How user interfaces represent and benefit from a faceted classification system

SOASIS&T July 8, 2004

Keith Instone

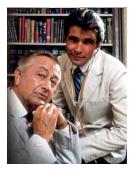
http://user-experience.org/uefiles/facetedbrowse/

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About me

- IBM > ibm.com > user experience design > information architect
 - User experience standards
 - User interface and interaction design
 - IA strategy, user research & modeling, content management
- Argus Associates
 - IA & Usability specialist
- User experience professional
 - Retired: UsableWeb.com, CHI-WEB, CHI reviewing, ...
 - Member: ACM/SIGCHI, ASIS&T, UPA, AIGA, (STC), ...
 - UXnet
- Toledo











About this presentation

- What is faceted browsing?
 - Terminology so that we can communicate better
 - (New terms for old ideas)
- How is it being implemented?
 - Examples, examples
 - (Real world application is fun)
- What do we know (and not know)?
 - Lots of questions to help spur dialog
 - (Dialog because you can learn as much from each other as you can from me)



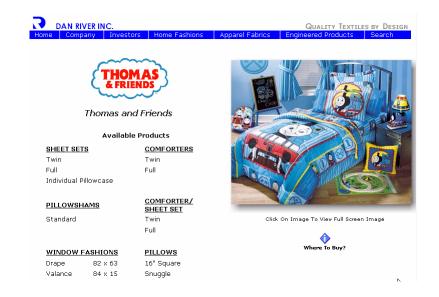
Home fashions for kids





Home fashions for kids > Preschool & educational > Thomas 8 & friends





Brands, Sports, Just girls, All boys, Preschool & educational 10















Scooby-Doo: By gender

Product	All Boys	Just Girls
1. Thumbprints	Yes	Yes
2. Scooby-do	Yes	Yes
3. Silhouettes	Yes	Yes
4. Nostalgic	Yes	Yes
5. What's up Scooby-Doo?	Yes	Yes
6. Sports Legend	Yes	
7. Scooby-Doo's Bold Adventure	Yes	
8. Day Dream'n (Toddler)	Yes	
9. Sweetheart		Yes
10. Springtime		Yes

Туре	Total	Boy	Girl	Neutral	Toddler
Young at heart	2		(2)		
Tonka	2	(2)			
Olive Kids	11	(6)	(3)	(2)	
Casual Kids	2	(1)	(1)		
NFL	4	(4)			
MLB	3	(3)			
NHL	2	(2)			
NASCAR	6	(6)			
NCAA	1			(1)	
Scooby-Doo	10	3	2	5	1 (B)
Looney Tunes	8	1	6	1	
Spiderman	2	2			1 (B)
GI Joe	2	2			
Diva Starz	1		1		
Powerpuff Girls	5		5		1 (G)
Barbie	10		10		
Thomas Tank Engine	3	(3)			1 (B)
Bob the Builder	3	(3)			

"Faceted browsing" defined

- Interaction style where users filter a set of items by progressively selecting from only valid values of a faceted classification system
- Interaction style (& user interface)
 - Focus on what appears on the glass and how it feels
- Facet values selected in any order the user wishes
 - Supports many ways to achieve the same goal
- "Design away the errors"
 - Null results are never achieved (hide non-relevant choices)
 - Common facet values hidden
- Leverages faceted classification schemes
 - "Real library science" for consumers
- "Slow and steady wins the race" interaction
 - Click-page-click-page: trial and error, learning
- Drill-down choices "naturally" reflect depth so far
 - Is there some psychological theory here?

