

Site Design

SWE 432, Fall 2019

Web Application Development

Quiz

Go to:

b.socrative.com, Click student login

Room name: SWE432

Student Name: Your G-number (Including the G)

Reminder: Survey can only be completed if you are in class. If you are not in class and do it you will be referred directly to the honor code board, no questions asked, no warning.

Today

- How do you help users understand if it is possible to do what they'd like to do?
- How do you help users find what they're looking for?
- How do you organize information in a site to maximize efficiency?

Site design

- If users can not find what they are looking for, they will leave.
- If users take a long time to find things, your software is not usable.
- Site design considers how users interact with information, including organization, labeling, and search

Site Design vs Real World

- Challenges (differences from physical world):
 - No spatial sense of scale. 50 pages? 500 pages? 50,000 pages?
 - No sense of direction. Which way did I just go?
 - No sense of location. No spatial anchoring of where I am now and how that relates to where I could go.

Planning

- Help users determine what they **can** do
- Support users in how they **determine** what to do

What can
you do with
this app?

CSS-TRICKS

Articles

Videos

Almanac

Snippets

Newsletter

Jobs

Guides

e.g. flexbox

Fresh Article

November 13, 2019

Thoughts After Looking at the Web Almanac's Chapter on CSS

Author

Chris Coyier

1 Comment

Join the Conversation →

Woah, I didn't see this coming! The HTTP Archive dropped this big "state of the web" report called Web Almanac with guest writers exploring data from 5.8 million websites.

Una Kravetz and Adam Argyle wrote the [CSS chapter](#). The point is to squeeze a digestible amount of insight out of a mountain's worth of data. So there is some irony here with me squeezing in my thoughts about this chapter for an even quicker read, but hey, here we ...

[Read article](#)

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Article Oct 23, 2019

Why Are Accessibility Websites so Hard to Build?

Author

Robin Renard

ACCESSIBILITY

PERFORMANCE

Article Nov 1, 2019

Become a Front-End Master in 2020: These 10 Projects

Author

Chris Coyier

LEARNING

Article Oct 28, 2019

A Business Case for Dropping Internet Explorer

Author

Ollie Williams

CROSS-BROWSER

INTERNET EXPLORER

Article Nov 4, 2019

The Trick to Adding the Dot on the "i" in Italic

Author

Ali Churchill

CSS ANIMATION

UNICODE

Article Oct 7, 2019

Introducing Sass Modules

Author

Miriam Storer

MODULES

SASS

Article

Web Bad

Author

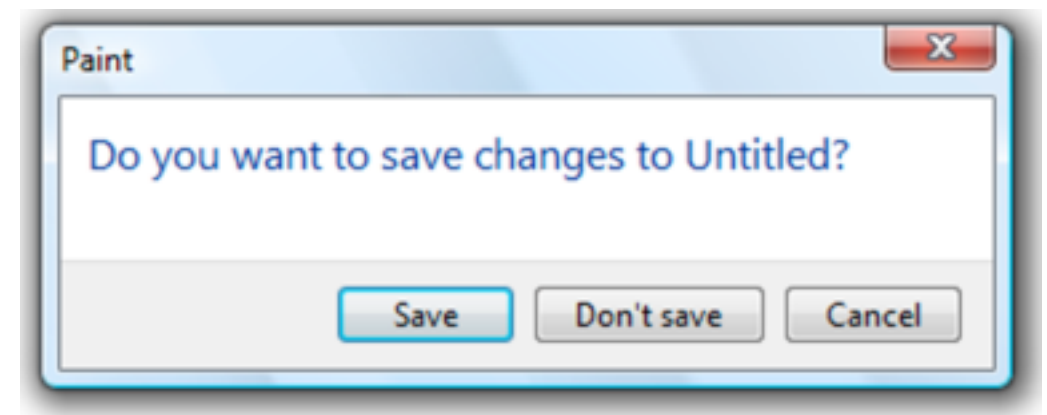
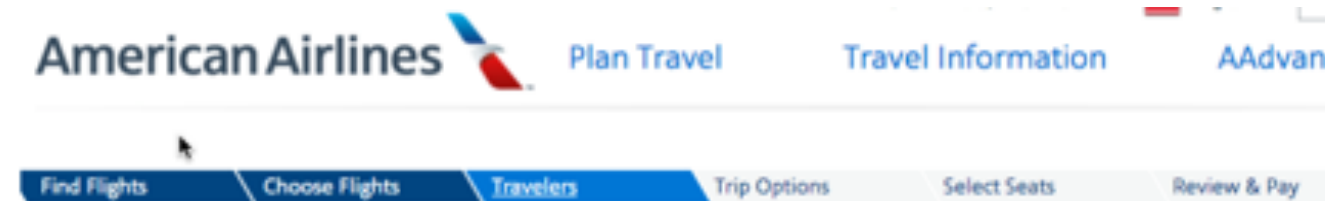
LaToza

Clear system task model

- Help users accomplish goals by providing clear model of how users should view system in terms of tasks
- Design to match users' conception of high level task organization
- Help users understand what features exist and how they can be used
- Help users decompose long tasks into small pieces
- Keep task context visible to minimize memory load

Effective planning

- Help users plan most efficient ways to complete tasks
- Keep users aware of task progress, what has been done and what is left to do
- Provide constraints to avoid transaction completion slips
 - e.g., prevent users from starting task and accidentally throwing away work mid-task



