12. Customer Modeling

8 October 2008

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Plan for ISSD Lecture #12

Understanding customer preferences

Models of "employees"

Models of "citizens" and "public sector customers"

One Minute MBA Moment -- Customer Preferences

"What business thinks it produces is not of first importance. What the customer thinks he is buying, what he considers value, is decisive. And what the customer buys and considers value is never a product. It is always utility, that is, what a product does for him" (Peter Drucker, "Management: Tasks, Responsibilities, Practice" [1974])

"Differentiation that does not drive customer preference is a liability" (Geoffrey Moore, "Darwin and the Demon: Innovation within Established Enterprises" [2004])

Why Model Preferences?

We want to design, build, deploy what people want

Different people or types of people want different things, or put different priorities on them

We can't do everything at once, so we must prioritize, and our priorities should reflect the priorities of our most important/valuable/influential customers

Learning About Customer Preferences

Direct observation... ethnography

Experimentation

Transaction data

Interviews

Focus groups

Surveys

Experimentation

In the "old days" and with tangible products, companies create different versions of a design and conduct experiments with customers to study preferences, usability, etc.

With web pages and "software as a service," it is qualitatively easier to run online experiments, and many firms run "continuous experiments"

- Show a different page layout to every hundredth visitor and determine in a few days whether the new design increases sales
- Try out a new search or ad placement algorithm and discover in a few hours whether results or ad "click-throughs" increase

Transaction Data

The "revolutionary" barcode technology, invented around 1950, was applied to library checkout starting in 1971 and grocery stores starting in 1974

Transaction data reveals "co-purchasing" patterns for products/services

When the customer can be identified, transaction data reveals preferences of buyers for particular products, enabling targeting to specific buyers or buyer categories

How easy it is to identify the customer depends on the context (online or offline) and on the customer's willingness to self-identify

Businesses use many techniques to identify the customer (some of which the customer might not know about or approve of)

Customer Surveys

Surveys are sometimes described as “structured conversations between strangers”

Businesses routinely ask customers about their preferences, and this is occasionally so they can provide better service or improve their products

Lots of methodology and lore about conducting surveys, but a very common technique is to ask people questions about their preferences for particular product/service features or dimensions

A Warning About Surveys

Questions can be misheard... and responses can be designed, consciously or unconsciously, to “solve” the cognitive tasks that the questions apparently pose ...

...to please or to impress the interviewer

...to support and to justify the self-image of the respondent

... to minimize effort and to hasten conclusion of the interview

...or to provide a forum for opinions and grievances

(Daniel McFadden et al., "Statistical Analysis of Choice Experiments and Surveys," Marketing Letters, 2005)

Survey Question Example

Please indicate how much you agree or disagree with each of these statements:

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The president is doing a good job.	1	2	3	4	5
The Congress is doing a good job.	1	2	3	4	5
The Secretary of Defense is doing a good job.	1	2	3	4	5

Likert Scales

The Likert Scale is very commonly used in survey questions to elicit preferences or evaluations

Typically use 5 or 7 level scale, usually with "symmetrical" labels

The choice of labels can bias the results, which are often "overinterpreted" as interval-level data when they are almost just ordinal data

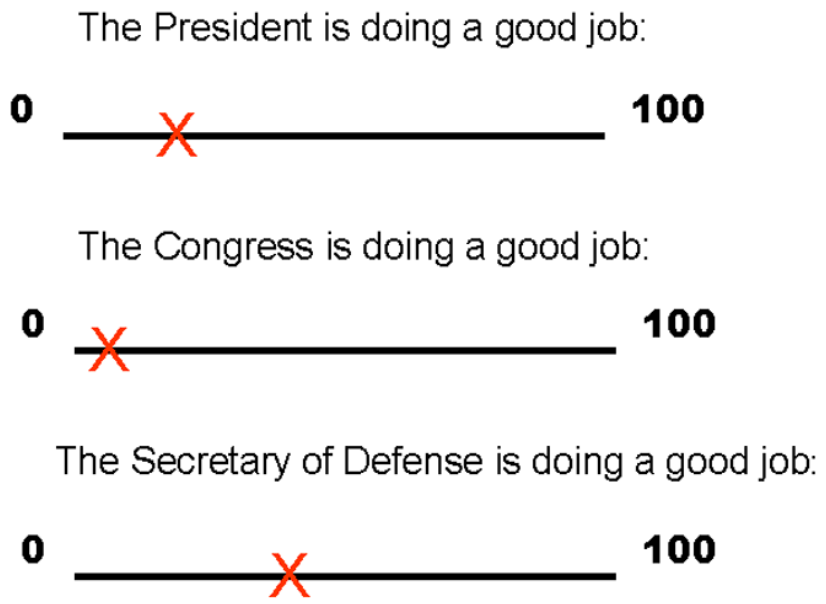
- Ordinal data: Bar charts, mode, median
- Interval data: Mean, standard deviation