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Epicurious.com Recipe Browser



Preparation method = Microwave



Selecting a Course/meal is next

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Course / meal = Main dish



Scanning the 12 items so far

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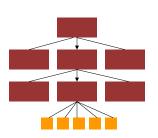
20

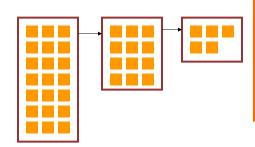
BRAISED PORK CHOPS WITH PEPPERS Gourmet June 1990 BREAKFAST-FOR-SUPPER TOFU BURRITOS CHICKEN BREASTS WITH TARRAGON VINAIGRETTE Gourmet May 1992 CHINESE-STYLE BRAISED BEEF WITH TURNIPS Gourmet October 1991 COQ AU VIN Gourmet December 1990 FILLET OF SOLE WITH LEEK SAUCE Gourmet October 1990 MUSHROOM BARLEY "RISOTTO" MUSSELS WITH SHALLOTS AND TARRAGON Gourmet December 1992 POLENTA WITH VEGETABLES Gourmet December 1992 STEAMED FISH FILLETS WITH SCALLION-GINGER OIL Gourmet June 1991 TOMATO RISOTTO Microwave Gourmet
Barbara Kafka
William Morrow and Co., Inc. ZUCCHINI WITH JALAPENO MONTEREY JACK Gourmet July 1993 1 - 12 of 12

Chicken main dishes you can prepare in the microwave

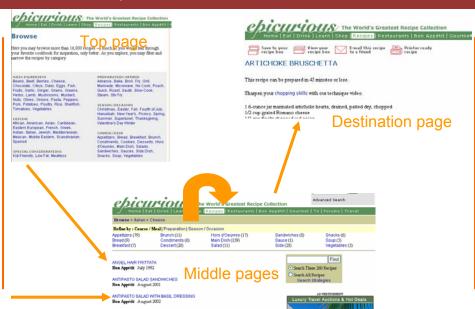


- Old days (danriver.com): Click-click-click on categories and finally get to the goodies at the leaf nodes
- Trend: One click, get a sample of results ("1-10 of 149"), select a category to get fewer results





The pieces of the faceted browse flow



- Facet selection: How do you select a facet and/or facet value?
- Facet history: How do you know what you have selected? How do you undo it?
- The results: How are results displayed? How are they laid out wrt the facet selection and history?
- Item: the basic unit of information, what you are looking for, what gets classified along different facets
- Item count: how many things do we have?
- The classification: behind the scenes but very, very important

Pieces of the user interface



- Faceted browsing (what caught on within IBM)
- Faceted metadata search & browse (searchtools.com, Flamenco)
- Guided navigation (Endeca)
- Faceted navigation (Siderean)
- Facetmap (facetmap.com)
- Faceted classification: the back end stuff (vs. my user interface stuff here)

BRAKOR definitions

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- Faceted classification: Approach to KO that assigns concepts from multiple orthogonal categories (facets) to info objects in a collection. Retrieval = postcoordination.
- Facet: fundamental category by which an object or concept is described.
- Term: In a KO system, concepts are represented by terms – string of characters.
- Concept: node, idea, subject, descriptor.

From *The Barrington Report on Advanced Knowledge Organization and Retrieval*, V1N1, Mar-Apr 2004. kmconnection.com

Browsing vs. Searching vs. Querying

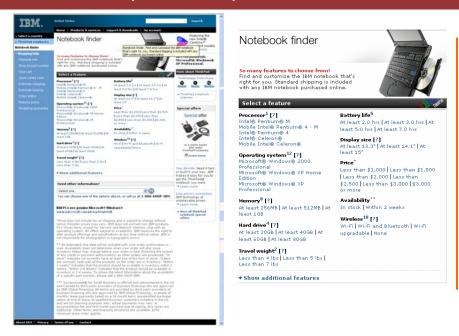


Detailed examples

- IBM finder
- Flamenco
- MSN shopping
- DC2003 proceedings
- Forrester

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Example 1 – IBM product finders