Orchestration & interaction flow

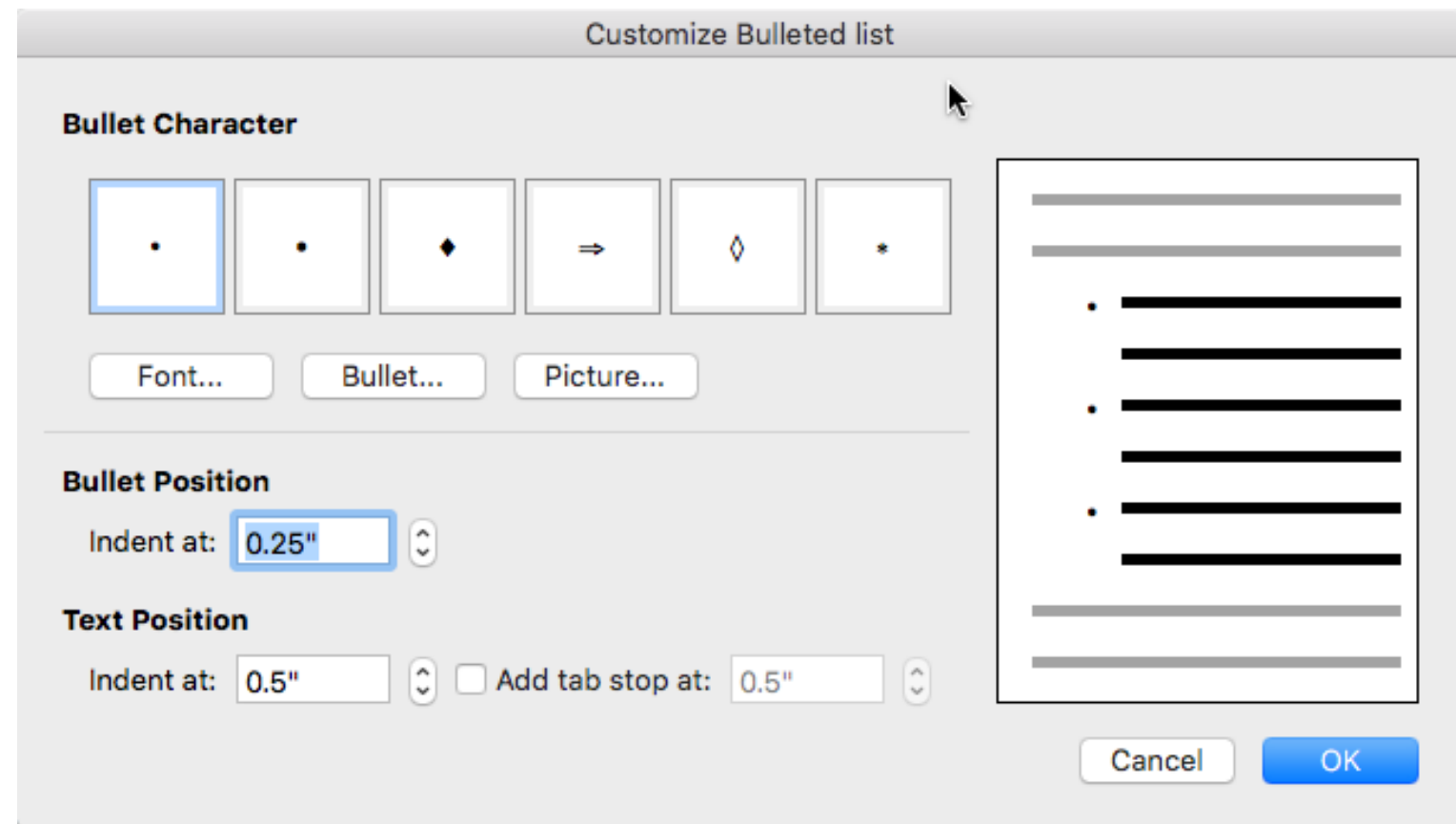
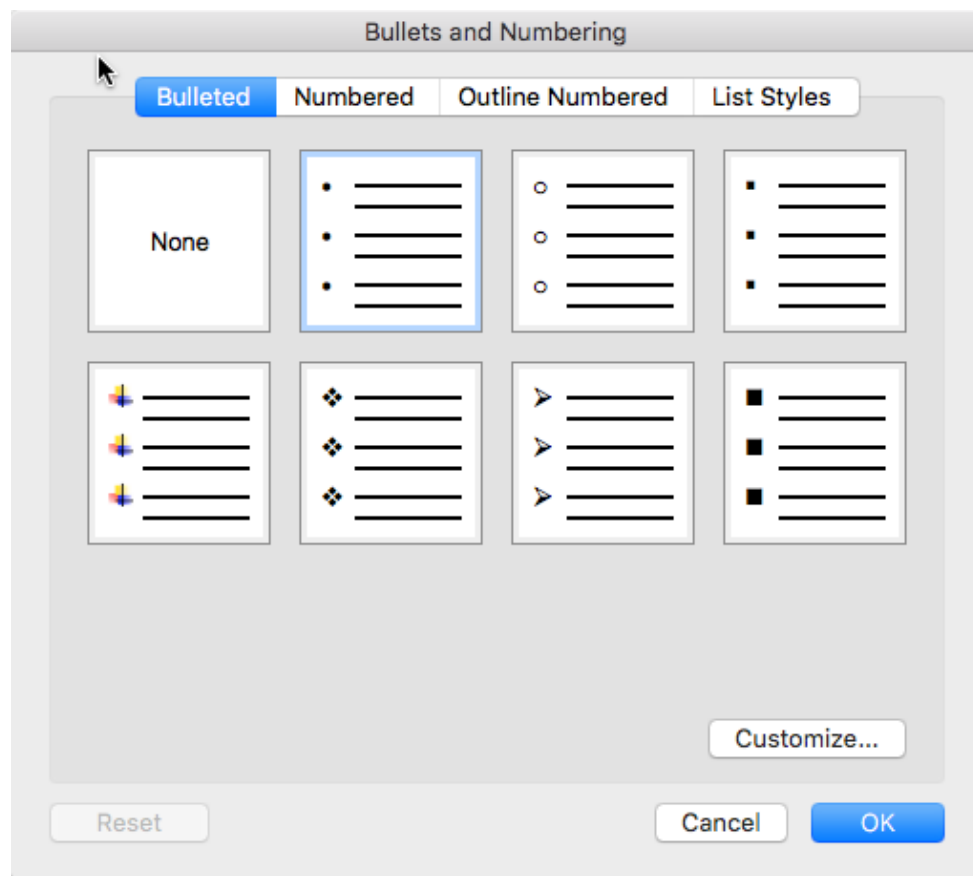
- Interaction flow - the next thing the interface wants to do is exactly what user expects
 - Follow users' mental model
 - Let user direct software
 - Keep all related tools available
- Surprises interrupt interaction flow
- Interfaces should be invisible

Interaction flow guidelines

- Don't use dialogs to report normal behavior
- Separate commands from configuration
- Don't ask questions, give users choices
 - Give users default input, show possible options
- Make dangerous choices hard to reach
- Design for the probable, provide for the possible

Progressive disclosure

- a.k.a. details on demand
- Separate information & commands into layers
- Present most frequently used information & commands first



Metaphors & idioms

Metaphors

- One way to communicate interaction techniques is through metaphors to the real world



Metaphors - advantages

- Leverages understanding of familiar objects & their functions
 - File cabinets, desks, telephones
- Provides **intuitive** understanding of possible affordances & eases mapping tasks to actions
 - Open a folder, throw file in trash, momentum scrolling

Metaphors - disadvantages

- Tyranny of metaphor: ties interactions closely to workings of physical world
- Adds useless overhead in extra steps, wastes visual bandwidth
- Taken literally, becomes non-sensical
 - e.g., nesting folders 10 levels deep



Alternative - Idioms

- A consistent mental model of how something works
 - e.g., Files: open / close / save / save as
- Offers intuitive understanding of affordances & interactions
- Provides consistent vocabulary for describing interactions
- Only have to learn it **once**
- Might have originated in real world, but thought of in terms of mental model for UI interactions

Exercise: Examples of idioms

Examples of idioms

- Email
- Clipboard: cut / copy / paste
- Format painter
- Newsfeed
- Follow item

Metaphors examples - piles

- The context: Apple Computer, 1992, 3 researchers (Richard Mander, Gitta Salomon and Yin Yin Wang)
- The design problem: How should computers help users organize and file information?
- The method: How do users organize and file information best *without* computers?

