

27. Personalization and Customization

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Plan for Today's Lecture

- Defining/distinguishing personalization and customization
- Empowering personalization in person-to-person encounters
- Empowering with information
- Modeling for personalization
- Recommendation systems
- Architectures for personalization

Motivating "Personalization" and "Customization"

Customers want products and services that fit their individual needs in as specific a way as possible ... why?

Providers usually segment the population of potential customers for their products and services, but would prefer to meet the specific needs of individual customers... why?

Distinguishing "Personalization" and "Customization"

Some authors treat P & C as synonyms: "Personalization is the capacity to customize..."

Others don't use "customization" at all, but distinguish "user-initiated personalization" and "system-initiated personalization" (Cranor)

Others don't use "personalization" at all, but distinguish "adaptable" (customer-initiated) customization from "adaptive" customization (provider driven)

One clear difference is that not all provider-driven personalization is desired by the customer

Personalization that Customers Don't Want

Price discrimination

Use of personal information obtained in one context to personalize other ones (incorrectly, or without permission)

Unsolicited targeted marketing

Exposure to legal actions

Tailoring Products to Individual Preferences

Many product types (clothing, furniture, appliances) can be produced in a range of sizes, colors, materials, etc. so that customers can select an offering that fits their individual requirements

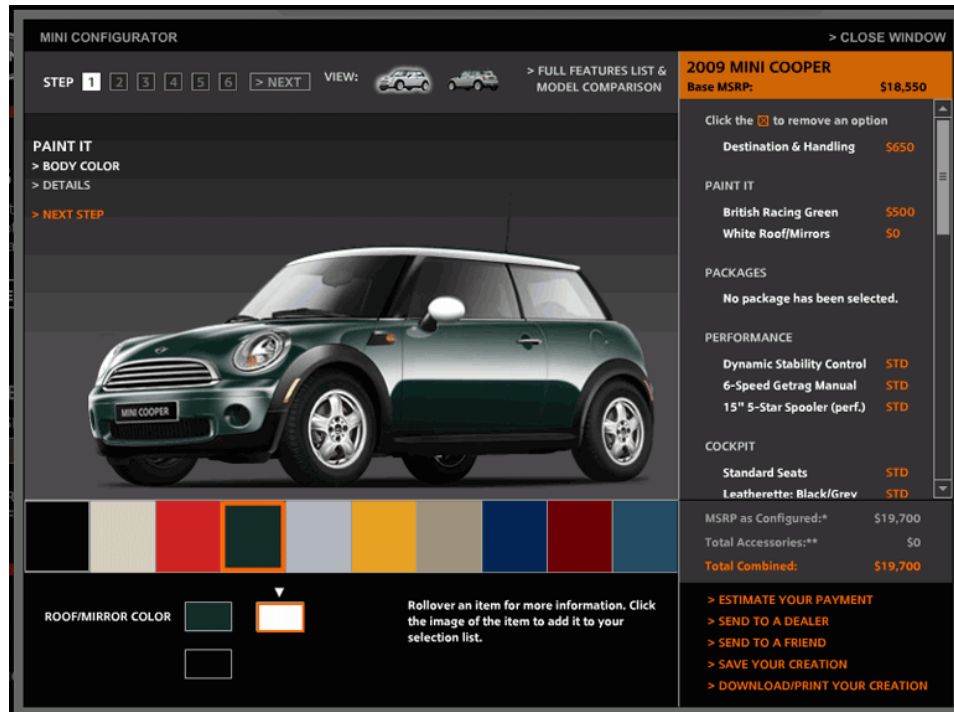
These products aren't personalized, but if the range of standard offerings is broad enough, the customer might be able to select one that satisfies his individual preferences

But this "build to stock" approach isn't feasible for some product types, and increasing global competition makes it harder to compete on the basis of standard products

...leading to other approaches:

- Configure to order: standard products are offered in predefined product configurations
- Assemble to order: standard components are assembled according to customer specifications
- Engineer to order: new products are designed to meet customer specifications