IBM Finder – Page 2

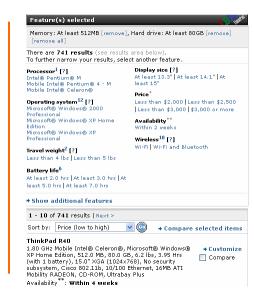
30

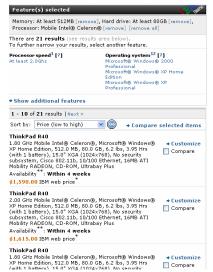


Feature(s) selected Memory: At least 512MB [remove] There are **2,148 results** (see results area below). To further narrow your results, select another feature. Processor¹ [?] Intel® Pentium® M Mobile Intel® Pentium® 4 - M Mobile Intel® Celeron® At least 13.3" | At least 14.1" | At least 15" Operating system¹² [?]
Microsoft® Windows® 20 Less than \$1,500 | Less than \$2,000 |
 Operating system* [1]
 Less than \$2,500 | Less tha Less than \$2,500 | Less than \$3,000 | \$3,000 or more Hard drive⁴ [?]

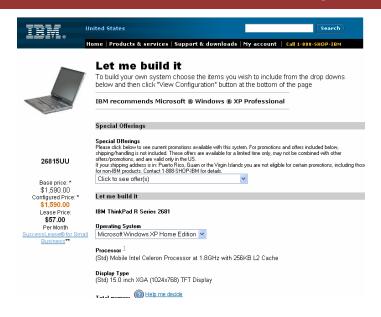
At least 300B | At least 40GB | At least
60GB | At least 80GB Travel weight² [?] Battery life⁶ At least 2.0 hrs | At least 3.0 hrs | At least 5.0 hrs | At least 7.0 hrs ♦ Show additional features 1 - 10 of 2,148 results | Next > ThinkPad R40 ThinkPad R40

1.80 GHz Mobile Intel® Celeron®, Microsoft® Windows®
XP Home Edition, 512.0 MB, 40.0 GB, 6.2 lbs, 3.95 Hrs
(with 1 battery), 15.0" XGA (1024×768), No security
subsystem, cisco 802.11b, 10/100 Ethernet, 16MB ATI
Mobility RADEON, CD-ROM, Ultrabay Plus
Availability": Within 4 weeks
\$1,365.00 IBM web price*





IBM finder – Some results lead to configurators



IBM finder – Facet history



Processor: Intel® Pentium® 4 [remove], Operating system: Microsoft® Processor: Intel® Pentumug 4 (remove), Operating system: Microsoft® windows® XP Home Edition [remove], Memory: At least 512MB [remove], Hard drive: At least 80GB [remove], Price: Less than \$1,500 [remove], Processors speed: At least 2.8Ghz [remove], Form factor: Tower (4x5) [remove], Graphics memory: 128 MB [remove], CD/DVD drive: DVD-ROM

Desktop finder



Feature(s) selected

Processor: Intel® Pentium® 4 [remove], CD/DVD drive: DVD-ROM [remove], Operating system: Microsoft® Windows® XP Home Edition [remove], Memory: At least 512MB [remove], Hard drive: At least 80GB [remove], Price: Less than \$1,500 [remove], Processor speed: At least 2.8Ghz [remove], Form factor: Tower (4x5) [remove], Graphics memory: 128 MB [remove] [remove all]

There are 4 results (see results area below).
To further narrow your results, select another feature.

♦ Show additional features

Sort by: Price (low to high)

◆ Customize

Compare

ThinkCentre A50p

2.80 GHz Intel® Pentium® 4, Microsoft® Windows® XP Home Edition, Tower (4x5), 512.0 MB, 80.0 GB, No security subsystem, Integrated Intel PRO/100 Ethernet, 128 MB ATI Radeon 9600 Pro TV-out DVI-D AGP 8X,

DVD-ROM Availability **: Within 4 weeks

\$1,359.00 IBM web price

Desktop finder



Processor: Intel® Pentium® 4 [remove], Operating system: Microsoft® Windows@ XP Home Edition [remove], Memory: At least 512MB [remove].
Hard drive: At least 80GB [remove], Price: Less than \$1,500 [remove],
Processors speed: At least 2.86hz [remove], Form factor: Tower (4x5)
[remove], Graphics memory: 128 MB [remove] [remove all]

There are 13 results (see results area below). To further narrow your results, select another feature.

