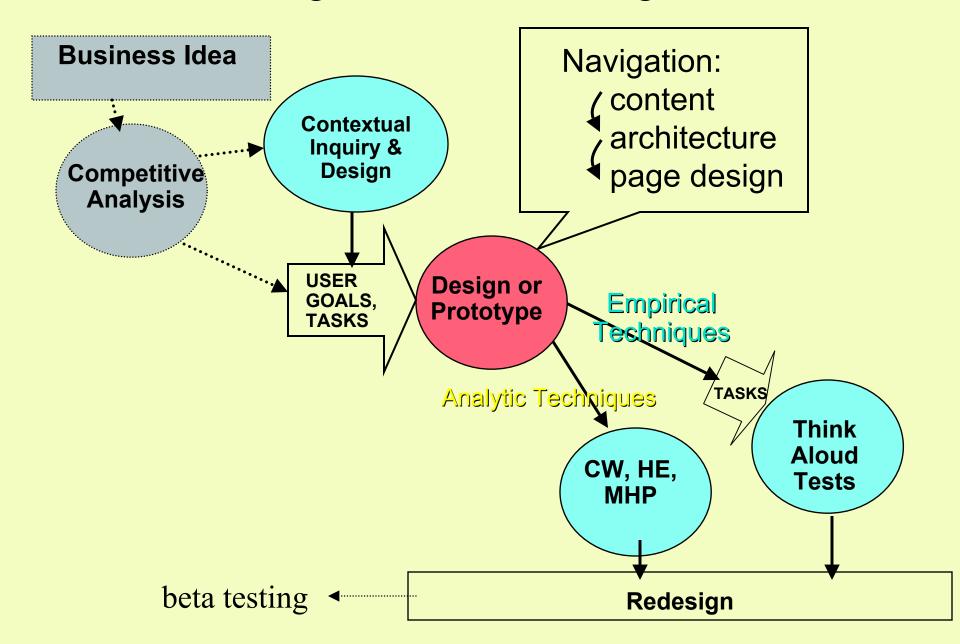


Navigation

- Definition: Directing one's course; finding one's way to a goal.
- An old topic in information retrieval, made especially important by the advent of the Web and ecommerce.

Navigation in the Design Process



Key Concept: Information Scent

- Theory from Xerox Parc
 - » Stu Card & Peter Pirolli
 - » Arose from development of hyperbolic tree browser; modelling user search
- Major assumptions.
 - » Users are "foraging"
 - » Goal is information (content)
 - » Proximal cues guide search.

Example - Looking for a job (1999-2001 site design)



Classifieds





PG Home

PG News

Special Reports

News Links

Photo Journal

AP Wire

Sports

Classifieds

Autos

Weather





Classifieds Connection













click on "cue" -category link

Link leads to another cueanother "category link"



Classifieds

UN AIP
TV and Radio

G Home

lassifieds

mployment

eal Estate

utomotive

reat Outdoors

arm & Lawn

lerchandise

obbies

ets

nnouncements

egal Ads

usiness Opps

ersonals

lace an Ad





Search Employment

Category	All Categories	+
Date	All Dates	\$
Type of Search	Exact Match	\$
Keyword(s)		





The Pittsburgh Post-Gazette and JobOptions Employment Connection is a best-of-class forum for job seekers in the Pittsburgh area to easily access quality employers, locally and across the U.S., with a few simple clicks of the mouse. Important, too, the Employment Connection

2002



Sports

"Jobs" link leads to named categories

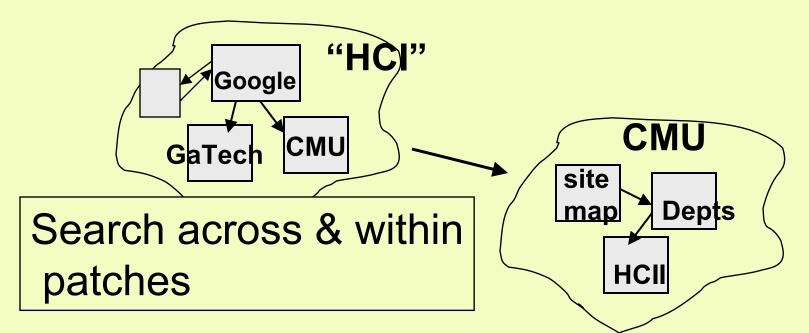
	Hews	Shores	Lifestyle	Ciassilicus	ADOUL US
	Classifie			Take me to	Ģ <mark>Go</mark>
Classifieds	Home > Classifieds > Jo	bs			
Announcements Business Opps Business Svcs. Cars	Jobs				
Celebrations	Search by category			□ Sea	rch all categories
Consumer Rates Farm & Lawn Garage Sales Great Outdoors Hobbies Jobs Legal Notices Legal Services Merchandise Mortgage Rates Obituaries	Accounting/Finance Career Training Employment Agencies Employment Information So Employment Wanted-Dome Engineering/Technical Health Care Professional Resume Service Seasonal Jobs		Compu Emplo Emplo Emplo Gener Manag	ottive Careers uter Professionals yment Consultants yment Services yment Wanted-Professi al Help Wanted jement Consultants esional Outplacement Marketing Services	ŭ
Personals	Date	All Dates			•
Pets Place an Ad Real Estate-Com.	Type of Search				_
Real Estate Rental Real Estate Sales	Keyword(s)			Sea	arch
Travel Getaways	Click here for contact inform	ation, including	how to place o	lassified ads.	

Classifieds

About Us

Theoretical arguments

- Search has energy costs.
- Users attempt efficiency (stay within page or site if there are cues). Giving up is very low cost.