BTO Mini-Cooper (miniusa.com)



"Mass Customization"

The goal of "Mass Customization" for product manufacturers was first proposed by Pine in 1993

"Using flexible processes and organizational structures geared to producing varied and individually customized products and services at the low cost of a standardized, mass production system"

The "trick" is to determine the range within something can be meaningfully differentiated from a customer perspective, and then to facilitate the choice of options within that range

Strategy is most successful in fragmented, niche markets

Must be careful not to overwhelm customers with too many choices and must set expectations about time and cost to customize

(Ideas were overgeneralized to services in 1999 book "Experience Economy")

Mass Customization in Services

Many services are information-intensive, and full customization "would call for uneconomical resources of insurance mathematicians, lawyers, etc."

Similarly, high-volume services like mobile and broadband subscriptions can't be individually modified because they are delivered on automatic platforms

Tihonen et al. apply mass customization approach of "configurator" to service contracts

Configurable Contractual Service Dimensions

Pricing scheme - One-time, recurring, and pay-by-use

Information and reporting - Scope of information and reports available to customer

Paying and billing - Number of payments, due dates, paper-based vs electronic billing, etc.

Service quality - Basic contracts may not guarantee as much availability as higher-level contracts (SEE SLA discussions in lecture on 11/24)

Tailoring Systems and Services to Individual Preferences

Perhaps paradoxically, people often think that services and systems -- because they are less tangible -- should be more tailorable than products

In particular, most consumers of person-to-person services expect some flexibility or customization because limited choices can give a service a transactional and “take it or leave it” character that customers perceive as a low quality experience

Likewise, most consumers of interactive/automated services expect some flexibility or customization because they assume that the software that drives them is a more malleable design medium than the physical materials used to make products

Tailorable Aspects of Systems and Services (Offline and Online)

Selection and quality of offerings

Product and service recommendations

Prices

"Empowering" The "Contact" Employee

Providers of person-to-person services often “empower” the service provider/contact employee to adapt the service to satisfy customers

The contact employee can provide additional services to solve problems or handle unexpected events, or just so that the customer can “have it his way”

This view treats variability in service delivery as inevitable and perhaps even desirable

The Hotel Service Encounter



"Empowered" Hotel Check-In: Success

RECEPTION EMPLOYEE: Welcome, Dr. Johnson, it is good to see you again. We know you like room 321, the corner room with the bridge view, so we've reserved it 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.

"Empowered" Failure

RECEPTION EMPLOYEE: Your name, sir?

CUSTOMER: Johnson

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 online booking confirmation page.

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...

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.

"Empowering" Employees Is Necessary but Insufficient

The empowered reception employee is using institutional knowledge about customer room and entertainment preferences

At hotels that pride themselves for high quality service, employees are incentivized to record this kind of information so that it can be used to personalize customer experiences

But this information is managed in back stage applications, and if it isn't there, empowerment alone can't satisfy the customer

Empowering with Information

Any request made by a Four Seasons or Ritz-Carlton customer is recorded, and thus is available at any hotel in each chain

Implicit requests are also recorded -- which fruits a guest eats from a fruit basket, so that future baskets contain only preferred fruits

So the hotel can personalize, and the customer never has to ask more than once: the Ritz-Carlton Hotel Company's credo is to "fulfill even the unexpressed wishes and needs of our guests"

Employees are expected to demonstrate some aspect of "personalization" in every service encounter

(a)Symmetric Tailoring in Multichannel Services?

What information about a customer's activities in an online channel can be recorded?

How can this information be used to provide better functionality or service in the online channel? in the physical channel?

What information about a customer's activities in a physical bricks and mortar can be recorded?

How can this information be used to provide better functionality or service in the physical channel? in the online channel?

Additional Tailorable Aspects of the Online Experience

Content (terms and conditions, localization, reading level)

Links

Advertisements

Search results

Personalization at Amazon.com



Personalization at Amazon.com

Hello Robert J. Glushko

Recommended for you...

Recently viewed items...