CD/DVD drive⁵ [?]

→ Show additional features

1 - 10 of 13 results | Next > Sort by: Price (low to high)

<u>v</u> 🙃 → Compare selected items

ThinkCentre A50p

IninkLentre A50p
2.80 GHz Intel® Pentium® 4, Microsoft® Windows® XP
Home Edition, Tower (4x5), 512.0 MB, 80.0 GB, No
security subsystem, Integrated Intel PRO/IO0 Ethernet,
128 MB ATI Radeon 9600 Pro TV-out DVI-D AGP 8X , CDROM

Compare

Availability**: Within 4 weeks

IBM finder – Additional facets

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Desktop finder



So many features to choose from!
Find and customize the system that's right
for you. Standard shipping is included with
any IBM desktop purchased online.
Monitor not included.



Select a feature

Processor¹ [?]

Intel® Pentium® 4 w Technology Brand Intel® Pentium® 4 Intel® Celeron®

Operating system¹² [?]

Professional Microsoft® Windows® XP Home Edition Microsoft® Windows® XP Professional

Form factor [?]
Desktop (3x4) | Desktop (4x4) |
Small Desktop (4x3) | Small Form
Factor (2x3) | Tower (3x5) | Tower (4x5)

At least 256MB | At least 512MB | At least 1GB

♦ Show additional features

Hard drive⁴ [?]

At least 60GB | At least 80GB | At least 120GB

CD/DVD drive⁵ [?]

Graphics memory Integrated graphics | 64 MB | 128 MB

Less than \$500 | Less than \$750 | Less than \$1,000 | Less than \$1,500 \$1,500 or more

Availability**

In stock | Within 2 weeks

Desktop finder

So many reacures to choose from: Find and customize the system that's right for you. Standard shipping is included with any IBM desktop purchased online.

Select a feature

Processor¹ [?] 8 4 with HT Intel® Pentium® 4 Technology Brand Intel® Pentium® 4 Intel® Celeron®

Operating system¹² [?]

Microsoft® Windows® 2000 Professional Microsoft® Windows® XP Home Edition Microsoft® Windows® XP Professional

Form factor [?]
Desktop (3x4) | Desktop (4x4) |
Small Desktop (4x3) | Small Form
Factor (2x3) | Tower (3x5) | Tower

Memory⁸ [?]

At least 256MB | At least 512MB | At least 1GB

♦ Hide additional features

Security subsystem [?]
IBM Embedded Security Subsystem 2.0 | None

Ethernet [?] Gigabit Ethern

Gigabit Ethernet Integrated Intel PRO/100 Ethernet

Hard drive⁴ [?]

At least 60GB | At least 80GB | At least 120GB

CD/DVD drive⁵ [?]

CD-ROM
CD-RW
CD-RW
CD-RW/DVD-ROM
DVD-ROM
DVD-ROM
None

Less than \$500 | Less than \$750 | Less than \$1,000 | Less than \$1,500 |\$1,500 or more

Availability**

In stock | Within 2 weeks

Product Family NetVista M Series | ThinkCentre A Series | ThinkCentre M Series | ThinkCentre S Series

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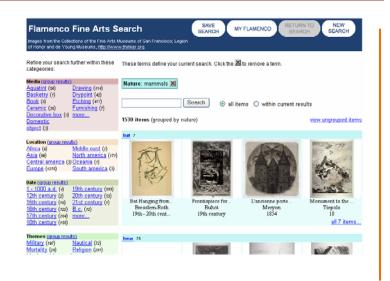
Dissecting IBM finders