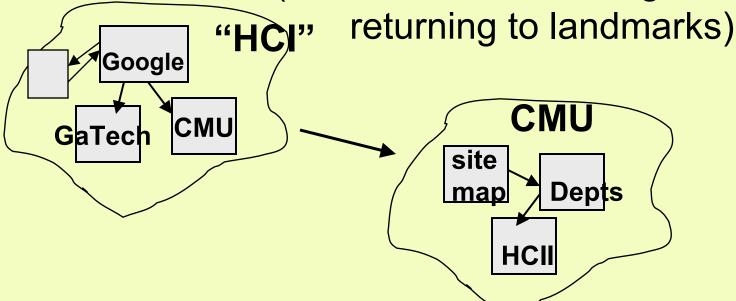


Heuristic nature of search

- Search occurs across problem spaces (MHP theoretical legacy)
 - URL typing
- link search

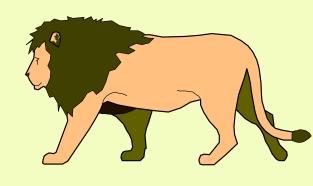
- key word

- visual search
- "Un-GOMs-like" (nonlinear backtracking,





Ecommerce adaptation



- From research on consumer behavior
 - » Hunting & gathering versus foraging
 - » Hunters follow the scent to prey; gatherers happen on a scent (impulse shopping).
- Must pull user towards content (a target) with a clear scent of information (cues).
- Users need confidence
 - » Before click, that they are on the right track
 - » After click, that they are closer.

Research on "Hunting"

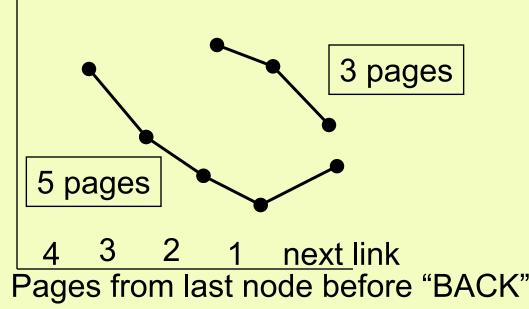
- Users start general and then narrow.
- Users can tell you if they are on the right track
- Users can't tell you how far away they are (most think they are 1 or 2 clicks away)
- As long as users think they are on the right track, they will keep clicking.
- So. . .every design element that gives users more confidence,keeps them there and pulls them to content.

Importance of Scent

- No controlled experiments so far
- •Comparison of sites with/without stronger scent (ratings of information similar to goal) shows stronger scent associated with sticking to 'trail" within a site

scent rating

From Card et al., CHI 2001



Great strides in the last 5 years but there remains much room for improvement. See clutter on this site.

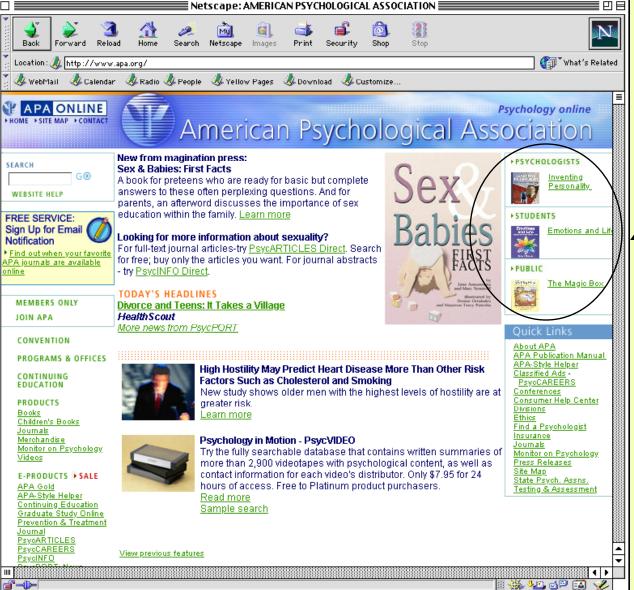


This is only 1/3 of the home page.

Customers find simple flight search but other tasks harder.

How people gain and lose scent:

APA home has a mix of information for different constituencies. How to appeal

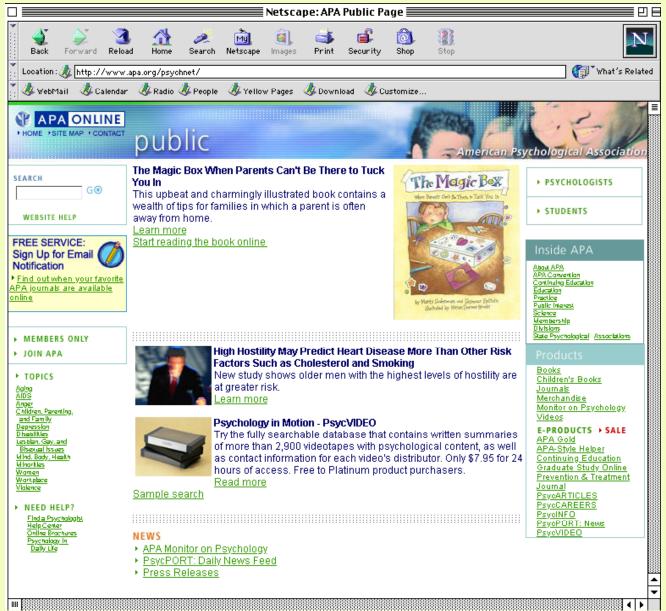


User categories

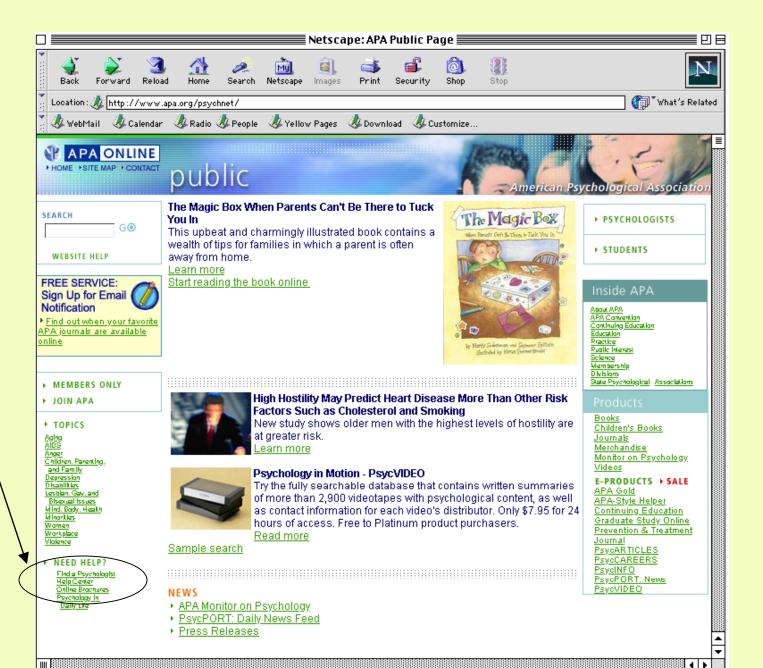
Task: You are looking for a therapist who practices in Florida. What do you do next?



If you clicked "Public"



Click on "Find a psychologist"



Assumes you recognize "therapist" = "psychologist"

All that for a phone number?

Find a Psychologist

HOME S

SITE MAP

SEARCH

FREE BROCHURES

FIND A PSYCHOLOGIST

A psychologist can help you cope with many of life's problems. The American Psychological Association does not provide referral services. For a referral to a psychologist in your area call 1-800-964-2000. The operator will use your zip code to locate and connect you with the referral system in your area. Neither APA nor the operators answering the 800 number can respond to specific questions regarding personal situations, appropriate diagnosis or treatment, or otherwise provide any clinical opinions. If you do not live in the United States or Canada, contact your national psychological association or local mental health facility. If you believe you need immediate assistance, please call your local emergency number or the mental health crisis hotline listed in your local phone book's government pages. Because APA does not operate, supervise, or exercise any control over any of the above-referenced referral services, it makes no representations or warranty whatsoever, either express or implied, regarding any information or advice provided by these referral services. In no event shall APA be liable to you or anyone else for any decision made or action taken in reliance on information provided by these referral services.

Research on Scent and Scent Blockers

- Users find content in 4 ways
 - » memory type URL
 - » search engine type key words
 - » link following
 - » visual search of page (next lecture)
- Any method can turn up scent
 - » e.g., "www.landsend.com"

Memory

- People recall brand name URLS
 - » cancernet.gov or NCI.gov vs. macys.com
- Many people type URL into Google



Category: Arts > Writers Resources > Style Guides

Show stock quotes for APA (Apache Corporation)

AMERICAN PSYCHOLOGICAL ASSOCIATION

... JOBS AT APA, ... PSYCHOLOGISTS, Visit APA's new site for Early Career Psychologists.

STUDENTS. Graduate Study in Psychology (2002) Book version Online version. ...

Description: Home to the American Psychological Association.

Category: Health > Mental Health > Associations

www.apa.org/ - 23k - Cached - Similar pages

Search Engines

- Web search better than site search
- Site searches often fail within web sites
- Usability Engineering study of video and CD sites, 2001
 - » Hunters: 53% users found content goal with category links vs. 30% with search engine
 - » Gatherers: 74% users found new content of interest with category links vs. 26% with search engine
- New study in 2002 of apparel and home goods sites: Search did worse.

Example. "Return policy" in search box found 39 books, no policy.



the American People to Return to Greatness -- Courtney, Jr. Burton; Hardcover

American Solution Without Sacrifice: An End to Special Interests a Return to

American Middle-Class Interests -- Ronald A. Drum; Paperback

your guide

learn how

Link Following

Problem is to differentiate links

AT HOME WOME	MEN	YOUNG ATTITUDE	JEWELRY	GIFTS	TRENDS	BOUTIQUES

You are an 18 yr old female student, shopping for clothes for college.

- •women or young attitude?
- •beauty or boutiques?
- •Design challenge: many differentiated categories easy to find and linked to content

Earliest empirical study of interface features that increase store traffic and sales

Gerald Lohse and Peter Spiller (1996)

- •Measured 32 store features for 28 Internet retail stores.
- Examined monthly traffic & sales in April 1996
- Multiple regressions to predict traffic and sales

Features studied

- Store navigation
- Product search
- Site maps
- Product lists: name, navigation, images, price
- Number of products
- Product descriptions
- Multiple shopping modes
- Multiple store entrances
- Service information
- Company information, etc.

Product lists

VIDEOS

Click on the Product Name to see additional information:

Product Name	Product Type	Price
A Baby's World	Video	\$ 39.95
A Little Duck Tale	Video	\$ 9.99
African Shark Safari	Video	\$ 19.95
Amazing Earth	Video	\$ 29.95
Amer. Rd. Trips: Blue Ridge Mtns, Vermont and Mich	null	\$ 19.95
Amer. Rd. Trips: California, Hawaii and Alaska	Video	\$ 19.95
Amer. Rd. Trips: Montana, Idaho, Wyoming, & Wash.	Video	\$ 19.95
Amer. Rd. Trips: Red Rock, New Mexico, Natchez	Video	\$ 19.95
America's Great Parks	Video	\$ 19.95
American Commandos	Video	\$ 19.95
An Interior Motives Christmas	Video	\$ 19.95
Ancient Inventions	Video	\$ 49.95
Ancient Warriors	Video	\$ 49.95
Animal Planet National Dog Championship	Video	\$ 19.95
Apartheid's Last Stand	Video	\$ 19.95
Archaeology: Mysteries of the Holy Land	Video	\$ 19.95
Arthur C. Clarke's Mysterious Universe	Video	\$ 24.95
Astronomy 101	Video	\$ 14.95
Banished: Living with Leprosy	Video	\$ 19.95
Battle of Midway: A Twist of Fate	Video	\$ 19.95
Battle of the Alamo	Video	\$ 19.95



Home Office Supplies Furniture Technology Business Services

Need the perfect holiday gift? Click here to visit our Holiday Center today!

