

Sixth CU-Boulder Choice Symposium
June 4-8, 2004

MODELING CUSTOMER INTERACTIONS with an INTERNET RETAILER

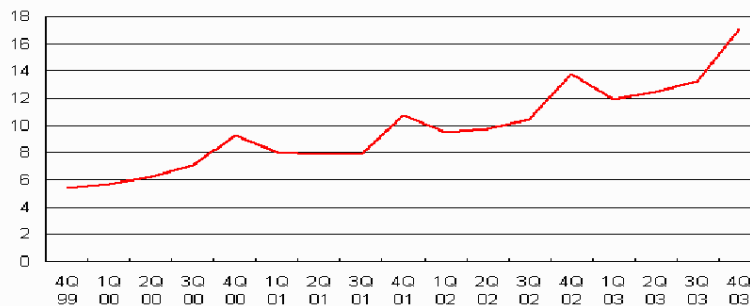
all the challenges you could possibly want

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MIT Sloan School

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US e-COMMERCE SALES

4th Quarter 1999 – 4th Quarter 2003
sales in billions of dollars
(unadjusted for seasonality)



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AGENDA

- Motivation
- Focus
- Organizing concept
- The shopping experience
- Needed models
- Challenges
- A framework

MOTIVATION

- * Every response to a customer click must be programmed
- * Decision rules and models are required
- * What data should be collected?
- * What rules should be developed?

How can academic knowledge contribute to better outcomes for retailer and customer?

MOTIVATION (cont.)

Smith's (2000) game theory analysis of internet booksellers concludes:

- * major branded booksellers will tacitly collude**
- * the others will adopt mixed high/low pricing**
- * these predictions "compare well" to actual pricing behavior**

But this type of research doesn't make detailed price recommendations.

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A FOCUS

The adaptive control of the marketing mix over time

- * what specific prices (and values of other marketing mix variables) should be set?**
- * how should these be changed so as to be effective yet learn how to do better**

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ORGANIZING CONCEPT

Build a WORKBENCH

- follow simulated visitors through shopping process
- base it on a simplified site
- be able to expand detail on an item of interest

Components

- models of customer choice
- models of site pages
- business models of site owners
- feedback control systems

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What is the Customer's Shopping Experience? A Focus Group

- * Think of a specific product you have bought on the web
- * What steps did you go through in buying it?
- * What was easy/hard?
- * What did you like/dislike?
- * How could the experience be improved?

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STAGES OF CONSUMER DECISION MAKING

Stage 1: Learn product's attributes

Stage 2: Construct importances for them

**Stage 3: Select a few products for
detailed consideration**

Stage 4: Evaluate products and choose one

**Needed: simple models
that capture the essence of these activities**

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Note: discussion session at conference stopped here.

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PRODUCT ADVISORS

- * Work through the product decision process with the customer
- * Example:
General Motors www.autochoiceadvisor.com

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The screenshot shows the home page of the Auto Choice Advisor website. At the top, there is a navigation bar with the logo "Auto Choice Advisor" and a menu with links: Introduction, Reset, Open, Save, About This Site, Give Us Your Feedback, and Our Privacy Policy. Below the navigation bar is a horizontal menu with six icons and labels: "My New" (How To Use It), "My Price Range", "My Colors, I Like", "My Brands, I Like", "My Features, I Like", and "My Event, I Like". The main content area features a "Welcome to Auto Choice Advisor!" message with a "START!" button. Below this, there is a light blue box containing text: "Discover which vehicles are right for you from over 250 different makes and models. Your unbiased list of vehicles is based on your preferences and years of consumer input. We provide this service to help consumers and gain insight on how we can improve our own products. To begin click one of the six 'Topic' buttons, the 'Vehicles Like This' button, or click 'START!'". A "Tell Me More" link is also present. At the bottom, there are logos for "Brought to you by: GM", "Content provided by: AIC", "Content provided by: J.D. POWER", and "Privacy Policy: Please view our revised privacy policy."

Home page of General Motors
www.autochoiceadvisor.com

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Models of Site Pages

Challenge:

There can be over 100 links to choose from on a home page. Each is a possible click.