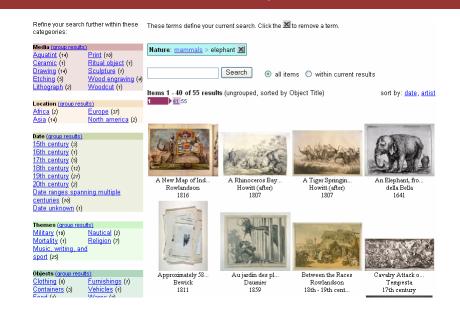
Example 2 – Flamenco (fine arts)





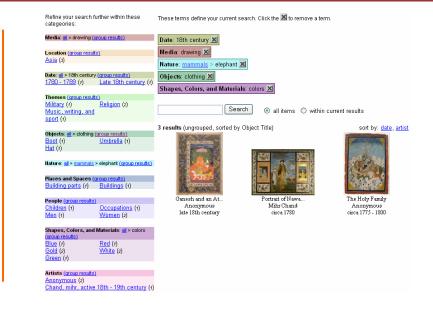


Flamenco - Elephants



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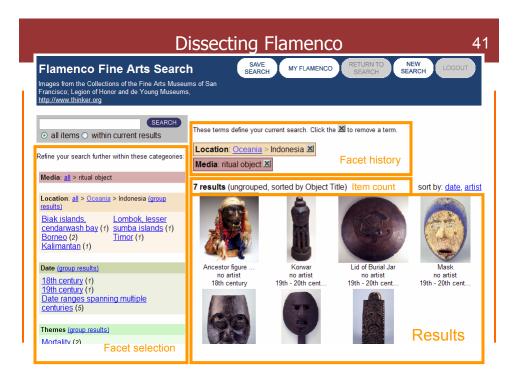
Flamenco – 3 elephants



Flamenco - An item



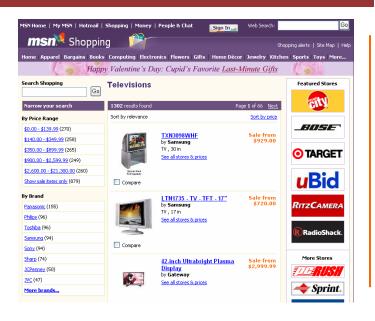




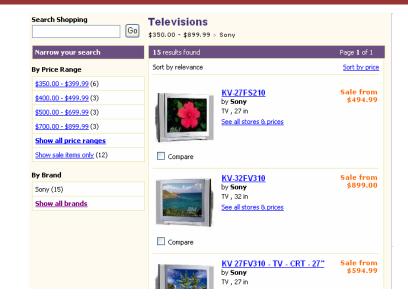
Example 3 - MSN shopping (TVs)