Weekly Specials <u>Cartridge Deals</u> Rebate Center Auctions Dividend\$ Reward Program Search categories by Keyword(s), Item No., or Brand.

All Areas ŧ١

Order by Catalog No. Search

Request a Catalog

Weekly Specials

Holiday Essentials Great Low Prices!



CLICK TO ENTER

Cartridge Deals

Holiday Mailing & Shipping Essentials

Great Values!

Clearance Center

Top Quality Items at Exceptionally LowPrices!

Be among the first to receive hot offers and news from Staples!

Enter Email Address:

Go

Office Supplies

> Binders & Binder Accessories

Search Help Advanced Search Featured Brands

- > Briefcases & Travel
- > Cartridges & Toner
- > Desk Accessories & Rolodex
- > Envelopes
- > File Folders & Filing
- > Forms & Stamps
- > Labels
- > Mail & Ship
- > Maintenance & Breakroom
- > Pads & Post-It® Notes

Furniture

- > Bookcases
- > Chairs & Chairmats
- Desks & Collections
- > File Cabinets
- > Lighting

Technology

- > Audio for the Office
- > Cartridges & Toner
- > Computer Accessories
- > Computer Media
- > Computers & Monitors
- > Copiers & Fax
- > Digital Cameras & Scanners
- > Internet Services
- Networking

Business Services

We've Got You Covered

- > Paper
- > Pens, Correction, Markers & Art
- > Planners & Calendars
- > Presentation & Meeting Supplies
- > Printing Services
- > Retail Sales Supplies
- > Rubberbands, Clips & Tacks
- Scissors, Rulers & Trimmers
- Staplers & Paper Punches
- Storage & Organization
- > Tape, Glue & Adhesives
- > Office Furnishings
- Panel Systems
- > Printer/Machine Stands
- > Shelving & Storage Systems
- > Tables
- > Office Machines
- > Office Machines Supplies
- > PDAs & Handhelds
- > Peripherals
- > Printers & Multifunction Machines
- > Ribbons
- > Software, Licensing & Downloads
- > Telephones & Communication

Check Out These Services

Login

New to Staples.com?

Click Here to Register

User Name

Password

Company ID (if applicable)

Forget your Login info?

Gο

Shopping Cart

O Line items in your cart Hide Item Summary

Item Summary

Subtotal: \$0.00 Free Delivery on most orders

over \$50! Checkout | View Cart Details

Favorite Items

Shopping made easier! Save lists of the products vou buy most with Favorite Items. Don't forget to use

Email Reminders to be alerted when it's time to reorder.

Click on Add to Favorites next to any product to get started. Get More Information

Favorite Aisles

Make browsing easier! Use Favorite Aisles to create lists of the product categories you visit most.

Create a Profile or Login above to get started.

Multiple shopping modes

CHECKOUT

Page 1 of 4 MORE ►

Order Online or Call 1 800 889 9950 to place your order.

Store Home | View Cart | Checkout | Privacy/Security | How to Order | Customer Comments | Search

Picture: DCI | © Copyright 1999 Discovery Communications

Main findings

Product list navigation explained. . .

7% of variance in monthly traffic

61% of variance in monthly sales.

Each additional mouse click reduced the probability of a purchase.

Store entrances.

7% variance in traffic

10% variance in sales

3% sales per entrance

Most stores had too few entrances.

Promotions.

1% variance in traffic

4% variance in sales

Worked for main entrances not exit

More findings

- More products
 No effect on sales but 17% of variance in traffic
- FAQ section

Stores with a lot of traffic added FAQ to deal with customer questions.

Customer feedback

9% variance in monthly traffic

1% variance in monthly sales

Good service associated w. higher sales.

Scent blockers

- Links that lie
- Missing keywords
- More general content
- Cute or weak links
- Intrusive gateways

Loss of confidence causes people to give up. They often leave for good.





404 ERROR MESSAGE

The page you requested cannot be found. The page you are looking for mi changed, or is temporarily unavailable.

Please try the following:

- If you typed the page address in the Address bar, make sure that it is spe Open the <u>www.cnn.com</u> home page and look for links to the information
- Use the navigation bar on the left to find the link you are looking for.
- Click the Back button to try another link.

See weather related to ...

Enter a term in the search form below to look for information on CNN site

Sorry, the page you re-

It is possible you typed the address incorrectly, or that the page no longer exists. A get your local weather forecast or visit any of the pages listed below.

Get the Plug-In

Get the plug-in now, then return to the page to enjoy all it has to offer.

Not Found

The requested URL /AnErrorPage.shtml was not found on thi

The page you're viewing has information that requires a browser "plug-in", which is

Connect With Your Weather

Get Your Local Weather Forecast

Health Outlook Travel Outlook **Events Outlook**

Recreation Outlook

Home & Garden Error — Page Not Found

Enter city or US zip

Other Useful Links weather.com Homepage

Weather Maps Weather News Weather Video

The page cannot be displayed because you need some fresh air

> wards ournals

ubscribe lder stuff

The page you are looking for is currently unavailable. Your ISP

has told us that you're on-line several hou just ain't right.

