

Bridging the "Front Stage" and "Back Stage" in Design

INFO 213 -- 17 April 2008

Bob Glushko

Plan for Today's Talk

Rethinking Traditional Concepts in (INFORMATION-INTENSIVE or SERVICE) Design

From "Service Design" to "Service System Design"

Bridging the Front Stage and Back Stage Mindsets

Models and Methods for Service System Design

The Traditional View of Services

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

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

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

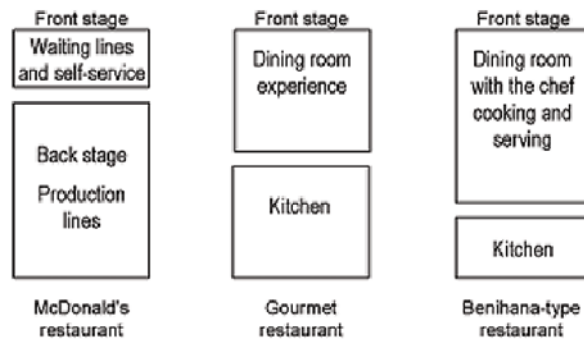
The Front Stage / Back Stage Distinction

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 and other activities that precede it to make it possible:

- . The FRONT STAGE represents the interaction the customer or service consumer has with the service
- . The BACK STAGE is the part of the service value chain that the service consumer can't see

The boundary between the two stages is the **LINE OF VISIBILITY**

Different "Lines of Visibility" in Restaurants



Radical Claims Start Here

All of the concepts I've just mentioned 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 a point of view and a specification about the scope in a service system... and is recursive

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

The Hotel Service Encounter



7 of 54

4/17/2008 3:05 PM

Bridging the Front Stage and Back Stage in Design (1)

file:///C:/Documents%20and%20Settings/glushko/My%20Documents/Lectures/210-F2007/21...

What's the Quality of this Service Encounter?

HOTEL RECEPTION EMPLOYEE: Welcome, Dr. Glushko, it is good to see you again. You said you liked room 321, the corner room with the bridge view, so we've reserved it once again for you. And last fall when you were here you had us get some baseball game tickets because the Red Sox were in town, and it just happens that they're playing again tomorrow night so we got some good seats for you.

CUSTOMER: Thanks.

8 of 54

4/17/2008 3:05 PM

What's the Quality of this Service Encounter?

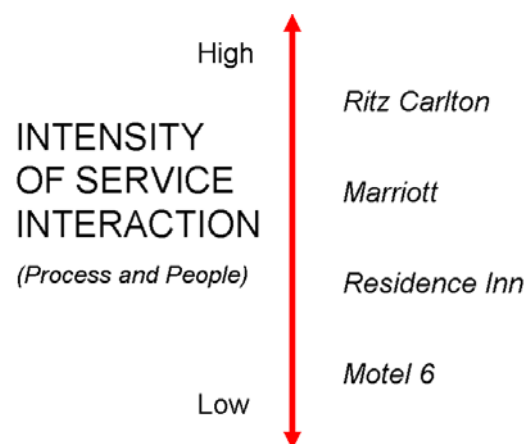
HOTEL RECEPTION EMPLOYEE: Last name?

CUSTOMER: Glushko

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

CUSTOMER: Thanks.

Simplistic View of Service Quality



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



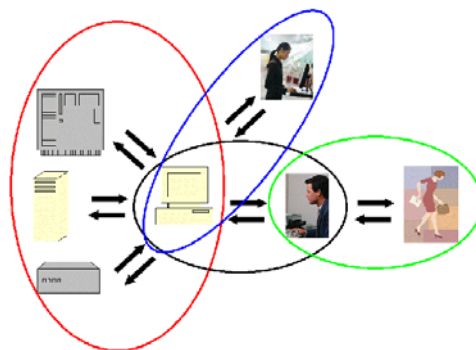
What's the Quality of this Service Encounter?