Computer users are confronted with large amounts of information, but **currently are only provided with a hierarchical filing system for managing it [folders]**.

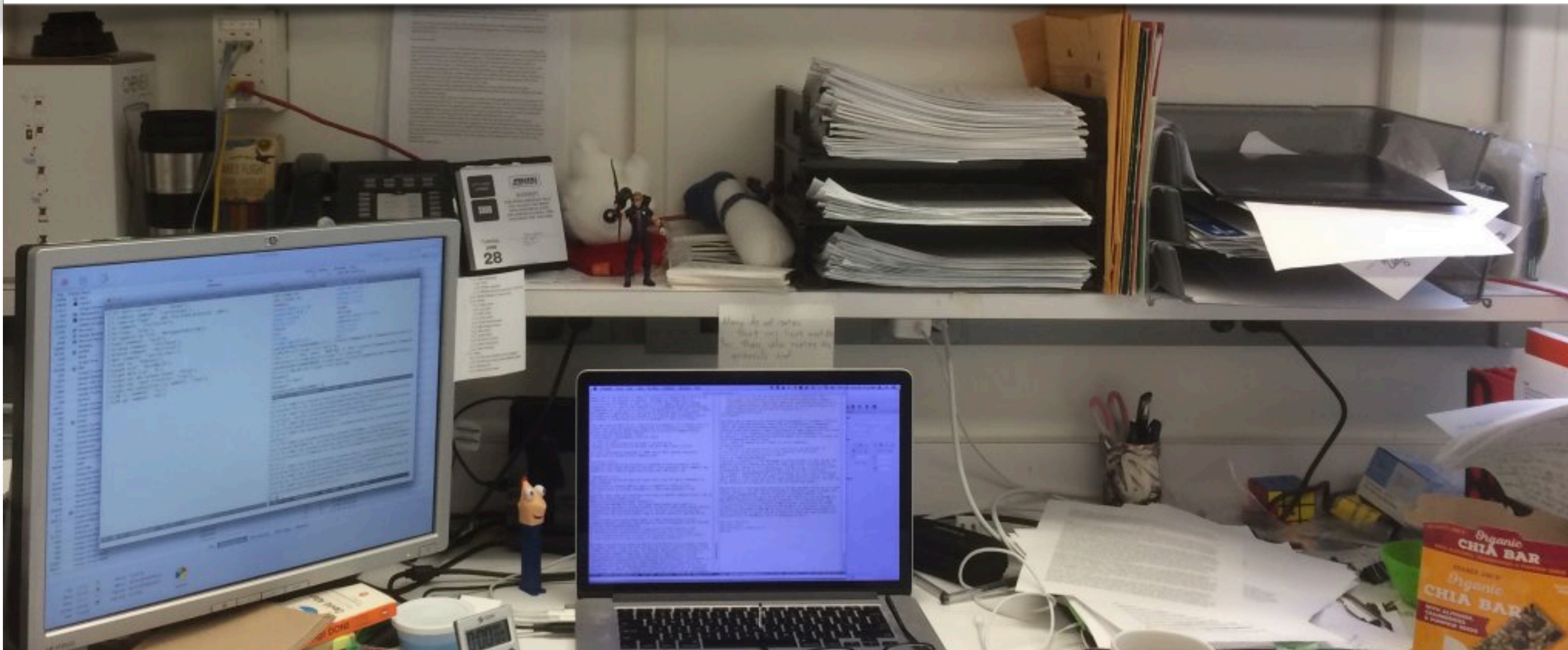
Piles - Methodology

- Interview 13 Apple employees in different departments for 30-60 minutes
- Studied:
 - How does information arrive in your work area?
 - What do you do with information once you get it?
 - Where does it go next?
 - Where and how is it stored?
 - How do you work with (or would work with) an **assistant**?

Piles - Study Results

- Users used many artifacts like:
 - Folders
 - File cabinets
 - File racks
 - Binders
 - Piles
- Problems with filing in folders/cabinets:
 - “I’m not always as good at categorizing things as I would like...it’s hard to get it right and I’m sort of a perfectionist, so I think that I should know exactly how I should do it...I like things in their place, but I can’t figure out exactly what place.”

“Seemingly disordered piles were often sensible to the person who created them, because they developed through many interactions over a long period of time.”



“...Most workers kept information they needed in a specific working area. A common strategy was to create separate piles for each project and place them within the working area, at distances that reflected their urgency.”

Piles as a Design Metaphor

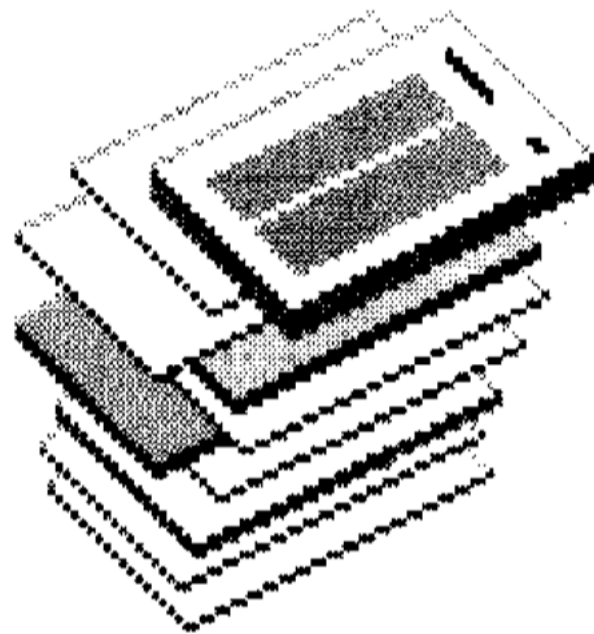
- Insight: Many tasks do not rely on hierarchy of files (e.g. organization in folders in cabinets)
 - Note, not first to suggest metaphor of piles, Thomas Malone (Xerox PARC) described nearly 10 years earlier in 1983
- How do workers use piles?
 - Edge browse - find cues from the edge of a pile (thickness, color, texture)
 - Restack - Start at the top, browse down by removing things
 - Hinge - Unfold the pile like a binder
 - Spread out - See all/many items at once

Assistance with Information Management

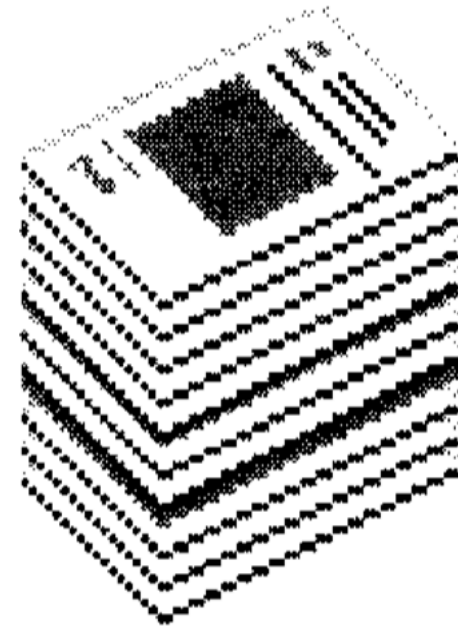
- Most participants in the study did not have an assistant but mentioned that they wanted one, why?
- Assistants might:
 - Sort incoming data into categories
 - Filtered incoming data
 - Create piles
- All **in collaboration with** the worker
 - “I’ll go into his office and put [labels] on piles on his floor and he’ll look at it and say ‘no’ or he’ll say ‘that’s pretty good’.”

Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
 - System-created piles



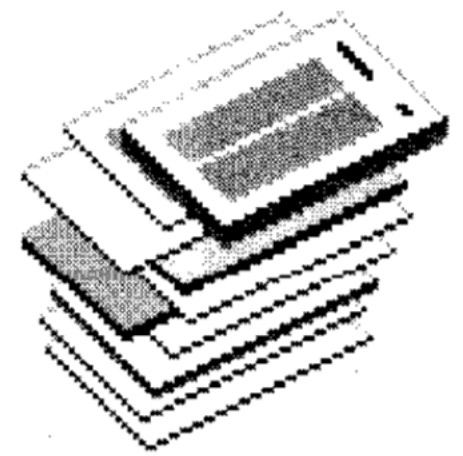
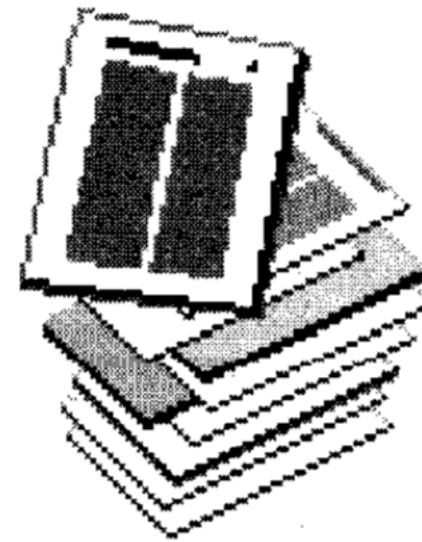
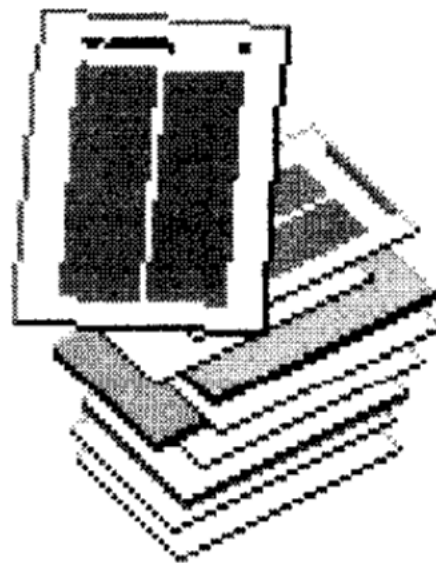
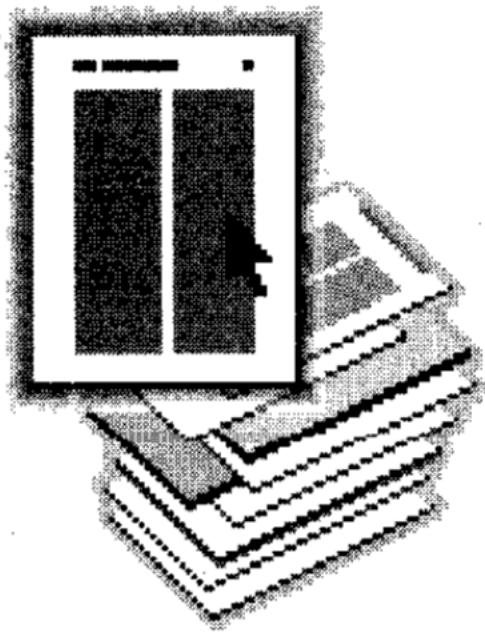
User-created pile
(messy)



System-created
pile (Organized)

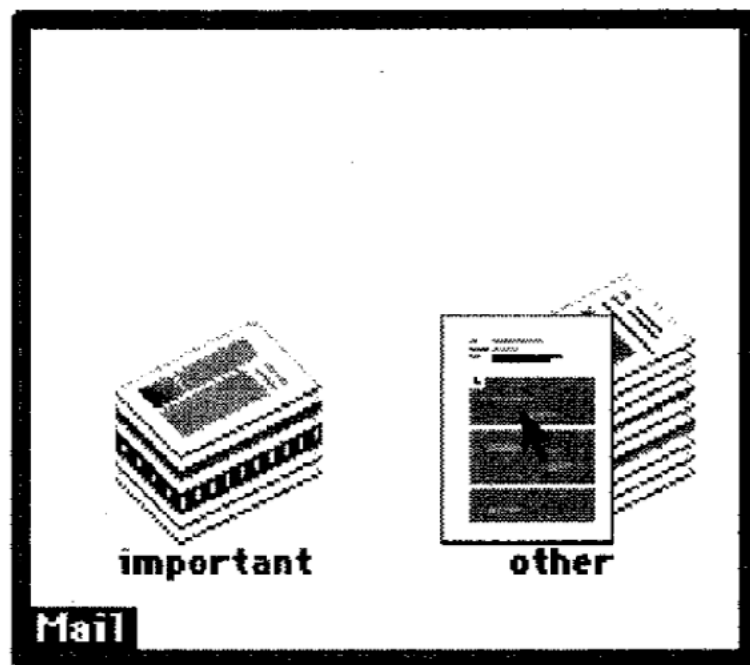
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
 - New files added to the pile are directly visually represented