The page you've requested has been moved or taken off the site. We apologize for the inconvenience.

There are several ways you can find the information you need:

TIME Magazine

Search the TIME Archive

News for Nerds. Stuff that matters.



\$

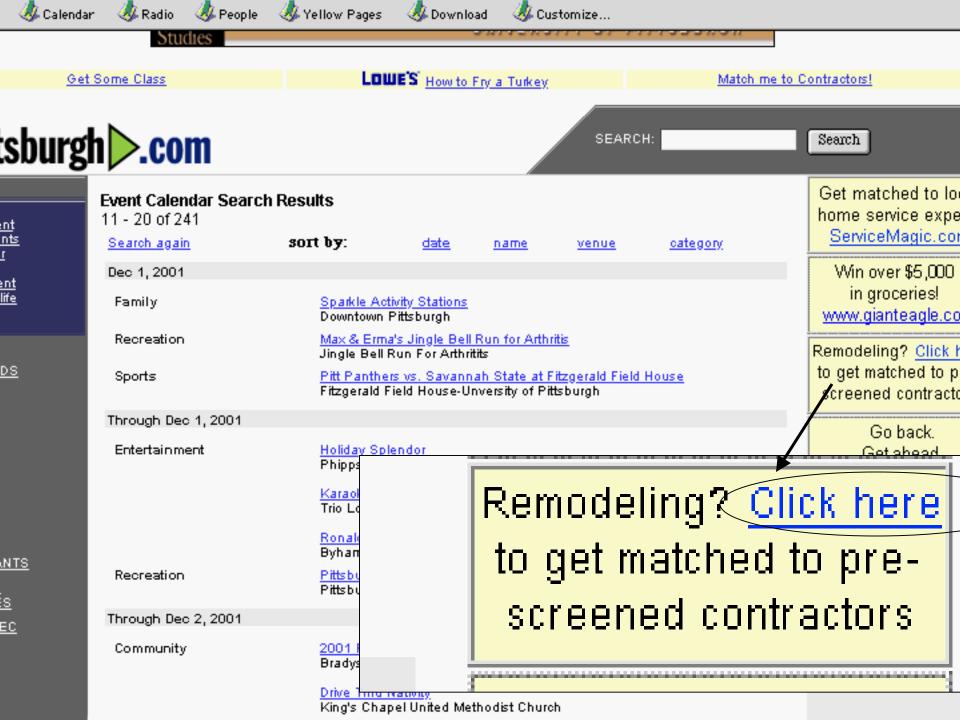
Please, for the love of god, try the followike

- Don't click the Refresh button. (
- If you are about to spend another follows page then please contact Amazon Anony references