Poor Survey Question Design

How often do you smoke cigarettes?

1. Never
2. Once in a while
3. 1-5 per day
4. More than 5 per day.

"Magnitude Estimation" in Surveys



Using "Magnitude Estimation" to Improve Data Quality

Asking people to make direct "magnitude estimates" on scales can improve survey data quality

This technique eliminates a substantial source of bias (that any ISchool student had better be able to explain...)

This technique yields metric data that can be analyzed with far more statistical rigor than is justified for traditional Likert-type surveys

Limitations of Unidimensional Preference Judgments [1]

Any survey technique that asks people to evaluate product or service dimensions has significant limitations

Why? Because these dimensions are bundled or combined in the actual products or services

The importance of any dimension depends on the values on other dimensions

Typical Dimensions of Multidimensional Preferences

Price

Features

Quality

Performance

Brand

Distribution Channel

Safety

Usability

...

But Every Design Context Has Additional Dimensions

What criteria or dimensions are considered when choosing:

- Courses to take next semester?
- Restaurant(s) to patronize?
- Restaurant(s) to patronize in an airport terminal?
- A personal physician?
- Someone to cut your hair?
- Where to go on vacation?
- A president?

Limitations of Unidimensional Preference Judgments [2]

When people are asked about one dimension at a time, they implicitly consider it in the context of a "bundle" in which all other values are acceptable

So they don't consider the tradeoffs that might be required, and their preferences tend to be overestimated

But some feature combinations just aren't feasible or affordable, and in reality they would need to make tradeoffs

New Techniques for Modeling Customer Choices

Discrete choice modeling - infer weights on preference dimensions or drivers using sophisticated statistical models

Invented by Daniel McFadden, Berkeley economics professor who won the 2000 Nobel Prize

Requires specialized software for generating combinations and extracting the preferences (e.g., Sawtooth Software)

DCA Methodology: Design

Identify relevant dimensions or "drivers" that influence preferences or buying decisions for a product or service

Determine the range or values on each dimension to be evaluated

Construct the items for "choice experiments" in which simulated "choice sets" are presented to representative participants (selected to reflect current or targeted customer segments)

Because of brilliant statistical and experimental design "black magic" the number of alternatives needed is a tiny fraction of the possible combinations

Constructing the Choice Sets: Existing Offerings

Constructing the Choice Sets: Hypothetical Offerings

	OPTION A
Online Customer Support	Online Chat (e.g. Messenger Chat)
Product / Service Descriptions	1 Picture & Short Description
Shopping Assistance	Typical Search Engine
Offline Customer Support	1-800 # only
Recommendations	No Recommendations
Loyalty Programs	Offers a % of money spent back at the end of the year
Payment Methods	Only accepts Credit Cards
Promotional / Reminders	Wish List with email reminders
Money Back Guarantee	Unconditional money back, no questions asked

	OPTION B
Online Customer Support	Audio Chat from computer (e.g. Skype, or MSN Instant Messenger)
Product / Service Descriptions	Brief Description & NO pictures
Shopping Assistance	Enhanced Search Capabilities: retrieves items based on past purchases and current preferences
Offline Customer Support	Can be reached by e-mail and 1-800 #
Recommendations	Customer Product/Service Ratings
Loyalty Programs	1 point for every $1 spent
Payment Methods	Accepts all payment types
Promotional / Reminders	Wish List without email reminders
Money Back Guarantee	Subject to company policies (time constraints, warranties, partial refunds)