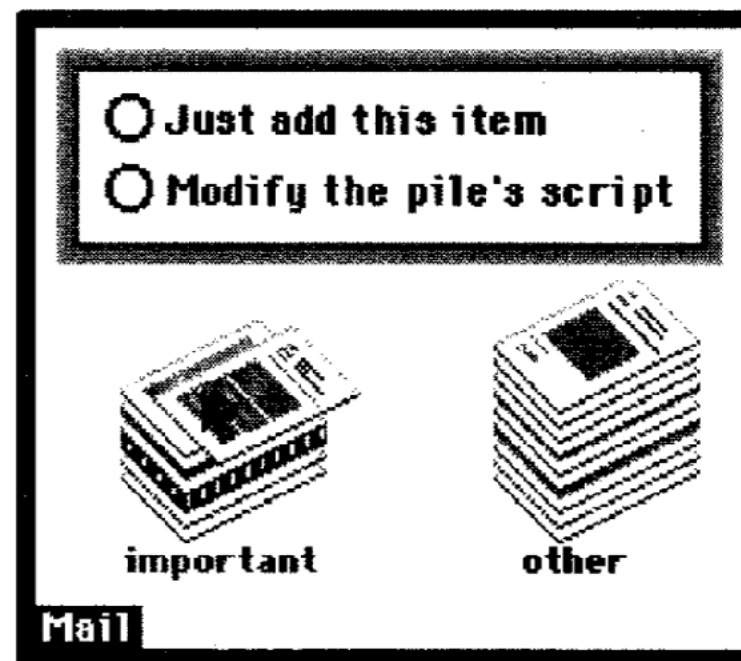


Piles - Sketches

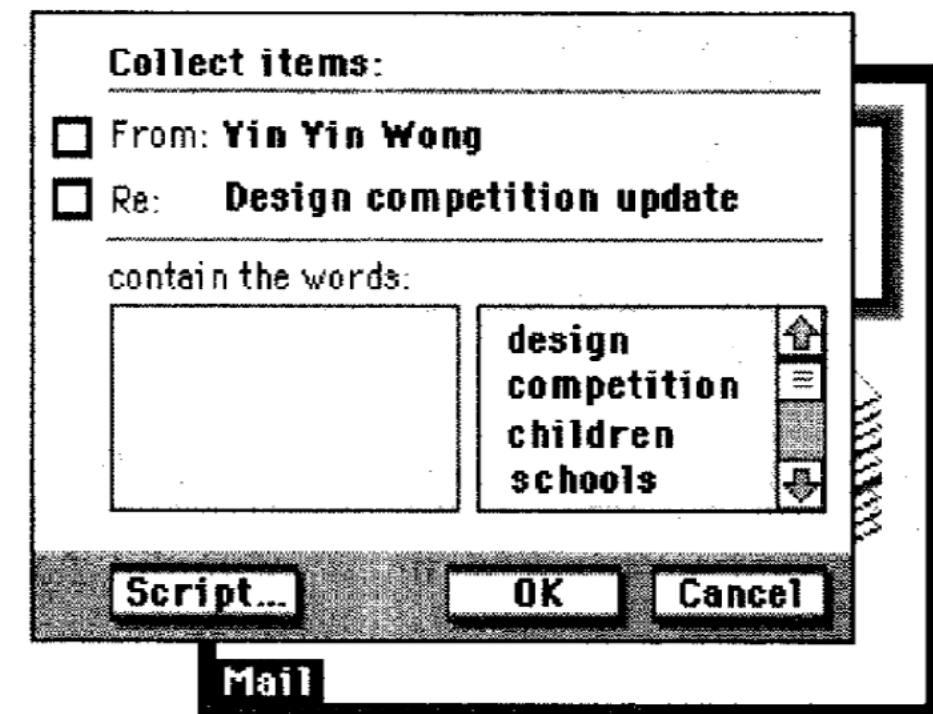
- Created sketches to facilitate discussion and evaluation
- Example features:
 - System-user collaboration for defining rules



Select an item from
a pile



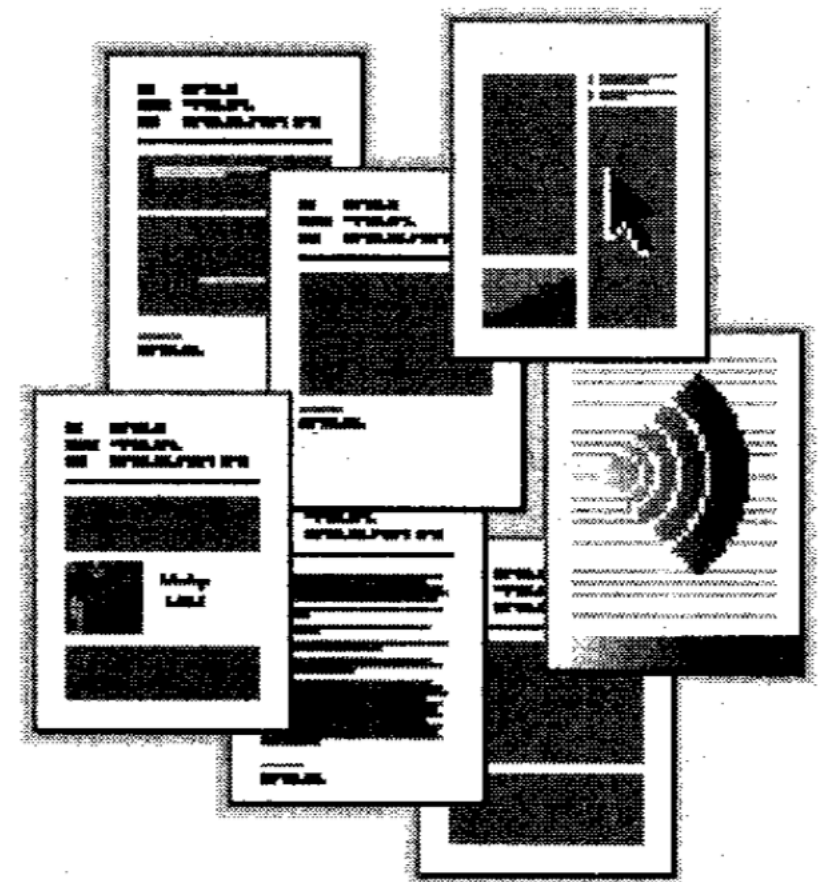
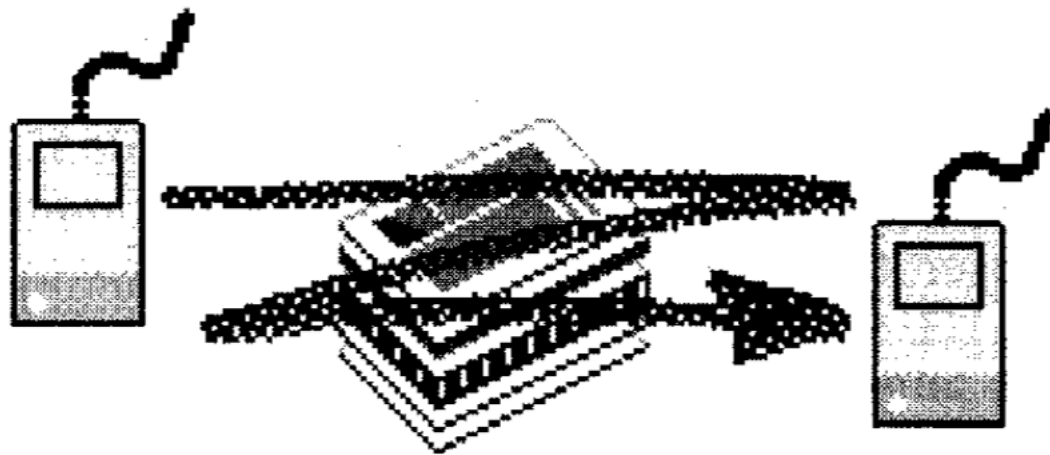
Move to new pile