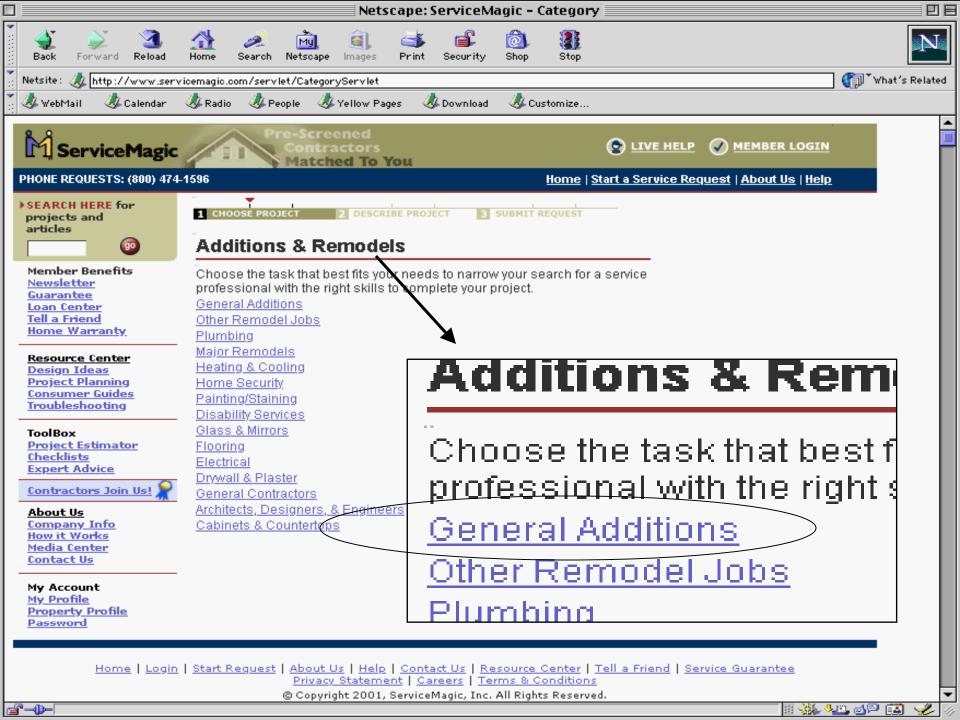
404 File Not Found

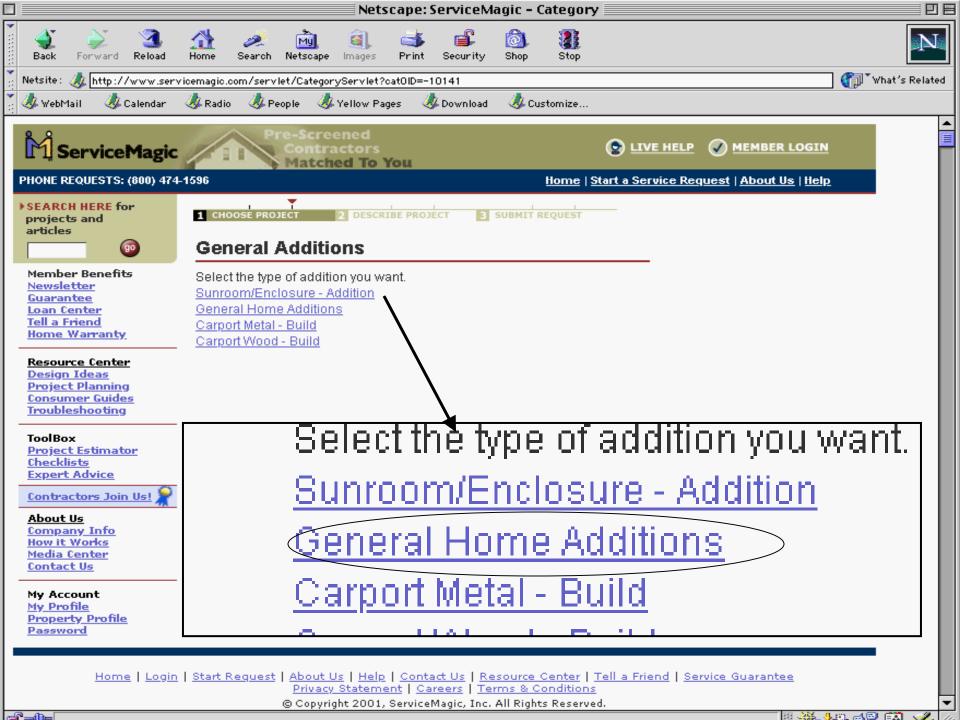
The requested URL (AnErrorPage.html) was not found.

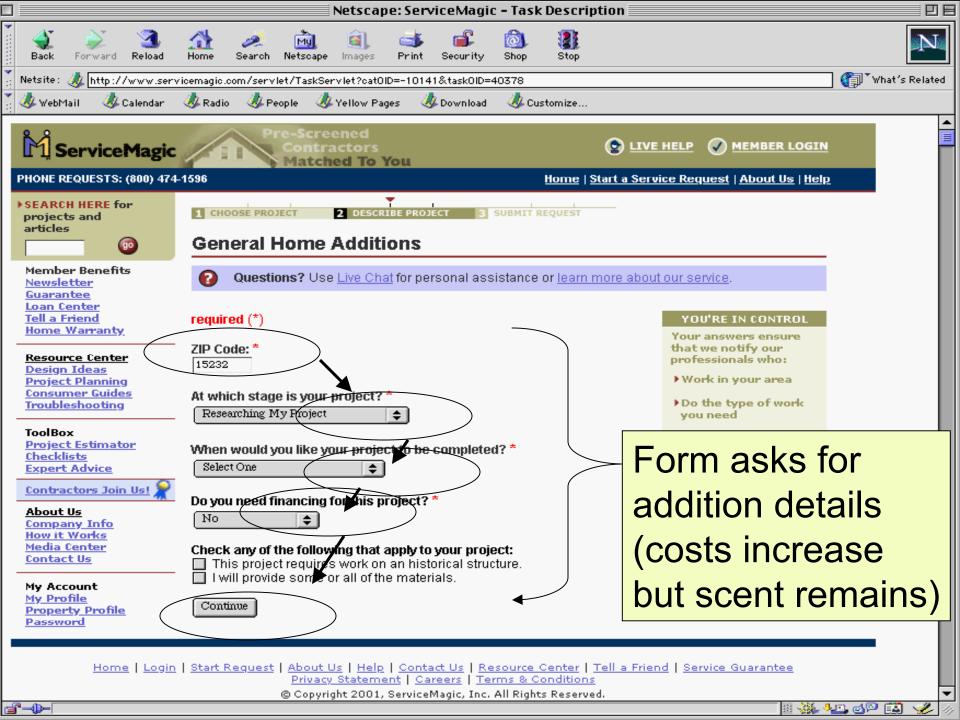
If you feel like it, mail the url, and where ya came from to pater@slashdot.org.

