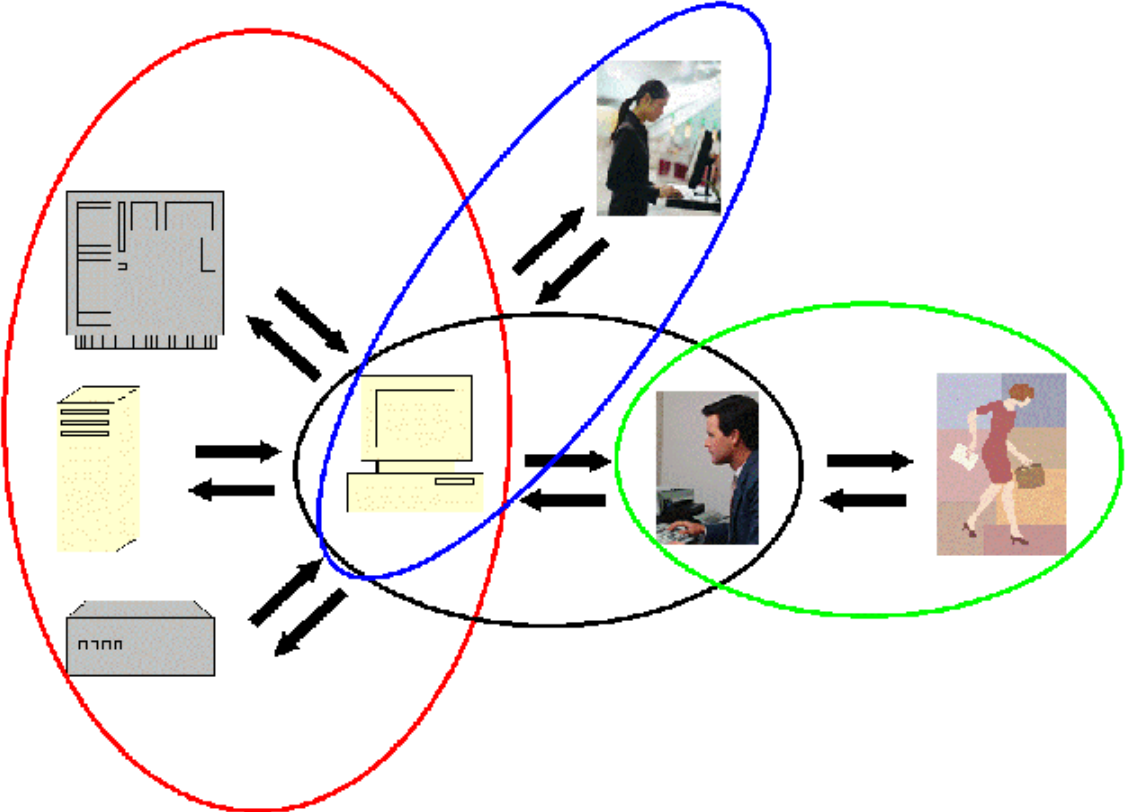# What's the Quality of this Service Encounter?

AUTOMATED CHECK-IN SERVICE: Please insert your credit card

CUSTOMER: (Inserts credit card)

AUTOMATED CHECK-IN SERVICE: (issues digital key card) Room 321. Here's your key.

Four Types of "Encounters" in Hotel Check-In

Quality in the Hotel Check-In Service System

There may be a "moment of truth" at the time of check-in when the quality of the service experience becomes apparent to the customer

..., but that quality is enabled or constrained by all of the service encounters

...even though many of these encounters don't involve or are invisible to the customer, and some of them are even invisible to the hotel employees

Service Encounters are Information Exchanges

For many services, the information exchanged through the service interface is the primary determinant of the value received or experienced by the service consumer

Treating ALL service encounters abstractly as information exchanges highlights the inputs and outputs and the choreography with which the provider and consumer exchange information

This perspective de-emphasizes the obvious differences between person-to-person services and computational or automated ones

It challenges conventional wisdom about design

The Concept of a "Service System"

This unifying abstraction of service encounters as information exchanges gets us to the SERVICE SYSTEM as the appropriate framework for understanding how information-driven user experiences work

It also 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

--- eliminating a person-to-person interaction with automation

--- delivering similar or complementary services through multiple channels

Defining "Service System"

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

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

A New Yorker's Point of View

Front Stage and Back Stage Inversion: Cooking School, or Restaurant?

KITCHEN

Front Stage for the Cooks
Back Stage for the Customers

DINING ROOM

Front Stage for the Customers
Back Stage for the Cooks

Bridging the Front Stage and Back Stage in Service Design

Front stage / back stage is not an architectural distinction -- it's a point of view

And it embodies some design biases that cause problems in system design

But if we design the system as a whole rather than as front stage + back stage, we can overcome these problems

The Front Stage 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

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

The Back Stage Mindset

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

Use concepts and techniques from document engineering, content management, 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

Resolving the Tension: Bridging the Back Stage and Front Stage

The tensions between the back stage front stage are not intrinsic and unavoidable

"Merging the mindsets" with multidisciplinary design teams is an obvious, necessary, and insufficient

We need a design methodology that cuts through these mindsets

Design the Service System!