Update pile script

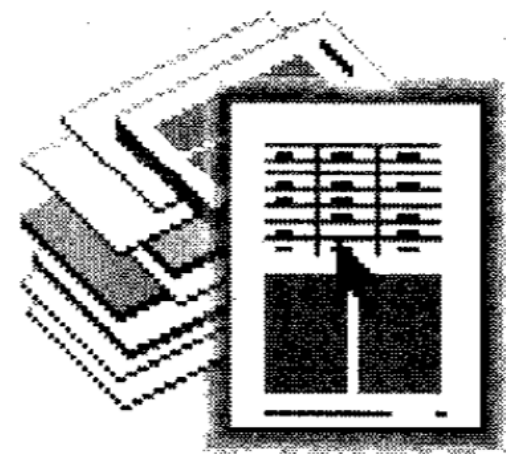
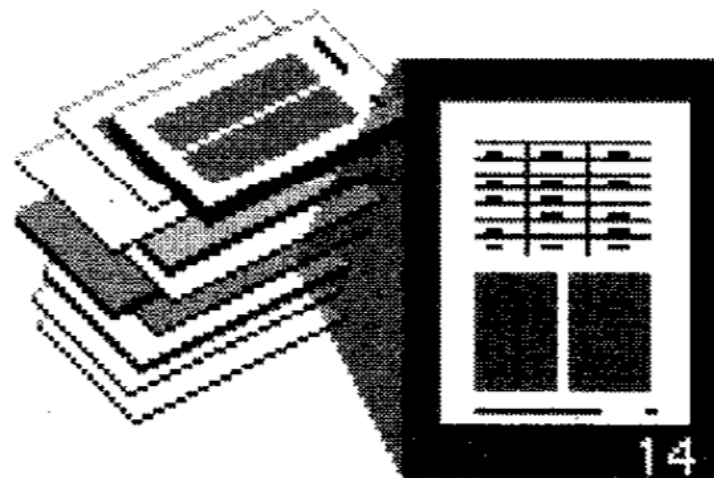
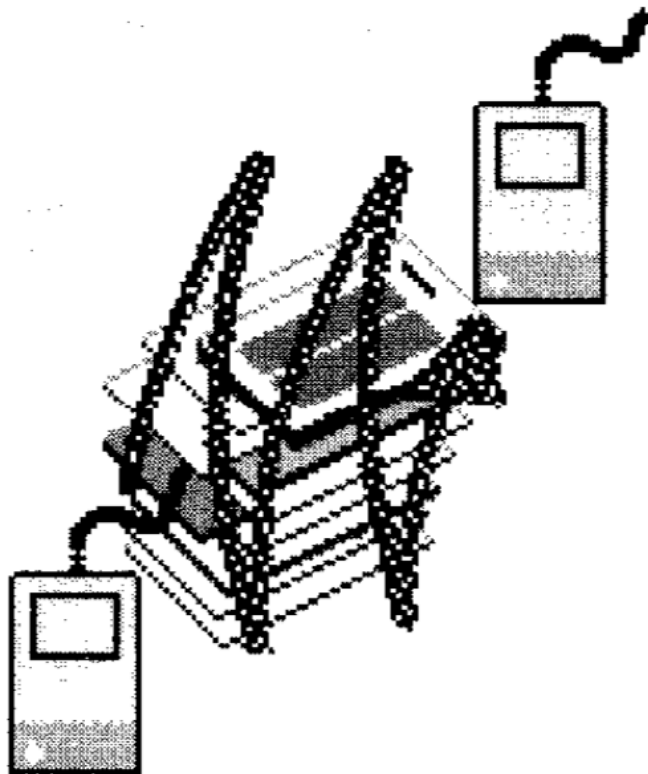
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
 - Browsing by spreading a pile out



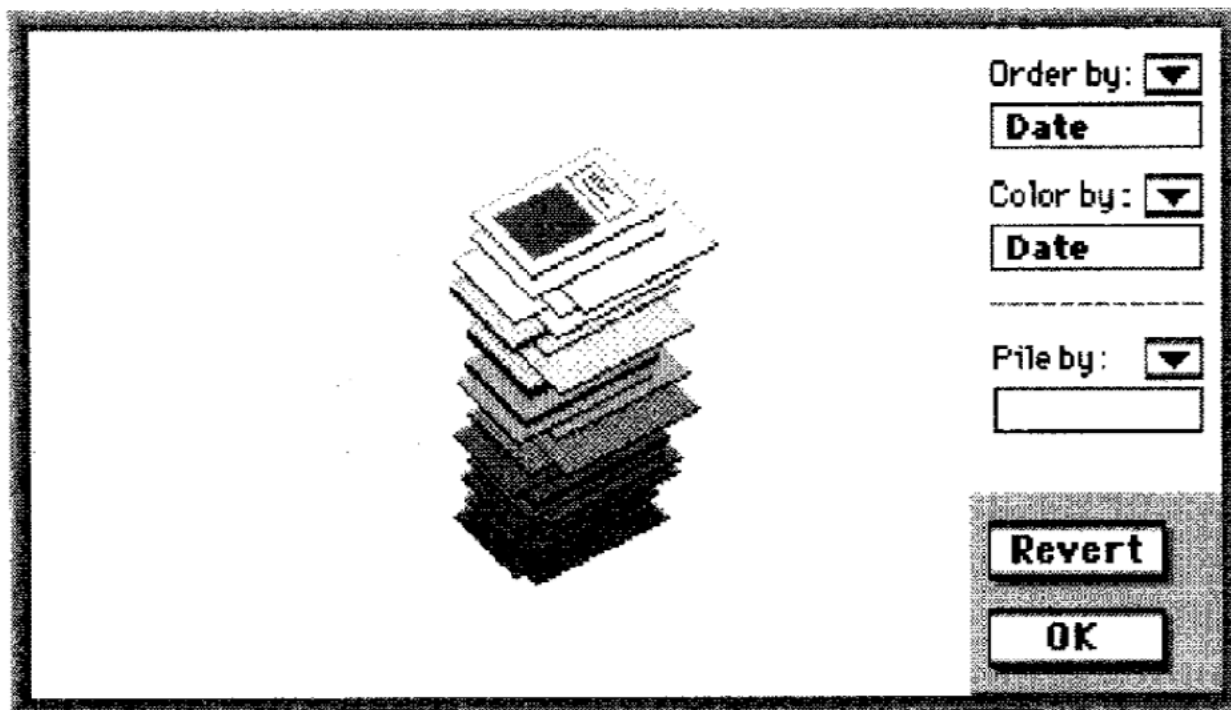
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
 - Browsing and maintaining structure (kind of like hinge)