DCA Methodology: The Customer's Task

The customer evaluates the simulated product/service offerings and:

- Indicates a preference between two proposals, or says that neither is acceptable
- Or, indicates a preference between an offering that the customer currently has and one or more simulated ones
- Or, marks one offering as the worst and one as the best

Comparing Current with Possible Choices

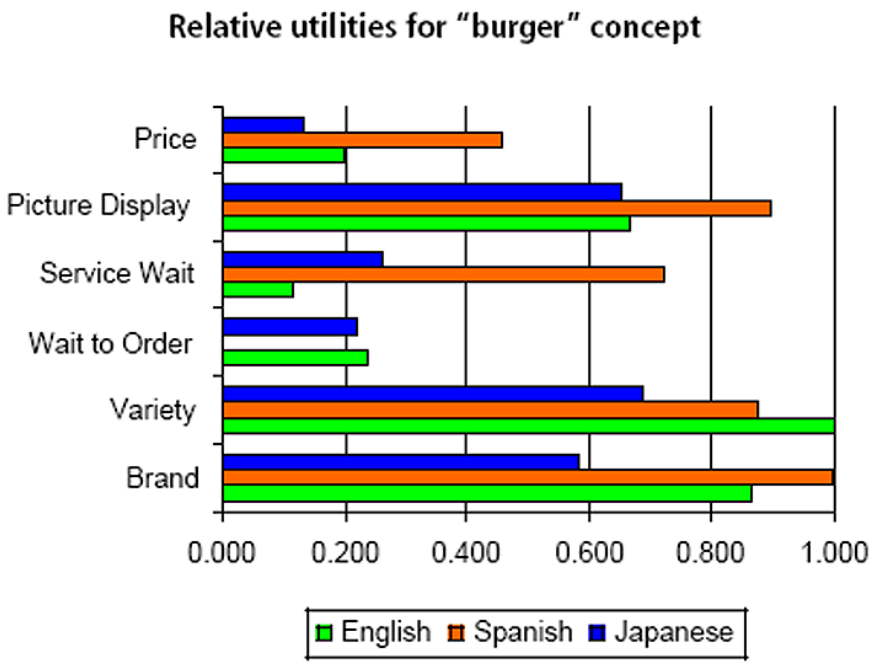
	Package A	Package B	Current Package
Phone Brand	LG	Samsung	Sharp
Phone Size	It will fit into a jeans pocket, but it is too bulky to fit in a shirt pocket	Size of an oversized credit card with ½ inch thickness	It is small enough to fit into a typical shirt or blouse pocket
Phone Design	Slide 	Swivel 	Monoblock 
Phone Functions (in addition to voice calls, voice mail, short messaging (e.g. SMS, MMS))	None	Business productivity tools (e.g., email, schedule)	Media tools (e.g., camera, music player, TV)
Phone Price	$ 250 or more	Between $ 100 and $ 149	Between $50 and $99
Wireless Carrier	Verizon Wireless	Nextel	Alternative carrier (e.g., MTV, Virgin Mobile, Boost)
Carrier Flexibility	Can be used with any other carrier of my choice	Can only be used with this carrier	Can be used with any other carrier of my choice
Phone Usage	Can be used in U.S. only	Can be used around the globe	Can be used around the globe
Purchase Location	Internet store/online	Department store (e.g., Macy's, J.C., Penney)	Wireless carrier retail store (e.g., Verizon, Sprint)
Which device package will you choose?	○	○	○