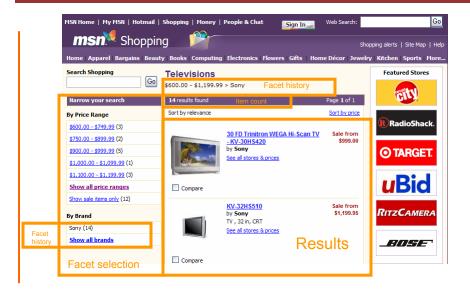




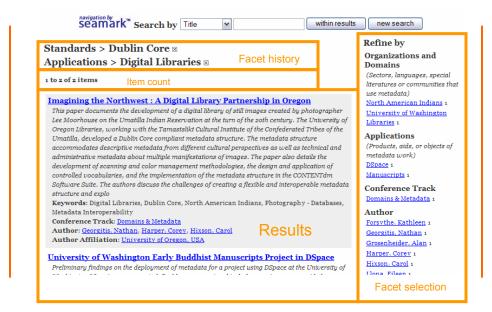
MSN - Middle page



Dissecting MSN Shopping



Dissecting DC 2003 proceedings

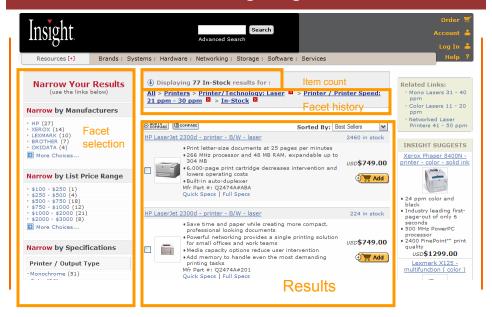


Dissecting Forrester





Dissecting Insight



Comparing examples

	Epicurious	IBM	Flamenco	MSN	DC2003	Forrester
Top page (no results)	Yes	Yes	Yes	No	yes	Yes
Facet selection	1 facet at a time	More facets Top	Left	Left "More brands"	Right More	Left More
Facet history	Single Breadcrumb	Commas [remove]	Blocks [x]	Dead breadcrumb "Show all"	Separate breadcrumbs [x]	List, Remove term Contextual info
Results	Plain	Sort Compare	Grouping	Sort Compare	Exposed values/links	Plain
Destination pages	Islands	Islands	Exposed values/links	Islands	Islands (PDFs)	Islands (?)

- IBM software Find-by
 - Just a gateway to sub-sites
- Amazon.com Shop-by browsing
 - Shop by brand: not FB
- Yahoo! Electronics Finder & Zilog Parametric search
 - "Faceted querying"
- Boston Scientific
 - "Faceted searching"
- Dick's Sporting Goods Shoes
 - 3 steps: Brand is contextual to size
- CNET Shopper Filter-by
 - Filter values are generic

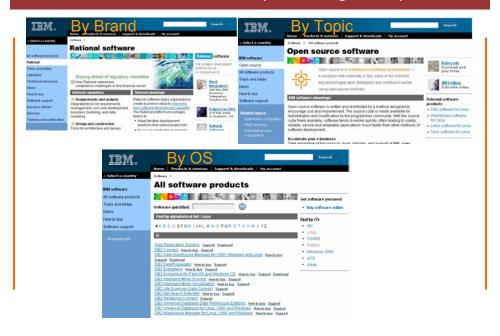
IBM Software Find-by





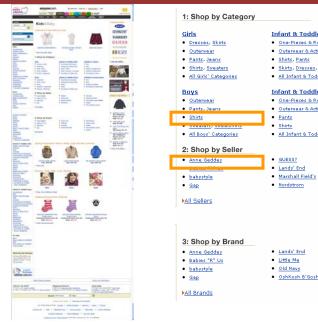
IBM Software Find-by: Just a gateway

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Amazon.com Shop-by Browsing (Kids)

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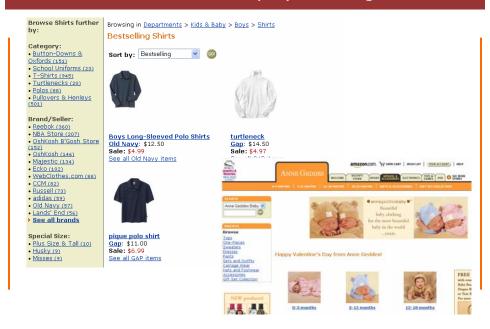


Infant & Toddler Girls Children's Shoes One-Pieces & Rompers • <u>Girls</u> • Boys Outerwear & Active Wear Infant & Toddler Girls Skirts, <u>Dresses</u>, & <u>Jumpers</u> Infant & Toddler Boys All Infant & Toddler Girls All Children's Shoes Infant & Toddler Boys Children's Accessories Girls Boys One-Pieces & Rompers Outerwear & Active Wear Infants & Toddlers All Children's Accessories All Infant & Toddler Boys Old Navy OshKosh B'Gosh • Polo Ralph Lauren (new) • Target The Children's Place Petit Bateau Ralph Lauren Target The Children's Place OshKosh B'Gosh