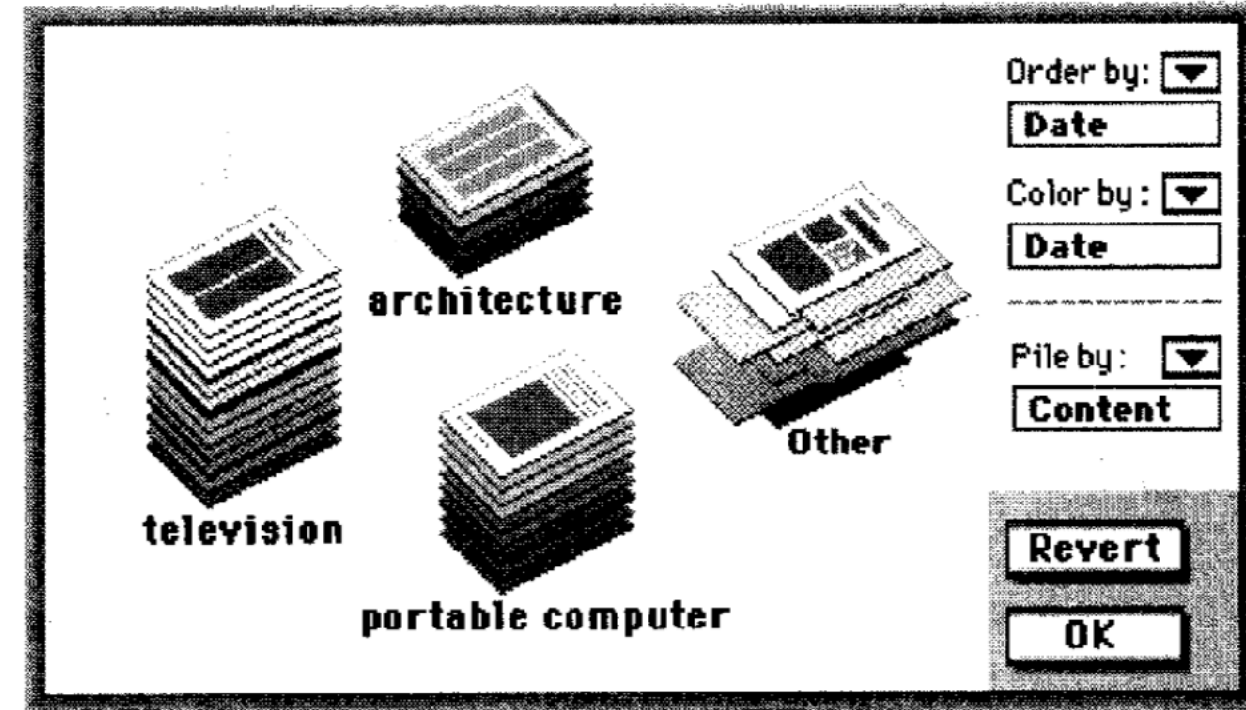


Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
 - Visualizing the contents of a pile