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

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

Service Encounters are Information Exchanges

For many services, especially those with a significant technology / information component, the information exchanged through the service interface is the primary determinant of the value received or experienced by or co-created with 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 to initiate and deliver the service

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

It challenges conventional wisdom about design and suggests new ways to teach it

From "Service" to "Service Systems"

This unifying abstraction of service encounters as information exchanges gets us to the SERVICE SYSTEM as the appropriate framework or perspective for understanding how services 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 (e.g, through outsourcing)
- . eliminating a person-to-person interaction with automation
- . deliver similar or complementary services through multiple channels ("bricks and clicks", mobile, messaging, ...)

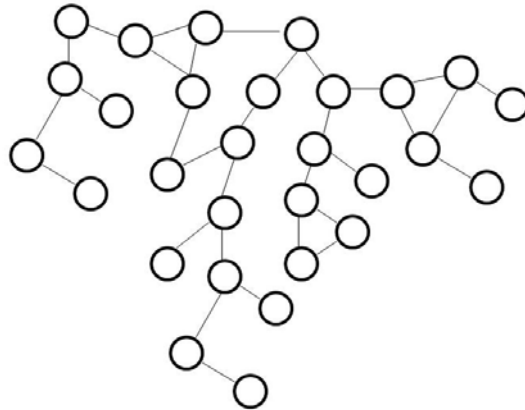
Defining "Service System"

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

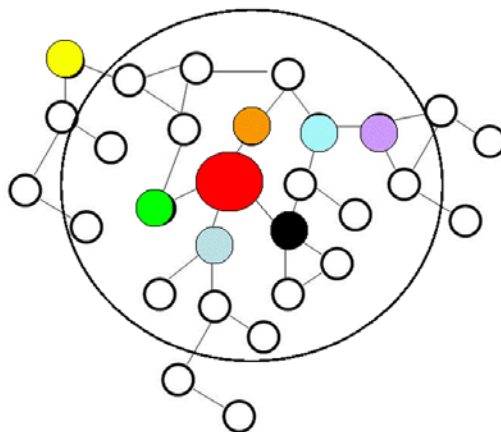
A set of related services can define a SERVICE CHAIN or SERVICE NETWORK or VALUE CHAIN

Designating the last consumer in a service chain as the POINT OF VIEW establishes a perspective or context in the service system

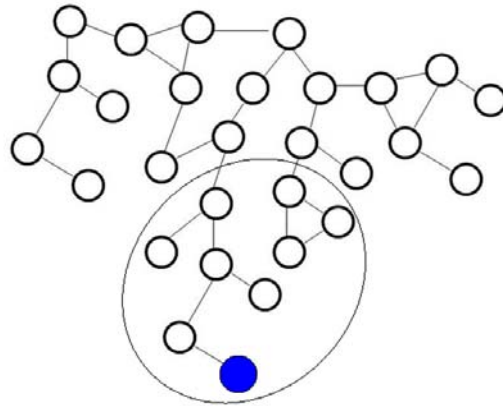
Visualizing a Service System



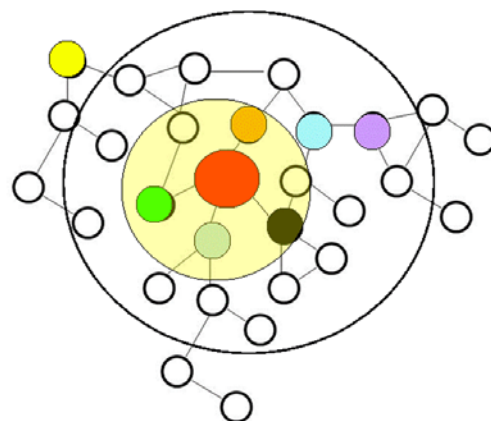
A Point of View in a Service System



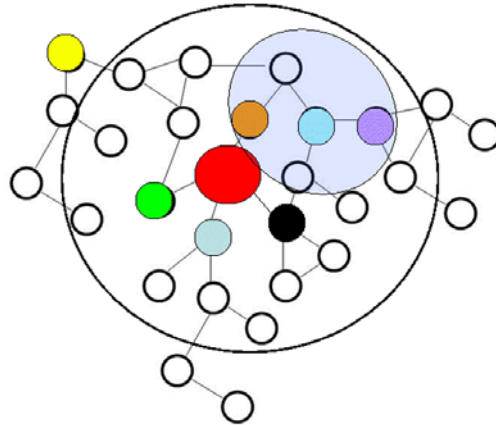
Different POV in a Service System



Visualizing the Front and Back Stages



Front and Back Stages with Different POV



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**

The Context of Design

The design of any service -- whether it will be performed by people or by information systems -- takes place in a context of:

- . Current and potential customers
- . Current and potential technologies
- . Current and potential competitors
- . Existing services or systems
- . Existing user or application interfaces
- . Legal, regulatory, cultural systems and constraints

These factors or constraints can never be equally important; how they are weighted determines the appropriate design methodology and the key characteristics of the design

But each stakeholder - or different points of view -- might weight them differently

Bridging the Front Stage and Back Stage in Service Design

Front stage / back stage is not an architectural distinction

It is just a point of view and bounded scope in a service system

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

But if we design the service 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 such as ethnographic research and the user-centered design

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, 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 | • Back Stage Designers |
| – Usability | – Efficiency / Productivity |
| – Responsiveness | – Robustness |
| – Flexibility / Customization / Uniqueness | – Standardization / Reuse |
| – Transparency | – Scalability |
| – Enjoyment | |

Resolving the Tension: Bridging the Back Stage and Front Stage

The tensions between the back stage front stage are not intrinsic and unavoidable; they are just a consequence of too narrow a design perspective

"Merging the mindsets" with multidisciplinary design teams is an obvious and necessary correction, but it is not sufficient

We need a methodology for designing service systems that cuts through these mindsets

Design the Service System!

Design services to be modular and configurable

- ... to enable them to be easily substituted for
- ... to enable them to be easily made visible or invisible to other parts of the service system

Create information flow and process models that span both the back and front stages, and exploit design patterns when appropriate

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

Implement "model-based user interfaces"

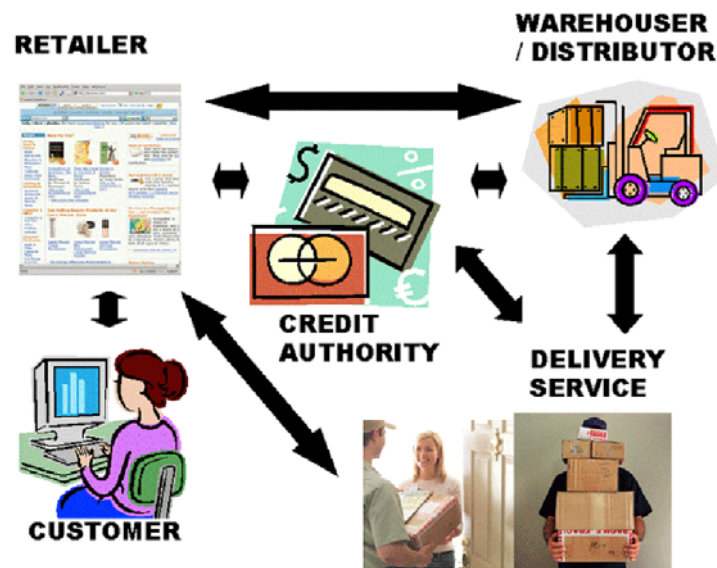
Information Flow and Process Models that Span the Service System

We have many useful modeling methods and frameworks for designing service systems: supply chains, marketplaces, demand management, queuing theory, etc.

Many of these ensure some level of service quality by "trading information for inventory" and balancing capacity and demand in a coarse or aggregate manner

Other modeling approaches (e.g. data mining, business intelligence, intelligent dispatch) can shape service quality or experience for specific customers (e.g., personalization systems, customer selection for service)

Web Retail Service System - "Drop Shipment" Pattern



33 of 54

4/17/2008 3:05 PM

Bridging the Front Stage and Back Stage in Design (1)

file:///C:/Documents%20and%20Settings/glushko/My%20Documents/Lectures/210-F2007/21...