DCA Methodology: Analysis

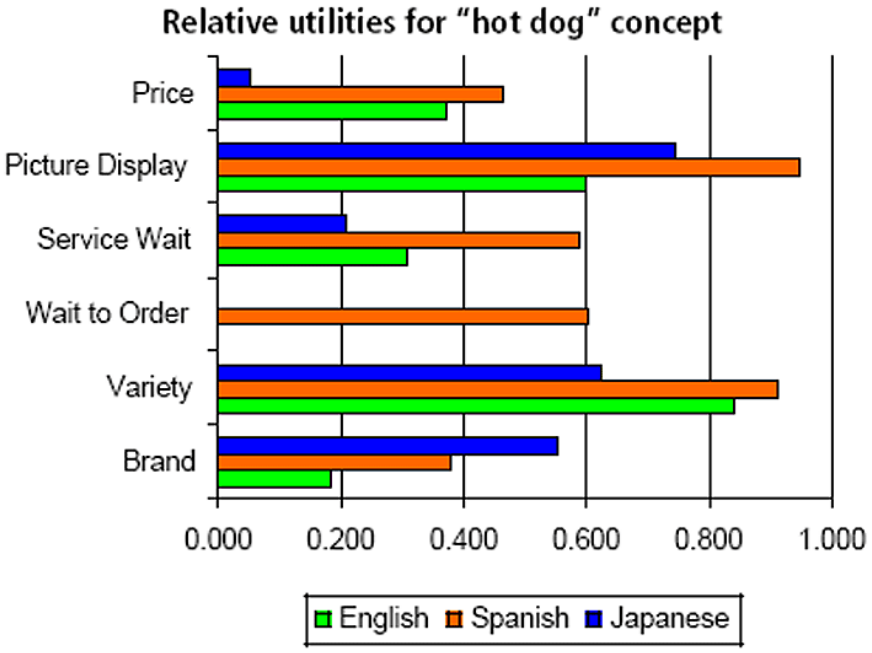
Analyze the preferences to determine the relative weight of the preference for each separate attribute

Respondents with similar preferences can be identified, and the characteristics or profile of these respondents can suggest a label for each customer segment

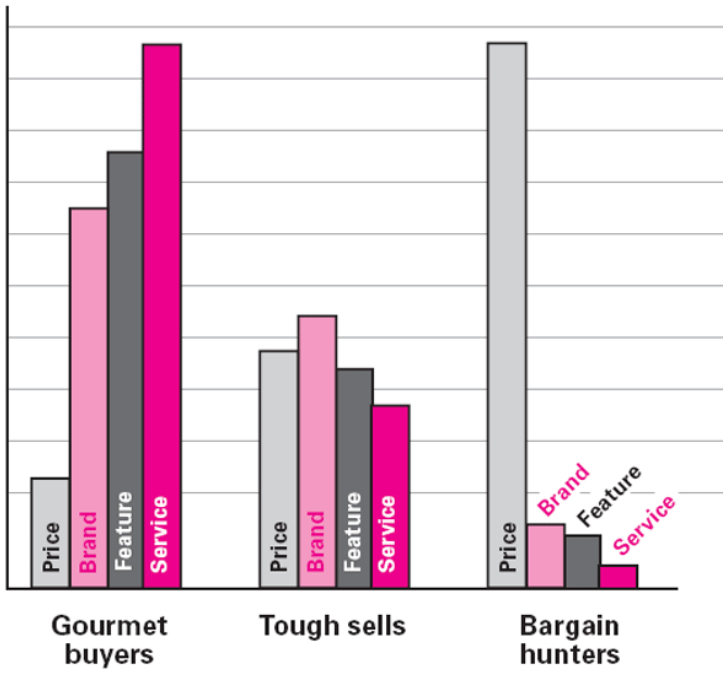
Demographic Segments x Choice Drivers [1]



Demographic Segments x Choice Drivers [2]