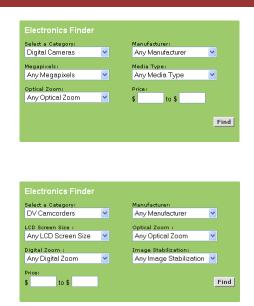
Amazon.com Shop-by Browsing

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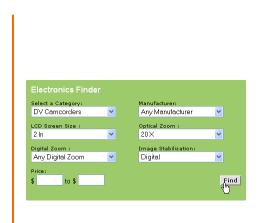
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Yahoo! Electronics Finder (Query interface)

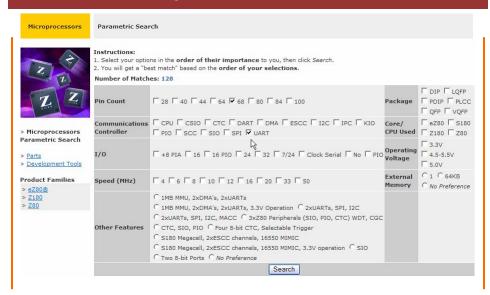




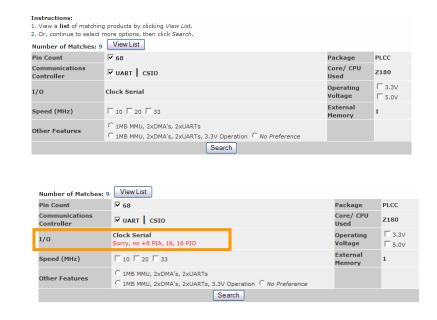


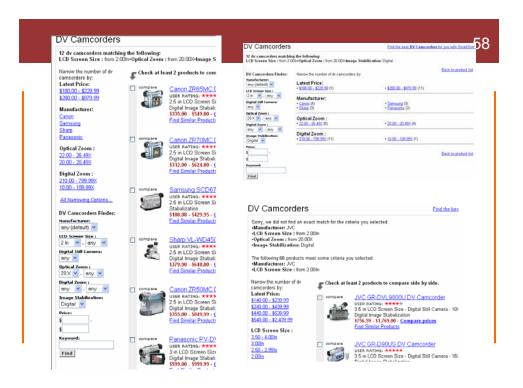


Zilog "Parametric Search"



Zilog results





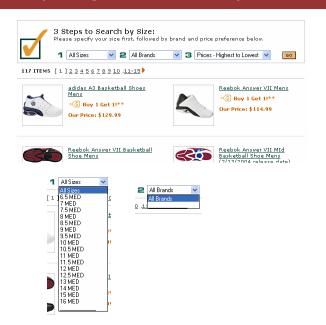
Boston Scientific

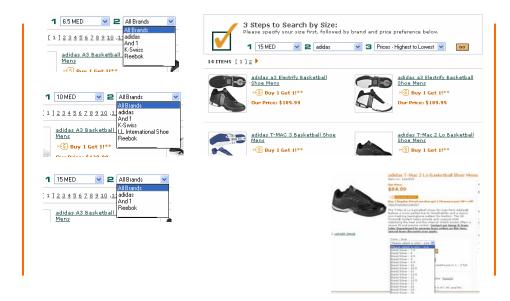
59

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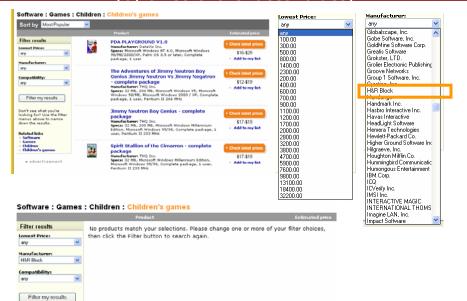