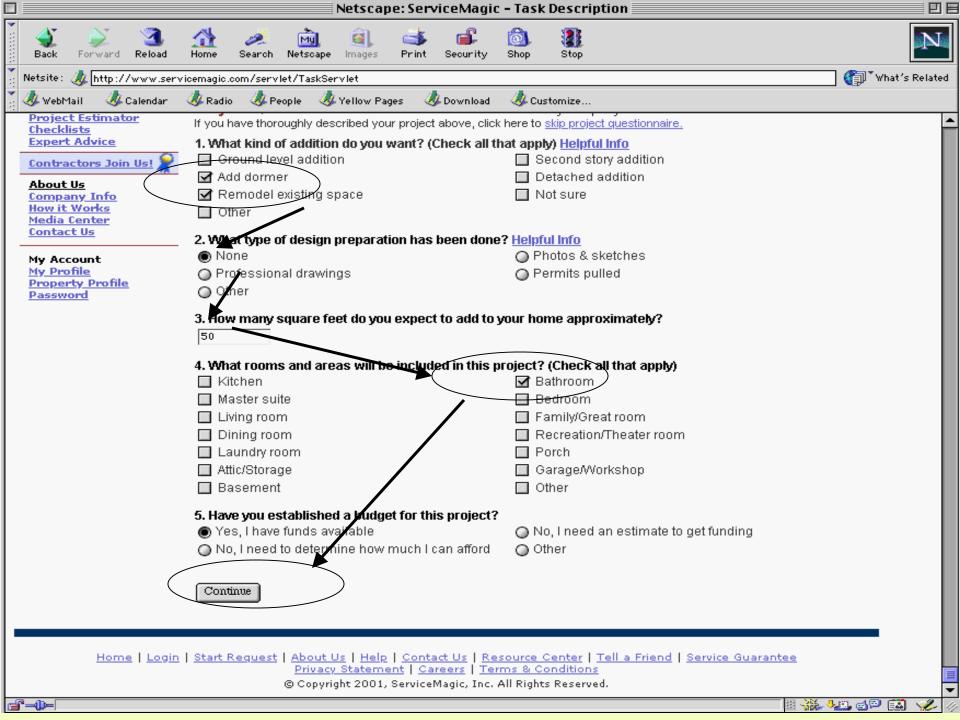


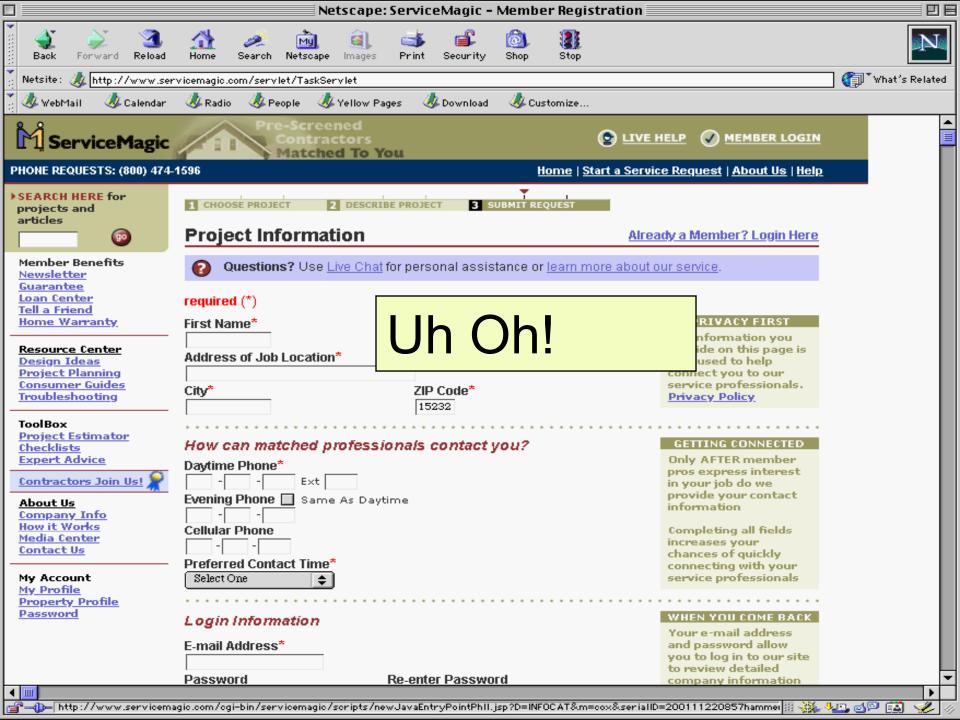




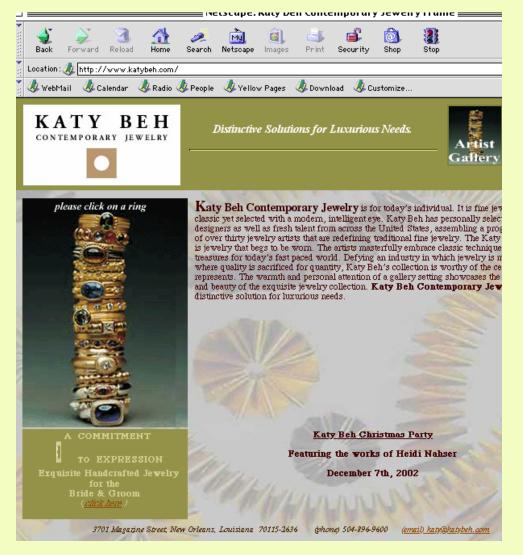








Beautiful site but difficult to shop



Click on a ring to navigate

KATY BEH CONTEMPORARY JEWELRY

Distinctive Solutions for Luxurious Needs.









Katy Beh's Essential Gift Portfolio

Katy Beh's Essential Gift Portfolio offers you a unique collection, hand selected by Katy, to solve your gift giving needs.

Please visit this site frequently during gift giving seasons, as we will update the choices as our artists create new pieces.



Pillow Collection By Michele Mercaldo

18k Yellow Gold and Sterling Silver

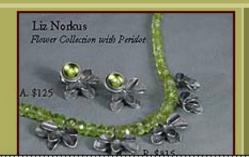
Poppy Collection
By Darriea Segal

Sterling Sliver with Pink Pearls



Peridot Petal Collection By Liz Norkus

Oxidized Sterling Silver with Peridot



To place an order

Please call or e-mail us!

1-504-896-9600 (Monday through Saturday, 10am-5pm CST)

Practical Tips



- Quality of links
- Links inspire confidence through
 - » Type of link
 - » Amount of information
 - » How the link is organized with other links

Types of links

- Content link (goes to pages containing content)
- Category link (goes to pages containing mostly other links)
- Keyword link (search; what the user types)
- Back or home link

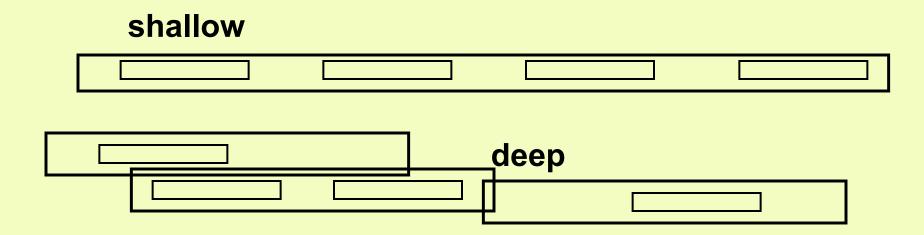


Arts and crafts seasonal

Places an

Content links work best

- Users are more likely to be successful when they use content links
 - » But most sites have more category links
- Back/Home are a symptom of a problem
 - » User has lost the scent
- Can you create more content links?
 - » Suggests shallow architecture