How can this be simplified to make the analysis manageable yet be able to add selective detail when needed?

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The screenshot shows the BizRate shopping search website. At the top, there is a navigation bar with categories: Welcome, Electronics, Computers & Software, Home & Garden, Clothing & Accessories, Travel & Leisure, DVD/Video, Music, Gifts, Flowers & Food, Special Offers, Store Ratings, and See All Departments. A date indicator shows "March 16, 2004" and links for "Log in to your account" and "Help". A large banner for "Spring Sale" offers "Up to 50% Off Our Best Sellers". Below the banner is a search bar with "Search for" and "Go!" buttons. A "Browse" sidebar on the left lists categories: What's Hot, Appliances, Automotive, Babies & Kids, Books & Magazines, Clothing, Computers & Software, and DVDs & Videos. The main content area features a "Save Big, Shop Smart!" headline and a "Top Sellers" section. The top seller is the Canon PowerShot S400, with a rating of 4.5 stars, found at 204 stores, and a lowest price of \$281.00. The second top seller is the Fuji FinePix S5000, with a rating of 4.5 stars, found at 114 stores, and a lowest price of \$245.00. A "Sci-Fi DVDs & Videos" section promotes "Pre-Order Now! Lord of the Rings: The Return of the King". On the right, an AMD Athlon FX advertisement offers a "FREE 6-in-1 media RW with any AMD Athlon 64 FX purchase!". The footer shows a status bar with "Document Done (5.883 sec)".

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- Electronics**
Digital Cameras, PDAs, TVs, More...
- Gifts, Flowers & Food**
Perfume and Cologne, Home Gifts, Flowers & Plants, More...
- Health & Beauty**
Perfume and Cologne, Skin Care, Cosmetics, Mature, More...
- Home & Garden**
Furniture, Bedding, Appliances, More...
- Jewelry & Watches**
Watches, Rings, Bracelets, More...
- Music**
R&B/Hip Hop & Rap, Rock & Pop, Soundtracks, More...
- Musical Instruments**
Guitars/Basses, Drums/Percussion, Keyboards/Midi, More...
- Office Supplies**
Printers, Ink & Toner, Office Basics, More...
- Pet Supplies**
Birds, Cats, Dogs, More...
- Sports & Outdoors**
Camping & Hiking, Binoculars & Telescopes, Bicycles & Equipment, More...
- Toys & Games**
Costumes, Action Figures, Dolls, More...
- Video Games**
Video Games, Consoles, Accessories, More...
- Travel & Leisure**
Airline Tickets, Cruises, Hotels & Resorts, More...
- Services**
Insurance Quotes, Credit Cards, Tickets, ISP, Dating
Online Casino, Credit Report, Debt Consolidation, Mortgages
Cell Phones, Web Hosting, Domain Registration, More...



Rating: —
Found at: **6 stores**
Lowest price: **\$17.27**

▼ **Digital Cameras**



Canon EOS Rebel 300D (Body Only)
SLR - 6.3 Megapixels - Compact Flash, Microdrive
Compatible - Screen: 1.8 in - Focus: Automatic, Man
Rating: ★★★★★
Found at: **89 stores**
Lowest price: **\$719.99**

▼ **Television (TV)**



Sony Wega KV36XBR800
Regular TV - 36 in - HDTV Ready - Widescreen
(16:9)
Rating: ★★★★★
Found at: **13 stores**
Lowest price: **\$275.00**

▼ **Laptop Computers**



Super Talent M3N
Pentium M - 1.7 GHz - 1 GB HD - DVD-RW - 14 in
Image Not Available
Rating: ★★★★★
Found at: **5 stores**
Lowest price: **\$142.63**

▼ **Computer Printers**



CANON i860
Inkjet - USB - Color, Black & White
Rating: ★★★★★
Found at: **93 stores**
Lowest price: **\$123.71**

▼ **Computer Motherboards**



ASUS socket 478 P4P800 Deluxe
ATX - Intel 865PE - ATA 100/EIDE - Pentium
4/Celeron
Rating: ★★★★★
Found at: **88 stores**

Click now for today's deal

Who were the "best of the best" online stores this year?