Dick's Sporting Goods: Shoes by Size & brand





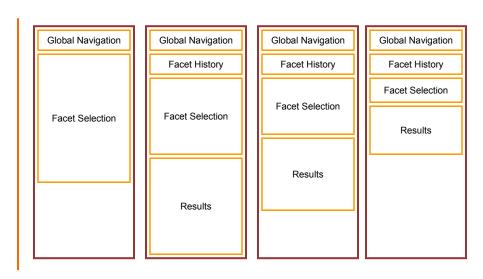
CNET Shopper: Filter results (by all software facet values)



• What I can confidently recommend:

This page intentionally left blank...

The model – "natural" selection?



- What is the best flow?
 - Top page: good or bad?
 - How integrated should the destination pages be?
- How should the elements be arranged on the page?
 - Facet selection on top vs. left, for example
- How easy is this to learn?
 - Special words or phrases to clue users in?
 - Is it just a matter of trying it out?
- What contexts does this work well in?
 - "Finders" vs. "Configurators"
 - Shopping by (physical) attributes
 - More abstract/diverse objects: how homogeneous?
 - Flamenco (CHI '03): better than keyword search for image collection

Facet selection questions

- What if you have too many facets?
 - Show / hide or eliminate?
 - How many is too many? (Too few?)
- What if you have too many facet values?
 - Selected set and "show all"?
- Do you show the hits on the links?
- What if users need to select more than 1 value for a given facet?
- Can we think of keyword search as just another type of facet selection?



Applications (Products, aids, or objects of metadata work) Controlled Vocabularies 2 Digital Collections 2 Digital Libraries 7 Domain metadata 6 Images 2 Registries 4 Schemas 4



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Narrow by Brand/Seller Carabella Collection (660) Blue Sky Swimwear (478) Newport News

Brands (344) Figleaves (339) Lands' End (194)

Spiegel (157) Solar Tan Thru Swimsuits (147) Nordstrom Store (117) TYR (61)

MyBeauty (80)

Speedo (55)

- Are breadcrumbs a good user interface for this?
 - vs. "undo" metaphor
- Do users understand what they are doing when they undo?
- How useful is the "remember what you chose" aspect?
- Should history be integrated with selection?



More tough questions

- Which is better: menus or lists of links?
 - Menus: less real estate
 - Many facet selections at once: that is better, no?
- How does FB fit into the top-down IA of a site?
 - Just an overlay on items vs. integrated items

- How does the faceted classification & user interface work go hand-in-hand?
 - Classification first and then UI? UI drives classification?
- Determining facets
 - Hierarchical facets, # of facets, usefulness of each facet
- Facet values
 - Labels, thus, user interface
- "Spectrum" (numerical facets)
 - Range-making at the UI layer vs. tagging 51,300.00 52,399,99 (204)

ling | Less than \$2,000 | Less than \$2,500 | Less than \$2,500 | Less than \$2,500 | Less than \$2,500 | Less than \$2,000 | Sp.000 | Sp.0000 | Sp.00

Show sale items only (659)

Less than \$1,000 Less than \$1,500

Is it worth the effort?

- Forces "data cleansing"
- ROI (sell more stuff)
 - Conversion rate
 - Goal attainment
 - Decision to purchase
- Strategic value
 - Personalization

- Faceted browsing (UI & interaction)
- UI pieces: Facet selection, facet history, results
- The flow: Top page, middle pages, destination page
- The IA: Faceted classification
- Lots of examples
- Lots of questions
- So what? What are you going to do next?

Stay in touch

- Information Architecture Summit
 - Austin, TX, Feb '04. Montreal, 2005
 - http://iasummit.org/
- If you are a student/professor who wants to research concepts related to FB, contact me
- If you are applying any of this, let me know what you discover
- IAslash.org where IAs blog
 - FB: http://iaslash.org/taxonomy/page/or/166
- http://user-experience.org/uefiles/facetedbrowse/