Link Organization Organization affected by

- Grouping
- Structuring
- Differentiating
- Avoiding links altogether

Grouping

- Users perceive items in close proximity are related
 - -Increases confidence before clicking
- Web pages with more groups of links do better
 - -Groups of content links do MUCH better

Groups of links

House Floor This Week Y House Floor Now

Y Senate Schedule

THOMAS

Legislative Information on the Internet

Search CURRENT CONGRESS for Text of Bills:

By Bill Number

By Word/Phrase

Search

Clear

LEGISLATION

Bill Summary & Status:

106th or Previous

Bill Text:

106th or Previous

Major Legislation:

Definition

106th or Previous

Public Laws By Law Number: 106th or Previous

Roll Call Votes: House (Help) Senate (Help)

CONGRESSIONAL RECORD

Congressional Record Text:

Most Recent Issue 106th or Previous

Congressional Record Index:

106th or Previous

Résumés of Congressional Activity:

Previous

Days In Session Calendars:

Previous

COMMITTEE INFORMATION

Committee Reports: 106th 105th

104th

Committee Home

Pages:

House or Senate

House Committees:

Schedules and Oversight Plans

Hearing Transcripts Committee Jurisdictions

Senate Committees:

Hearings Schedule

Structuring

- Structure provides a way to assess completeness of the content
 - » What's here
 - » What's missing (know when to stop looking)
- Helps users scan

Structured lists

For a great introduction to the Greek world, check out Thomas Martin's **Overview of Archaic and Classical Greek**<u>History</u>. This work contains over 3000 links to Perseus' primary materials and is also available as a book from <u>Yale</u>

<u>University Press</u>. Also check out <u>highlights</u> of the Perseus Web site.

Catalogs of sites, buildings, and objects



Architecture Catalog All images are assulable.



Site Catalog All images are assuitable. Also with clickable site plans.



Coin Catalog Images from the <u>Arthur S. Dewing Collection</u> assailable to all



What constitutes structure?

- Common taxonomy
 - » Does the user know it?
- Familiar domain
 - » Car manufacturers, sports teams
- Hierarchy
 - » Alphabetizing alone often does not convey structure.

Differentiating links

- Links that lead to different content need to make their differences clear
 - » Links that aren't well differentiated from each other make it harder to choose.

Round Trip

One Way

Multiple Destinations

ct a fare search option.

- Travelocity best fare finder: Search for the lowest fares offered and show me the dates I can travel. Only for economy class travel within or between the United States, the U.S. Virgin Islands, Canada and Puerto Rico.
- 9 Best Itineraries: My travel dates are not flexible but my travel times are. Search for the nine best-priced itineraries for my date(s).
- Search by Schedule: I need to travel on specific dates and times. Search all flights so that I can build my own itinerary, then show me the total price. (Travelocity will also find up to three lower-cost alternatives.)

Why do brackets, indents, and bullets help?

- Help users chunk information
- Help with scanning
- Help users distinguish links from each other.

Money Market Funds

Money Market

Federal Municipal Money Market

State Municipal Money Market

Users thought there were 4 funds here

printable version



home and home office

hello, this is your connection to hp. learn, shop, and create.

home and home office

- → search
- → contact hp

home and home office.

- products
- → personal services
- → creative projects
- → technology tips
- digital living
- → special offers
- → registration and profiling
- → subscriber's choice: driver updates and more
- → support and troubleshooting

products

computing

- desktops
- → notebooks
- → handhelds

printers

- → inkjet.
- → LaserJet
- → multifunction & all-in-one

photo & imaging

- digital cameras
- scanners

supplies & accessories

- supplies by printer.
- printer accessories

product support

- driver downloads.
- → troubleshooting
- → warranty upgrades.

creative projects

- projects for every occasion
- → card studio
- seasonal

special offers

- national offers and promotions
- great deals from **HPShopping**
- internet service providers

learning library

- technology tips
- community
- online training courses



→ buy direct online \underset



FREE shipping useful things

on orders of \$250 or more



hpshopping

hp subscriber's choice your connection to ...



comes with MS Windows XP and

internet serv

→ n5425 notebook

→ 568 iornada

things to do and see



→ thanksgiving kid's table

Even adults will want to sit at the kid's table with

HP's differentiation is better



see in color and store more files with this powerful pocket pc!



→ digital living

Dive into articles, how-to demos, interactive games, product tools, and more at HP's new website "digital living". You1ll be amazed at where you can go.



Redundant links

- Redundant links lead to the same page
- They support users with:
 - » Different backgrounds
 - » Different contexts
 - » Different goals
- Fit with research on multiple entrances
- Give multiple scents to a single target

Redundant links...



Three links to the same page



No links

Using new technology (e.g., Flash) to avoid links: Example http://www.vwasia.com/start/visualiser/index.html, Configure a car without following multiple links.

- See the whole picture
- •Fill in forms in any order



Conclusion

- Links must offer & maintain scent
 - » Link following is a major source of success in web navigation
- Topics not covered today: content design, page design, use of technologies, community.
- Technology, businesses, and usability are changing fast. (Examples in this lecture could be outdated by next year.)
- Guidelines interact with content. Theory is just at a beginning stage. Therefore you must do user testing.