Customers who bought...

Your favorite authors...

Rate these items...

Payment methods

Address book

...

Personalization Methods

Dynamic or session-based (real-time, perhaps one-time)

Profile or model-based (durable)

Go to [google.com/patents](https://www.google.com/patents) and search for:

- ecommerce personalization
- personalized recommendations
- dynamic pricing

Some Amazon Patents

Content personalization based on actions performed during a current browsing session (#6,853,982)

- Various methods are disclosed for monitoring user browsing activities, and for using such information to provide session-specific item recommendations to users. In one embodiment, a monitoring component of a merchant's Web site maintains a record of products viewed by each user during a current browsing session--preferably based on visits to product detail pages

Personalized recommendations of items represented within a database (#7113917)

- A computer-implemented service recommends items to a user based on items previously selected by the user, such as items previously purchased, viewed, or placed in an electronic shopping cart by the user

Use of product viewing histories of users to identify related products (#6912505)

- Various methods are disclosed for monitoring user browsing activities that indicate user interests in particular products or other items, and for using such information to identify items that are related to one another

Freshdirect

The screenshot shows the FreshDirect website interface. At the top, there are links for "New customer? Sign Up" and "Current customer? Log In". Below this is the FreshDirect logo and a search bar with a "FIND" button. Navigation icons include "VIEW CART", "CHECK OUT", "DELIVERY INFO", "QUICK SHOP", "YOUR ACCOUNT", and "GET HELP". A horizontal menu lists categories: "FRUIT · VEGETABLES · MEAT · SEAFOOD · DELI · CHEESE · DAIRY", "4-MINUTE MEALS · READY TO COOK · HEAT & EAT · BAKERY · CATERING", "ORGANIC · LOCAL · KOSHER · OUR PICKS · RECIPES", and "COFFEE · GROCERY · HEALTH & BEAUTY · BUY BIG · FROZEN · WINE".

The main content area features a banner for "OUR ORGANIC & ALL-NATURAL MARKET" with the text "We're proud to feature our selection of earth-friendly organic and all-natural foods." Below this are several product category tiles with images and labels: "Fruit", "Vegetables", "Meat & Seafood", "Deli Meats", "Heat & Eat", "Dairy", "Grocery", "Coffee & Tea", "Frozen", "Beverages", "Baby", "Snacks", "Health & Beauty", and "Organic Wine from Union Square Wine & Spirits".

On the right side, there is a "PRESIDENT'S PICKS" section with a five-star rating and the headline "AN ABUSE OF PRICE POWER". Below this is a "YOUR CART" section showing a "Subtotal: \$0.00" and a "VIEW CART" button. A "Check Out" button is also visible.

Model-based UIs Personalized at Run Time

Fresh Direct (<http://www.freshdirect.com>) 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

Personalized Banking... (More or less)

The screenshot shows a web browser window titled "Wells Fargo Account Summary - Mozilla Firefox". The address bar displays the URL "https://online.wellsfargo.com/das/cgi-bin/session.cgi?se:". The page content includes a navigation menu with options like "Accounts", "Bill Pay", "Transfers", "Brokerage", "Account Services", and "Messages & Alerts". The main heading is "Account Summary" with a sub-link "Pay Your Bills Now". Below this, there is a table of "Cash Accounts" with columns for "Account", "Account Number", and "Available Balance". The table lists a "CHECKING" account with number "XXX-XXX1656" and a "SAVINGS" account with number "XXX-XXX6724". To the right of the table, there are promotional banners for a credit card and a "100 Commission Free Trades a year" offer. The page also features a "Product Search" bar and a "Sign Off" link.

Account	Account Number	Available Balance
CHECKING View Spending Report	XXX-XXX1656	
SAVINGS Create Savings Plan	XXX-XXX6724	
Total		

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)

Modeling for Personalization

The information provided explicitly or implicitly by the consumer can be used to build a model or profile

This "model" can be trivial - like the set of "cookies" from previously visited sites, and simple "been there before" information can be used to personalize

Or it can be much more sophisticated and robust, based not just on a single customer but on other consumers who are similar to the target consumer

What Information is Needed to Personalize?