Create "Actionable" User Models

Front and back stage designers and other stakeholders create different models of the user

Unfortunately, each type of model has limitations and collectively they can be inconsistent

Models can be more "actionable" and more closely tied to design decisions if they are based on behavioral and preference data and are interconnected

34 of 54

4/17/2008 3:05 PM

Modeling the User of a "Rear Seat Entertainment System" [Personas]

Kathleen is 33 yrs old and lives in Seattle. She's a stay-at-home mom with two children: Katie, 7, and Andrew, 4. She drives the kids to school (usually carpooling with 2-3 other kids) in her Volvo wagon. Kathleen is thinking about buying the Sony rear-seat entertainment system she saw last weekend at Best Buy to keep the children occupied on the upcoming trip to see family in Canada.

Modeling the User of a "Rear Seat Entertainment System" [Market Research]

...most respondents believed it was a "lifestyle" purchase for parents trying to entertain or distract their kids while driving. Most felt that the system was appropriate for children between the ages of 4-15yrs, as children needed to be old enough to use headsets as well as some form of remote control

Modeling the User of a "Rear Seat Entertainment System" [Use Cases]

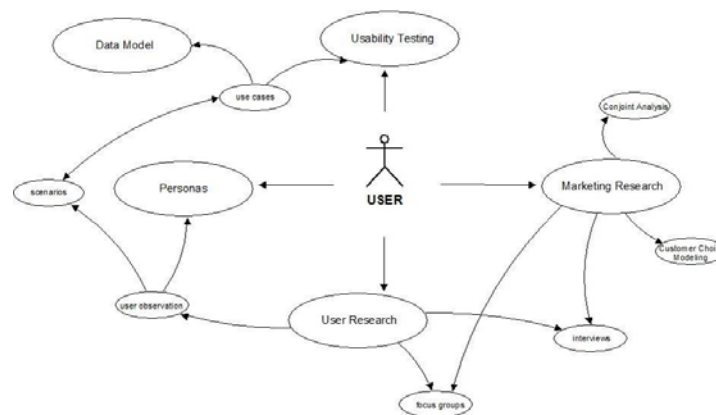
Driver/parent:

- . Turn on system
- . Turn off system
- . Set system controls
- . Adjust volume

Back seat passenger/child:

- . Change volume
- . Change channel

The Metamodel for User Models

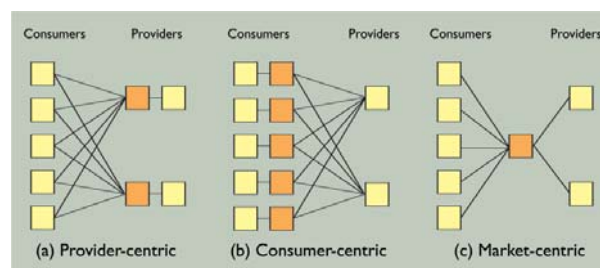


Who "Drives the Model" as a Service System Design Choice

The same model can often be driven or exploited by either the service provider or the service consumer; this is a design choice in the service system

- . 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

Adomavicius & Tuzhilin: "Architectures for Personalization"



"Customization" and "Personalization"

Customers want services that fit their individual needs

The ability to adapt in real time is a distinct advantage for providers who wish to be responsive to customer desires for individualized services

Some people reserve "customization" for activities initiated by the customer to tailor a product / service / experience; this is sometimes called "adaptable" customization

"Personalization" is initiated by the provider, and is sometimes called "adaptive" customization; one important difference is that not all provider-driven personalization is desired by the customer

In either case, a service designer needs to determine:

- . What information is required to modify the service?
- . Where can this information come from?

Where Does the Information Required for Personalization Come From?

From the consumer:

- . Surveys and forms
- . Transactional records
- . Behavioral records, navigation history

From data brokers, using keys obtained from the consumer

From other consumers who are similar to the target consumer

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 customer questions in a person-to-person encounter, or to fill out a self-service form?

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

Instead of either of these explicit customer interactions, can we use information we already have (from previous encounters, from other contexts, from aggregated business intelligence) to make it unnecessary to collect information from the customer?

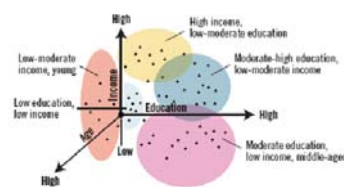
43 of 54

4/17/2008 3:05 PM

Bridging the Front Stage and Back Stage in Design (1)

file:///C:/Documents%20and%20Settings/glushko/My%20Documents/Lectures/210-F2007/21...