(Derived) Segments x Choice Drivers



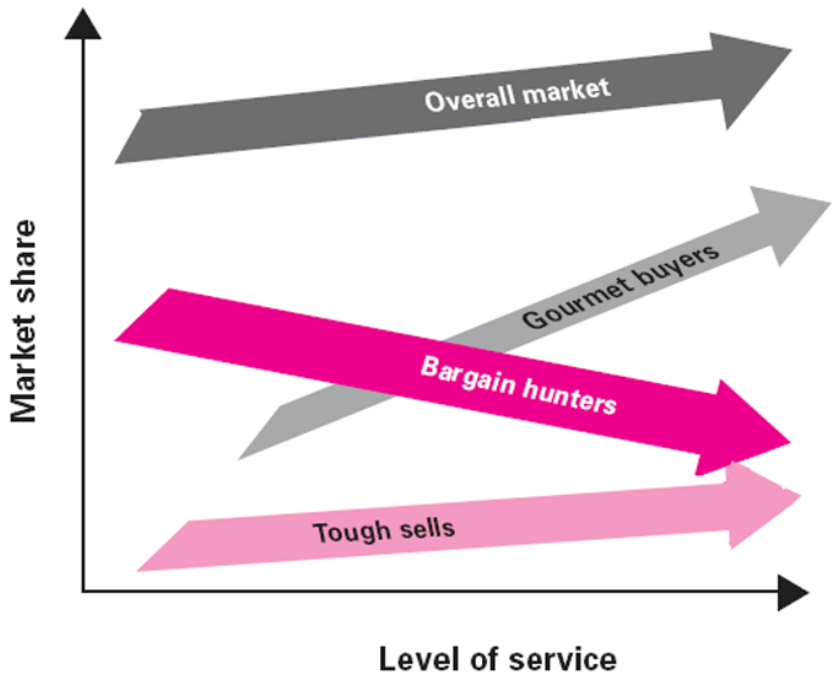
"Elasticity" of Preferences

How much does preference change when the value of some attribute changes?

This question is most often asked for the price dimension: how much do price changes affect a customer's willingness to buy something?

However, DCA techniques can assess the elasticity of preference on any dimension or driver used to generate alternatives

Segments, Sensitivity, & Market Share



One Minute MBA Moment -- Order Winners & Qualifiers

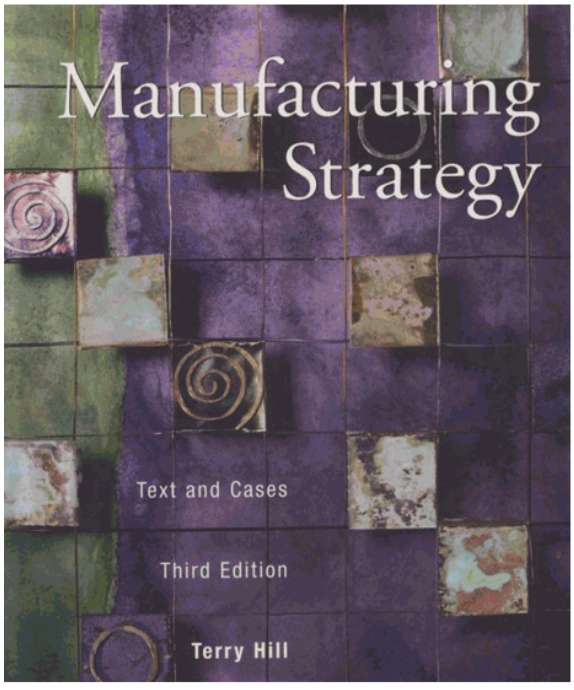
Some dimensions of products/services are more important than others with respect to your competition

Qualifiers are the minimum level on some dimension that your offering must reach for it to be considered a feasible candidate

Winners are the dimension that is most important to your targeted customers - so you have to excel at this

Qualifiers and winners are market and time-specific

"Manufacturing Strategy" - Terry Hill



The "operational" part of a firm must identify the "order winning" and "order qualifying" dimensions or capabilities that must be provided by the "manufacturing" part

Manufacturing must find ways to achieve the order winning capabilities without undermining the order qualifying ones

For example, if quality is "order winning" and price is "qualifying," manufacturing must focus on producing quality products at acceptable cost. But if price is winning and quality is qualifying, manufacturing's challenge is to cut costs while maintaining acceptable quality