BizRate Holiday2003

- Other Browse Options**
- [Related Searches](#)
 - [Free Shipping Offers](#)
 - [Win up to \\$25 today!](#)
 - [Recently Viewed Items](#)

- Featured Departments**
- [BizRate.com Logo Store](#)
 - Father's Day Gifts for Him**
Spoil your dad with a great gift for Father's Day
 - Mother's Day Gifts for Her**
Shower her with gifts she will love for Mother's Day!



Lowest price: **\$119.99**

▼ **Camcorders**



Sony Handycam DCR-TRV33
MiniDV - CCDs: 1 - 110 X Optical Zoom - 120 X
Digital Zoom - Digital Image Stabilization - Viewfind
Rating: ★★★★★
Found at: **65 stores**
Lowest price: **\$429.00**

▼ **Computer Monitors**



Nec MultiSync LCD1850X
Flat Panel - 15 in, 18 in - 1280 X 1024 Pixels - Dot
Pitch: 0.29 mm
Rating: ★★★★★
Found at: **95 stores**
Lowest price: **\$185.95**

▼ **MP3 Players**



Apple iPod 2nd Gen. 20 GB
FireWire (IEEE 1394) - Hard Drive - Mac, PC - Avg.
Playback: 20 h - Formats: MP3, WMA
Found at: **14 stores**
Lowest price: **\$229.99**

▼ **PDA & Handheld Computers**



PALM Tungsten E
32 MB - 126 MHz - Palm OS 5.2.1 - 16-Bit (64K
Colors)
Rating: ★★★★★
Found at: **47 stores**
Lowest price: **\$167.99**

▼ **DVD Players**



Polaroid PDV 0700
Playback: CD-R, JPEG, CD-RW, DVD, CD, MP3 -
Portable - 1 Discs - Picture Zoom - Dolby Digital - 7
in
Rating: ★★★★★
Found at: **14 stores**
Lowest price: **\$199.95**

Store Coupons

[ACMEmovie.com](#)
DVD Free shipping for all order of \$30 or more!

[West Marine](#)
Big savings on selected products in the Clearance Center

[Disney Movie Club](#)
Get 3 free movies when you join the Disney Movie Club

[Danskin.com](#)
Free ground shipping with a purchase of \$75 or more

[See all 1370 Store Coupons](#)

Rebates & Incentives

[Nikon Coolpix 4300](#)
\$50 Mail in Rebate

[Nikon Coolpix 3100](#)
\$30 Mail in Rebate

[Canon ZR70MC](#)
Free Pinnacle 8 SE Software by Mail.

[Olympus Camedia D-560 Zoom](#)
\$20.00 Mfr. Mail-In Rebate

[Kodak Easyshare DX6340](#)
\$50 Mail in Rebate

[See all 1013 Rebates & Incentives](#)