"Who the customers are and how they behave"

"Demographic and psychographic information"

"Comprehensive information... converted into actionable knowledge"

Where Does the Information Required for Personalization Come From?

Explicit Sources

- Surveys, forms, etc - preferences and ratings
- From data brokers, using keys provided by the consumer

Implicit sources

- Transactional records
- Behavioral records, navigation history

Explicit Preferences

Fill out a form to state preferences

Rate items on some scale to facilitate statistical processing

Are expert preferences worth more than those by ordinary users?

Does the effort required to make explicit ratings create free-rider problems?

Implicit Preferences

Collecting implicit ratings eliminates some of the problems with explicit ones

Actions like "reply," "save," "copy," "bookmark," "link to" etc indicate interest in a message or document

Buying something indicates you like it

Other implicit preference data?

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?

Some guidance should come from emerging design philosophies that emphasize "lean consumption" (Womack and Jones 2005) and "consumability" (Kessler and Sweitzer 2008), which seek to eliminate all customer interactions and encounters that add no value.

Data Mining

Data mining is a generic term for the collection of analysis techniques used to infer rules from or build models from large data sets

There are two distinct goals in data mining - knowledge discovery (or learning) and prediction

Knowledge discovery identifies association rules between one data item and another (like the tendency to purchase together or in a predictable temporal sequence)

A human analyst is usually involved to determine which associations are exploitable

Some association rules can be directly applied (e.g., in store layout)

Other rules are implemented in predictive models (including recommendation systems)

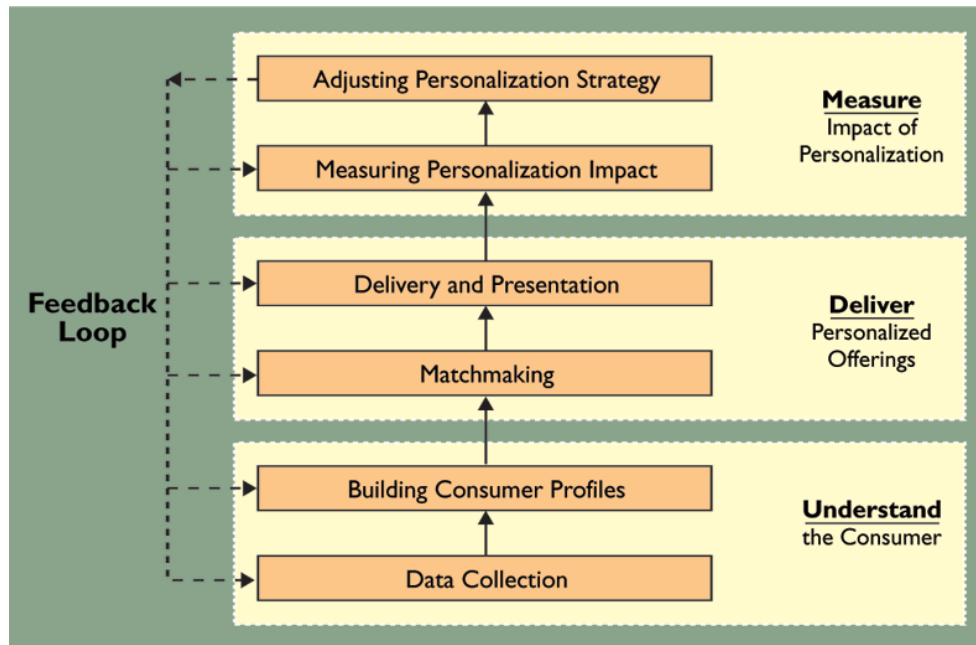
Building a Customer Profile with Data Mining

Factual	CustomerId	LastName	FirstName	BirthDate	Gender
	0721134	Doe	John	11/17/1945	Male
	0721168	Brown	Jane	05/20/1963	Female
	0730021	Adams	Robert	06/02/1959	Male