Design services to be modular and configurable

Create information flow and process models that span both the back and front stages

Create "actionable" user models of appropriate detail using both front and back stage content

Implement "model-based user interfaces"

Information Flow and Process Models that Span the Service System

Supply chains, marketplaces, demand management, queuing theory, etc. are useful methods and frameworks for designing service systems

Some of these modeling approaches can shape service quality or experience for specific users

Who "Drives the User Model" as a Service System Design Choice

The same user model can often be driven or exploited by either the service provider or the service consumer:

--- Use a user profile for a recommender system (provider driven) or to drive a consumer agent

--- A "Service Level Agreement" can be defined in either provider or consumer terms

"Customization" and "Personalization"

Customers want services and experiences that fit their individual needs

A designer needs to determine:

--- What information is required to customize the service or experience?

--- Where can this information come from?

Where Does the Information Come From?

From the consumer, explicitly or implicitly

From data brokers, using keys obtained from the user

From other users who are similar

From descriptive or predictive models built using all of the above

Asking a Personalization Design Question in a "Service System Way"

Is it more intense to ask the user questions in a person-to-person encounter, or to fill out a self-service form?

It is more intense to ask the user to complete one complicated form or several simple ones over time?

Instead of either of these explicit user interactions, can we use information we already have to make it unnecessary to collect information from the user?

"Pay As You Drive" Insurance

Most insurance is sold using customer segmentation based on historical data

The cost of PAYD insurance reflects actual risk, and thus incents drivers to adopt safer habits

Current Pricing

Motorist Reduces Vehicle Trips
⇩
Reduced Crashes and Claim Costs
⇩
Cost Savings
(Dispersed to all motorists within the rate class)

Efficient Pricing

Motorist Reduces Vehicle Trips
⇩
Reduced Crashes and Claim Costs
⇩
Cost Savings
(Returned to the individual motorist)
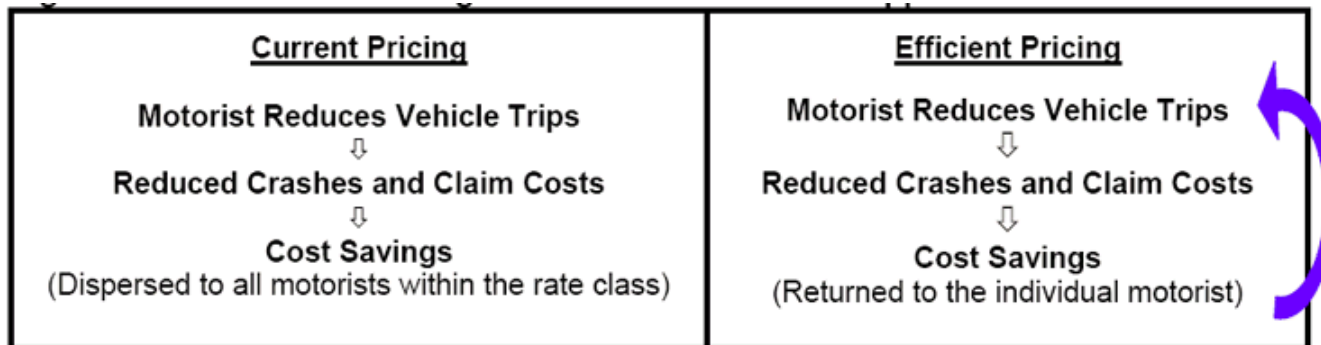
With current insurance pricing, crash cost savings from reduced driving are dispersed to all motorists in their rate class. PAYD pricing returns more savings to individuals who reduce their driving. This rewards motorists for reducing mileage and makes premiums more accurately reflect the insurance costs of each individual vehicle.

Mass Customization / "Segments of One"

The key to mass customization for products is a configurable architecture and design based on a set of pre-designed components or modules that can be combined into a variety of products with different capabilities

We are just beginning to learn how these ideas apply to services and user experiences

Model-Based UI and UX

Back stage designers explicitly use models as specifications for generating code or configuring an application

In contrast, methods used by front stage designers to design and implement user interfaces are dominated by iterative and heuristic techniques that are not explicitly model-based

Model-based implementation isn't appropriate for all user interfaces, but seems especially promising for multichannel services that are offered across a range of contexts or devices

Model-based techniques would make it possible to generate a consistent set of self-service user interfaces

Model-based UIs Personalized at Run Time

Fresh Direct is an intensely automated online grocery service; uses "bto" pattern to optimize and speed order fulfillment

Customer-specific user interfaces mean that a vegetarian customer never sees the virtual meat aisle, and should only see recipes that call for the products he buys

Using historical transaction information, in 2006, during the California spinach E. coli contamination, FreshDirect's systems used customer transaction history to send customer-specific messages

Personalized Banking... (More or less)

Truly Personalized Banking

The website doesn't just show me my accounts:

--- It stops asking me to open accounts or get other services I already have

--- It recommends a credit card based on my spending habits rather than listing them all

--- The user interface makes it easy to do my regular interactions

--- Personalization makes use of all of my interactions - in the bank, with the ATM, the IVR, and online

--- The ATM and IVR user interfaces and interactions are also reconfigured

We're Getting Closer

Summary

Traditional concepts in service design -- the moment of truth, the front stage / back stage distinction -- don't always help us understand today's more information-intensive and multichannel service systems

We need a methodology for designing service systems that takes a more horizontal or "end-to-end" view

The idea that all services can be viewed abstractly as information exchanges is a key part of this new approach

But What's The Real Point?

Most document-oriented professionals spend their careers working exclusively on "back stage" design issues

Some spend their careers working on "front-stage" design issues

Many new and exciting design challenges - multichannel systems, applications that must run on a range of platforms, location-based services -- require a design mindset that bridges the front and back stages

Get there ahead of everyone else!