Winners and Qualifiers in the US Auto Industry

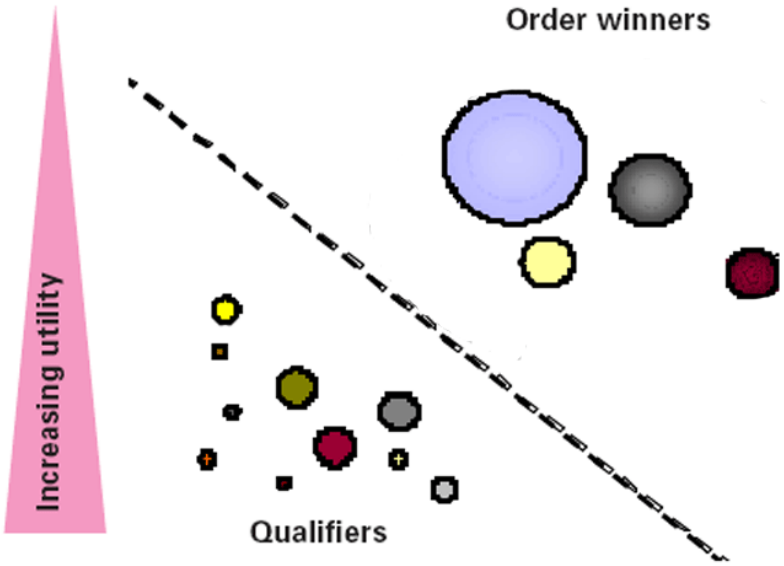
up to 1960s - order winner was price and length (big cars, reasonably priced)

1970s-80s - order winner became quality/reliability, and Japanese auto makers seized market share

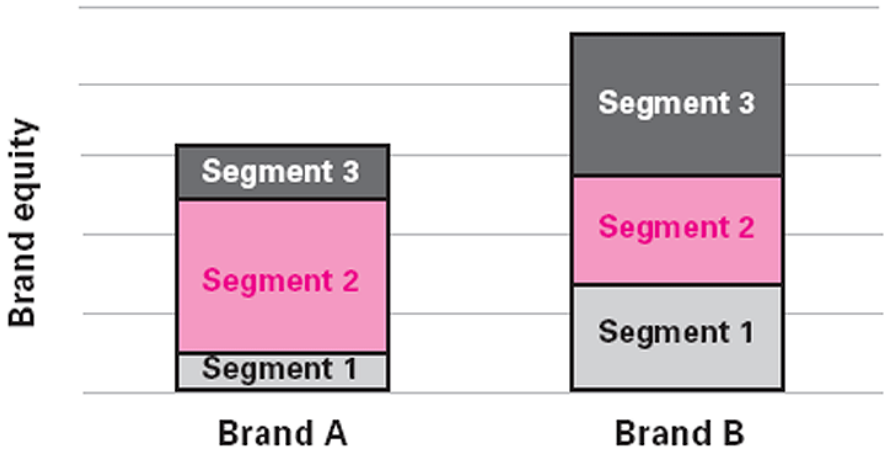
1990s - US cars achieved (enough) quality/reliability for it to become qualifier and not winner, so US market share stabilized

2000s - new order winner appears to be fuel efficiency, US makers losing market share to Japanese