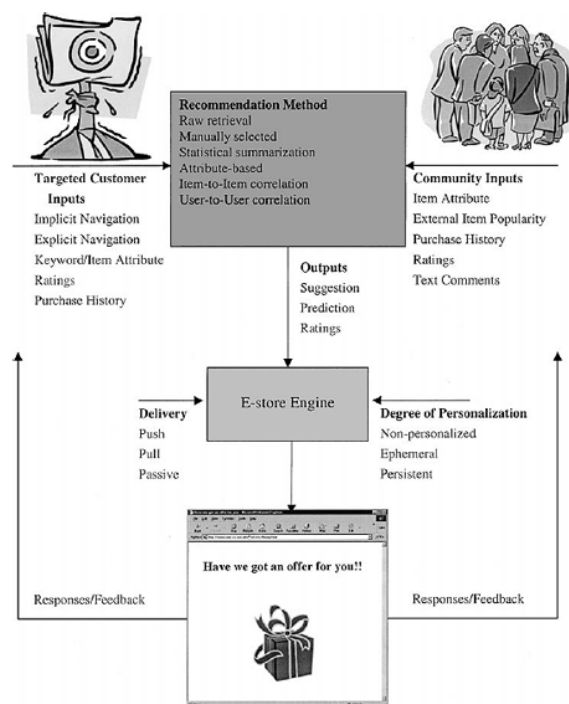
Transactional	CustomerId	Date	Time	Store	Product	CouponUsed
	0721134	07/09/1993	10:18am	GrandUnion	WheatBread	No
	0721134	07/09/1993	10:18am	GrandUnion	AppleJuice	Yes
	0721168	07/10/1993	10:29am	Edwards	SourCream	No
	0721134	07/10/1993	07:02pm	RiteAid	LemonJuice	No
	0730021	07/10/1993	08:34pm	Edwards	SkimMilk	No
	0730021	07/10/1993	08:34pm	Edwards	AppleJuice	No
	0721168	07/12/1993	01:13pm	GrandUnion	BabyDiapers	Yes
	0730021	07/12/1993	01:13pm	GrandUnion	WheatBread	No

Discovered rules (for John Doe)	
(1) Product = LemonJuice => Store = RiteAid (2.4%, 95%)	
(2) Product = WheatBread => Store = GrandUnion (3%, 88%)	
(3) Product = AppleJuice => CouponUsed = YES (2%, 60%)	
(4) TimeOfDay = Morning => DayOfWeek = Saturday (4%, 77%)	
(5) TimeOfWeek = Weekend & Product = OrangeJuice => Quantity = Big (2%, 75%)	
(6) Product = BabyDiapers => DayOfWeek = Monday (0.8%, 61%)	
(7) Product = BabyDiapers & CouponUsed = YES => Quantity = Big (2.5%, 67%)	

Personalization Process (Adomavicius & Tuzhilin)



Recommendation Systems



Item Recommendation

The most intuitive way to get an item recommendation is by "word of mouth" from people who have similar preferences






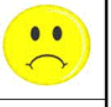
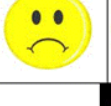




There are numerous algorithms for identifying these "nearest neighbors" or "consumer clusters"

But it is more common to base recommendations on the similarity from the "item side" rather than the customer side