Sign-Up for BizRate Money-Saving Emails

Enter Your Email Address

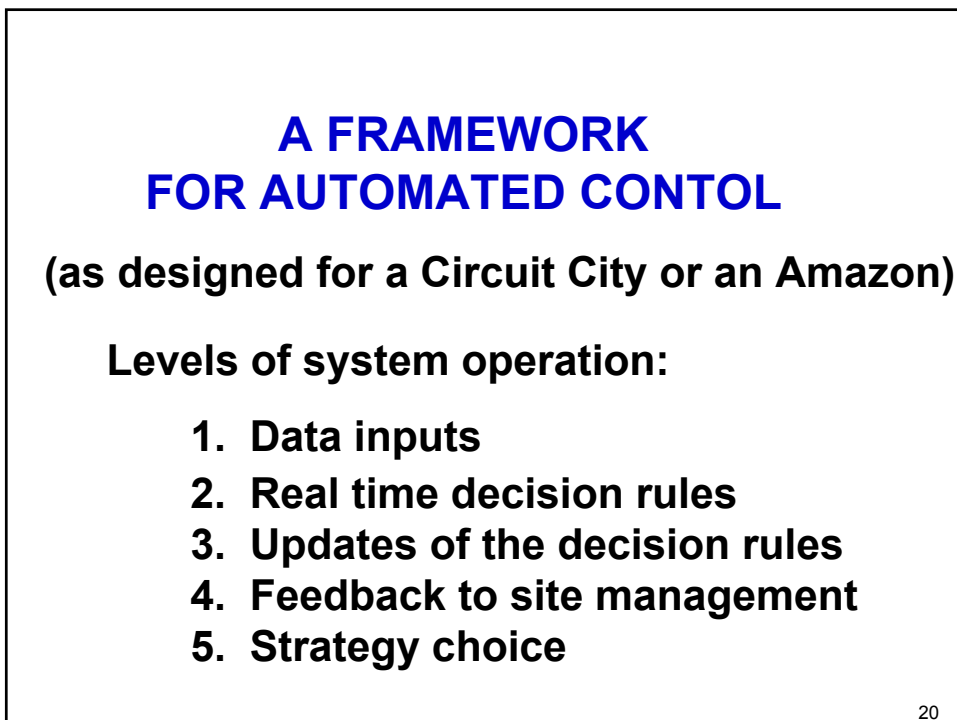
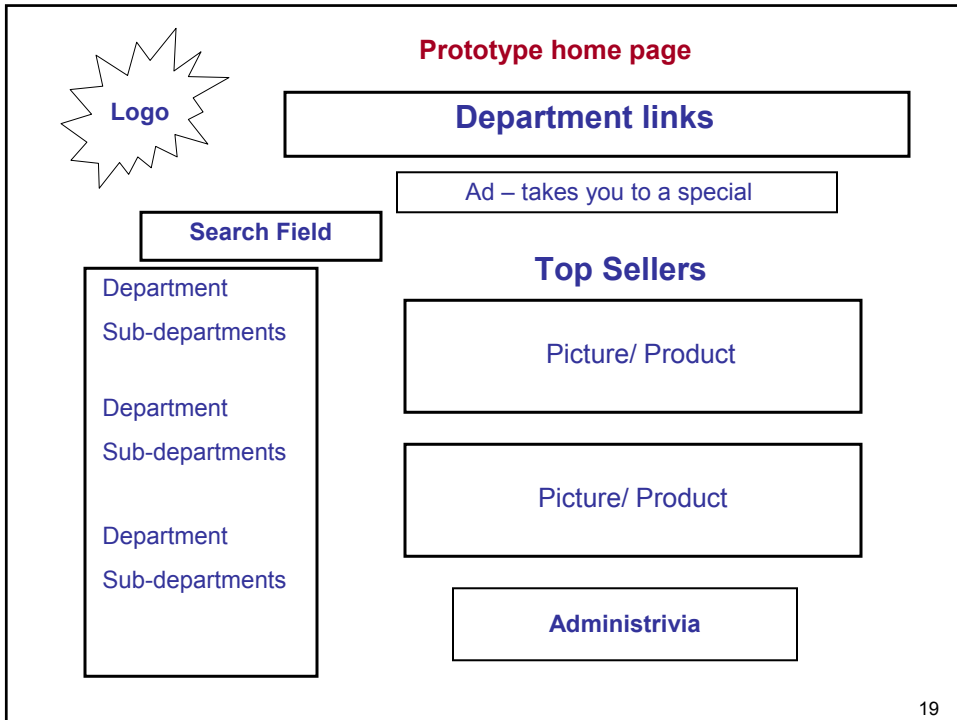
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COMPONENTS OF AUTOMATED CONTROL SYSTEM

Level 1: Data inputs

- clickstreams of visitors and customers
- data from comparison engines, spiders

Level 2: Real time decision rules

- price
- promotion
- display
- page design on the fly
- personalization

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AUTOMATED CONTROL COMPONENTS (cont.)

Level 3: Updating decision rules

- analysis of historical data
- fine tuning of parameters
- adaptive experimentation

Level 4: Feedback to site management

- quality control, trend monitoring
- early warning on market changes

Level 5: Strategy choice

- positioning: Saks or Walmart?
- target segments

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