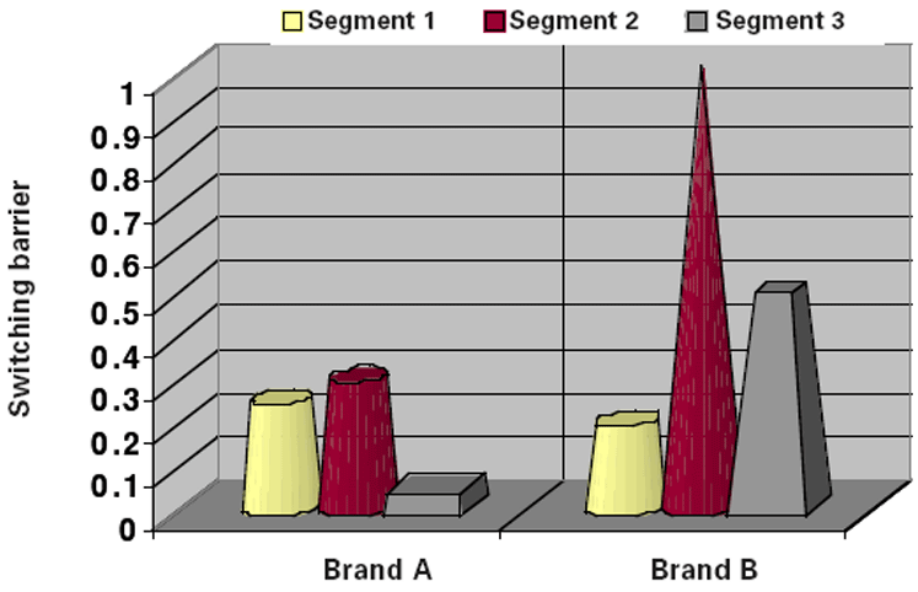
Order Winners and Qualifiers via DCA



Customer Segments and Brand Equity



Customer Segments and Switching Barriers



http://www.apple.com/getamac/ads/

Discussion: DCA {and,vs,or} Personas

Personas are hypotheses about customer segments that are used to inspire and evaluate product/service features

DCA techniques can identify customer segments with similar evaluations of product/service features

"Rich" simulation of products/services in DCA experiments can enhance their validity

DCA analysis can confirm, refine, or disconfirm the hypotheses embodied in personas

Personas and their associated stories can suggest goals, motivations, or explanations for the preferences revealed by DCA

Models of Employees

	Device availability	Employee mobility	Primary physical environment	Level of computer literacy	Alternative self-service channels
Desktop connected employees	At desktop	Low	Conducive to computer-related work	High	Personal computer access at home
Dispersed employees (e.g., convenience store)	Limited to point-of-sale (POS) systems or manager	Low	Shared space with customers	Varied	Fax machine; kiosk; personal computer access at home
Mobile employees (e.g., delivery personnel)	Personal computer usage limited to visits to home office/depot; access to mobile phones as part of the job	Constant movement between locations	Primarily in vehicle	Varied	Mobile telephone, personal computer access at home
Shop floor employees (e.g., assembly workers)	Personal computers may be available in home or break room; potential kiosk availability	Low	Production materials, noise and privacy issues may impact usage	Varied	Kiosk, personal computer access at home

"Field Engineer" Persona (by Elisa Oreglia)

John Shorter, Telecommunications Field Engineer for a big company

Description: John has worked for Company X as a field engineer for 10 years. He has an office, but never works there, as he's always on the road for work, and rarely has access to a computer. When he does so, he needs to catch up with work, and doesn't have time to do anything else, so he often takes care of personal business related to work from home. He is comfortable using technology at work and in his private life, but is concerned about security.

Goals:

- Access his employee profile (e.g. how many vacation days he has left, what's his pension fund status, etc) in different ways, from different places
- See changes in his employee status as soon as they are available
- Avoid having to remember a different set of passwords for different HR services

"Field Engineer" Persona (continued)

Challenges & Limitations

- doesn't have regular access to a networked PC at work
- is always on the road, so may not have prompt access to specific documents
- has regular access to his cell phone, but needs to be able to use SMS or voice depending on how much privacy he gets

Would like:

- to use his cell phone and home computer to access the company HR services
- asynchronous communication with HR, which leaves him time to react to the information he receives

"Field Engineer" Scenario 1

By using the text messaging feature on his phone, he types in “Vacation Status” and sends it to a corporate account. A few seconds later, he is prompted for a password, which he then supplies. Several seconds later, he receives a short message, detailing his available vacation days, carry-over days and the days that must be used by the end of the year

"Field Engineer" Scenario 2

He is seeking a loan from his retirement account. He sends an e-mail message from a home account to an HR e-mail address.

- Use case A: An automatic e-mail response system routes his request to a service center employee, who sends him an SMS asking what is the best time to call him back to discuss the issue
- Use case B: An automatic e-mail response system drafts an automatic response to his inquiry. In this response, he could be provided with a list of FAQs about loan procedures, the appropriate forms he would need to complete, or a link to guide him to the appropriate section of a Web site where he could complete his processing online.

Models of Citizens

let's brainstorm some personas

Readings for 13 October

Mary Jo Bitner, Amy Ostrom, & Felicia Morgan, “Service blueprinting: A practical technique for service innovation.” California Management Review, Spring 2008.

Chris Voss & Leonieke Zomerdijk, “Innovation in Experiential Services: An empirical view” (pages 97-113)