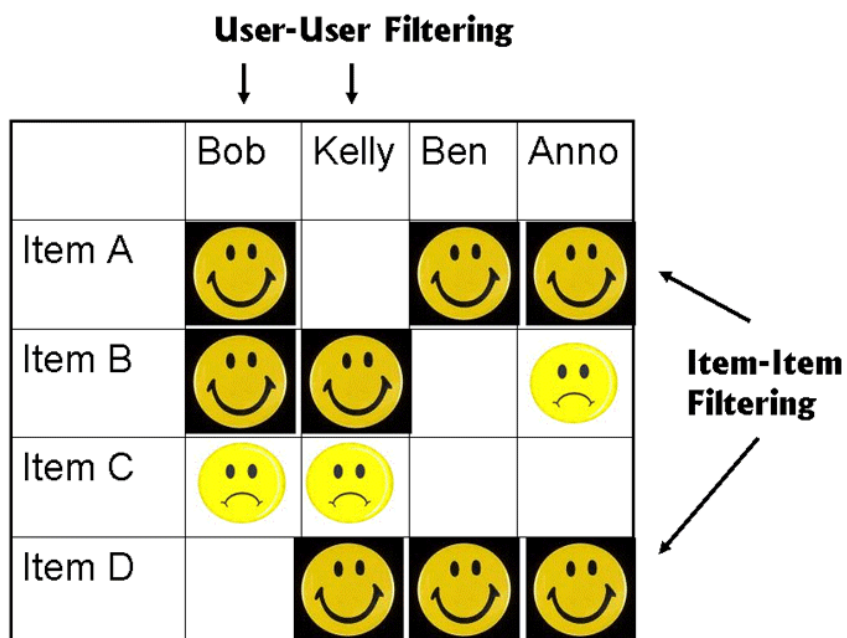
User-User and Item-Item Filtering

User-User Filtering

↓ ↓

	Bob	Kelly	Ben	Anno
Item A				
Item B				
Item C				
Item D				

Item-Item Filtering



User-User Collaborative Filtering

Principle: Find users with similar preferences and listen to their "word of mouth"

Bob and Kelly agree on Item B and C

So Bob's preference for A gets recommended to Kelly, and Kelly's recommendation for D gets recommended to Bob

Item-Item Collaborative Filtering

Principle: Find items with similar appeal

Item A and Item D are both preferred by Ben and Anno

So if people who like D also like A, then A can be recommended to Kelly, who likes D

Limitations on Collaborative Filtering

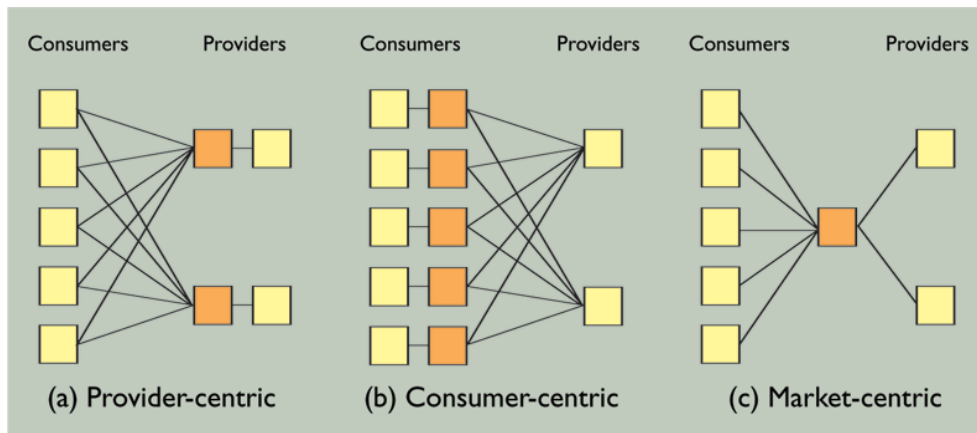
Privacy concerns

Recommendation "spam" and dishonest ratings

Variability and preference change

Lack of "context sensitivity"

Architectures for Personalization



Architectures for Personalization

Adomavicius & Tuzhilin describe three architectures for personalization

They contrast them topologically in terms of where the "personalization engine" is located in the service system

It is also helpful to contrast on the basis of which side of the provider-consumer relationship initiates and controls the personalization

Implications for privacy?

Readings for 12/3

Christopher Meyer & Andre Schwager, "Understanding customer experience." Harvard Business Review, February 2007.

Sean R. Collins, Peter W. Dahlstrom, & Marc Singer "Profiting from proliferation" McKinsey Quarterly

"Future directions in building customer loyalty" Edgar, Dunn amp; Company, March 2007