Descriptive Customer Models -- Identify Relations



Descriptive models can be used to categorize customers into different categories – which can be useful in setting strategies and targeting treatment.

Use: Find the relationships between customers

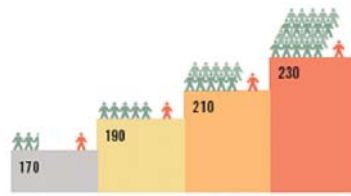
Example: Sort customers into groups with different buying profiles.

Operation: Analysis is generally done offline, but the results can be used in automated decisions – such as offering a given product to a specific customer

44 of 54

4/17/2008 3:05 PM

Predictive Customer Models -- Calculate Risk / Opportunity



Predictive models often rank-order individuals. For example, credit scores rank-order borrowers by their credit risk – the higher the score, the more “good” borrowers for every “bad” one.

Use: Identify the odds that a customer will take a specified action

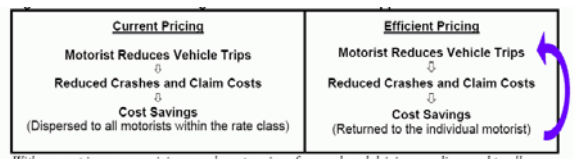
Example: Will the customer pay me back on time? Will the customer respond to this offer?

Operation: Models are called by a business rules engine to “score” an individual or transaction, often in real time

"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



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 use of flexible processes and organizational structures to produce varied and often individually customized products and services at the price of standardized, mass-produced alternatives"

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

These underlying architectures and combination rules for configurable products are often complex and difficult for customers to understand, so a configurator application supports the customer in building the appropriately customized product

We are just beginning to learn how these ideas apply to services

Model-Based UI and UX

It comes naturally to back stage designers to explicitly use models represented as UML class or sequence diagrams, database schemas, or XML schemas 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 for web browsers, cell phones, and voice systems with little of the 'hand-crafting' usually employed by front stage designers

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 alert those who had ordered the affected spinach and reassure those who had ordered unaffected spinach

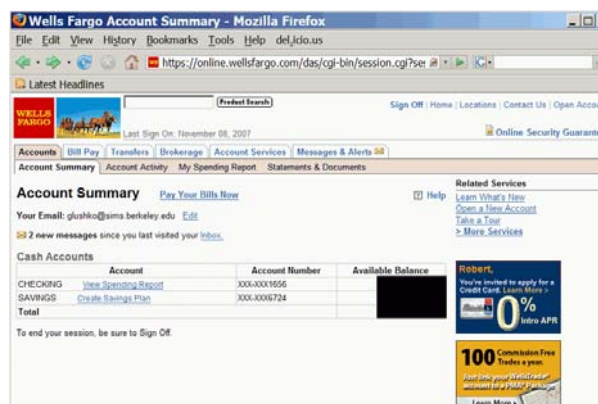
49 of 54

4/17/2008 3:05 PM

Bridging the Front Stage and Back Stage in Design (1)

file:///C:/Documents%20and%20Settings/glushko/My%20Documents/Lectures/210-F2007/21...

Personalized Banking... (More or less)



50 of 54

4/17/2008 3:05 PM

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

My monthly statement highlights any "out of pattern" transactions (that were not so "out of pattern" that the fraud detection system wouldn't authorize them)

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

Epilogue: The Information and Service Design Program

Established in 2007 to bring together diverse faculty with complementary interests at different levels of the "service design stack"

- . information modeling
- . systems analysis and design methods
- . implementation of "open" Web-based and mobile services and information-intensive applications
- . business architecture

Information Systems Clinic -- technology consultancy and instructional program providing project-based services to on campus and off campus organizations

Many new and revised courses

New Fall Course: Information Systems and Service Design

This course presents an end-to-end view of the design life cycle for information systems and services

It explains how design problems are conceived, researched, analyzed and resolved in different types of organizations and contexts, including start-ups, enterprises with legacy-systems, non-profit and government entities.

The course presents a framework for understanding and integrating the variety of design methods taught in more detail in other iSchool and MOT courses