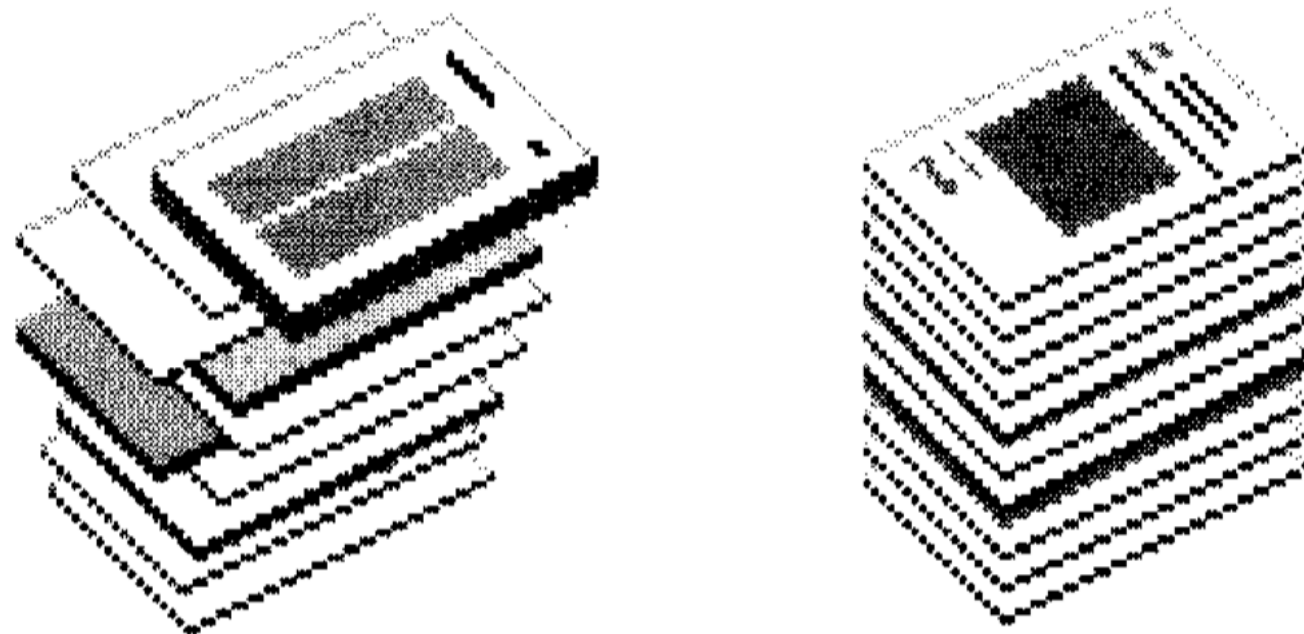
All data, ordered and colored by date



All data, ordered and colored by date, piled by content

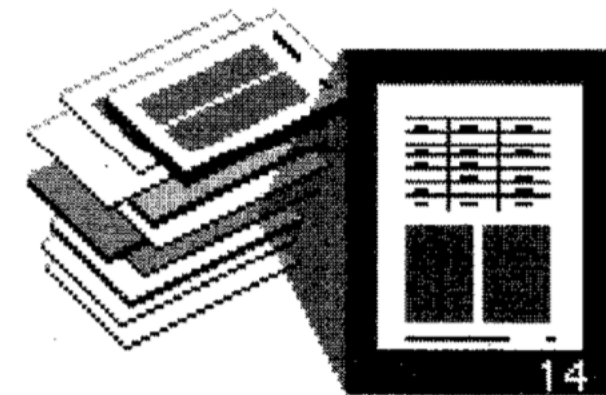
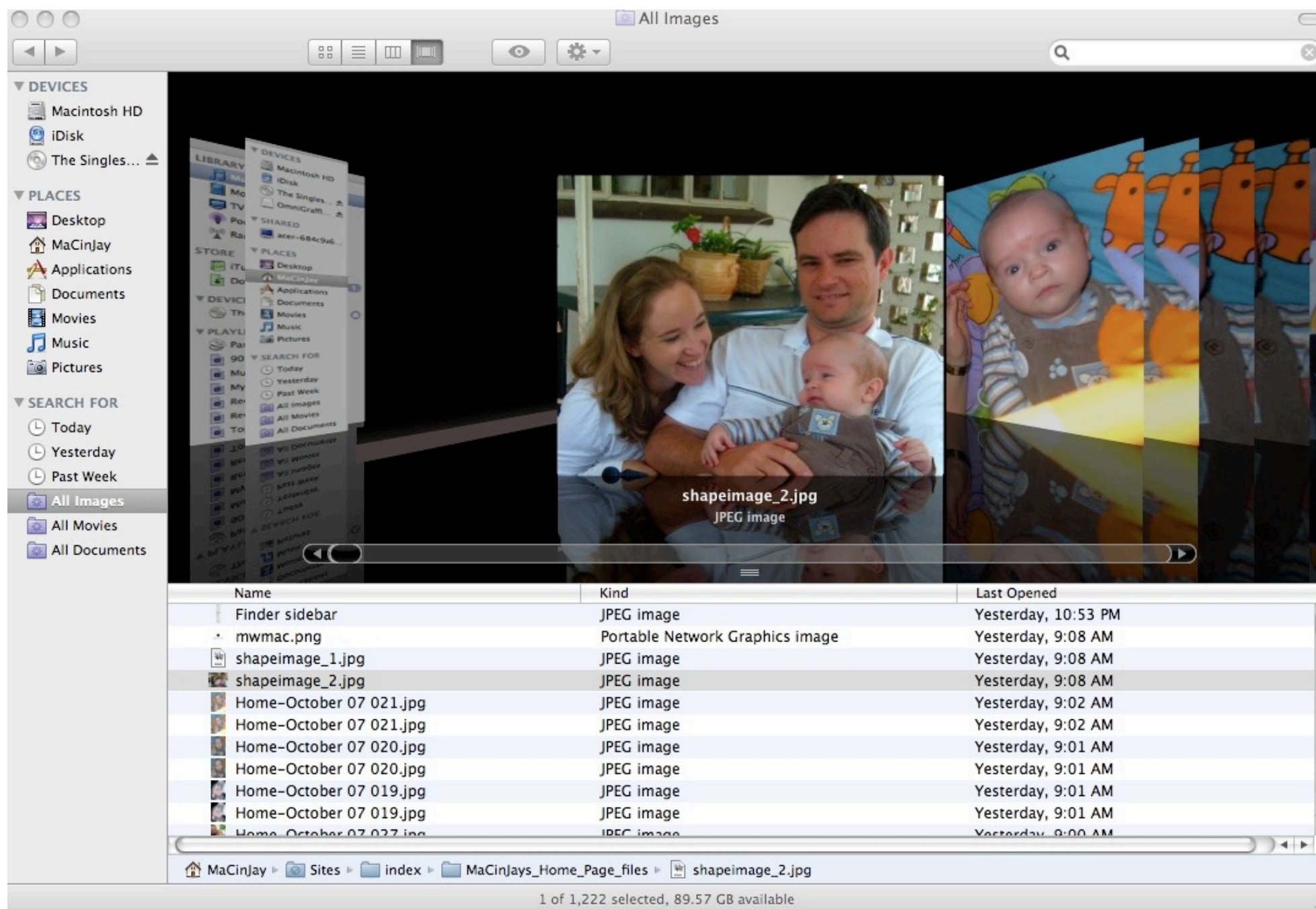
Piles - Evaluation

- Built prototypes, conducted studies
- What do YOU think are good/bad things about this metaphor?



Piles - Legacy

- Patent issued to Apple in 2001
- 2007 (OS 10.5) introduced Cover Flow



Piles - Legacy

- Patent issued to Apple in 2001
- 2007 (OS 10.5) also introduced stacks

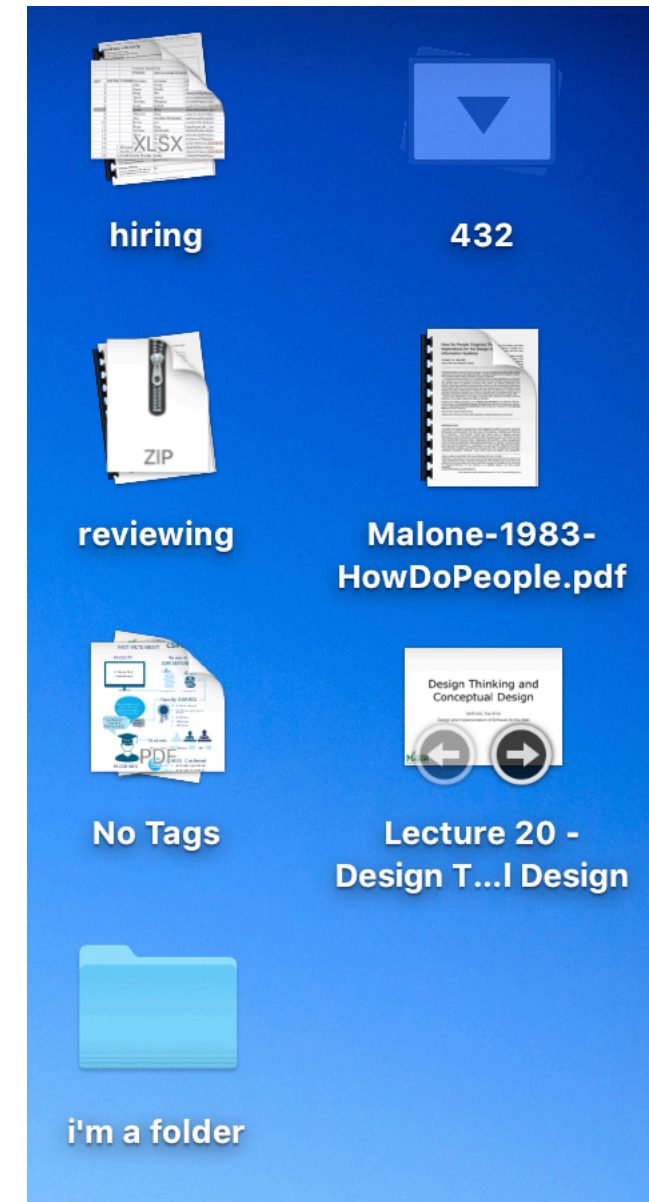
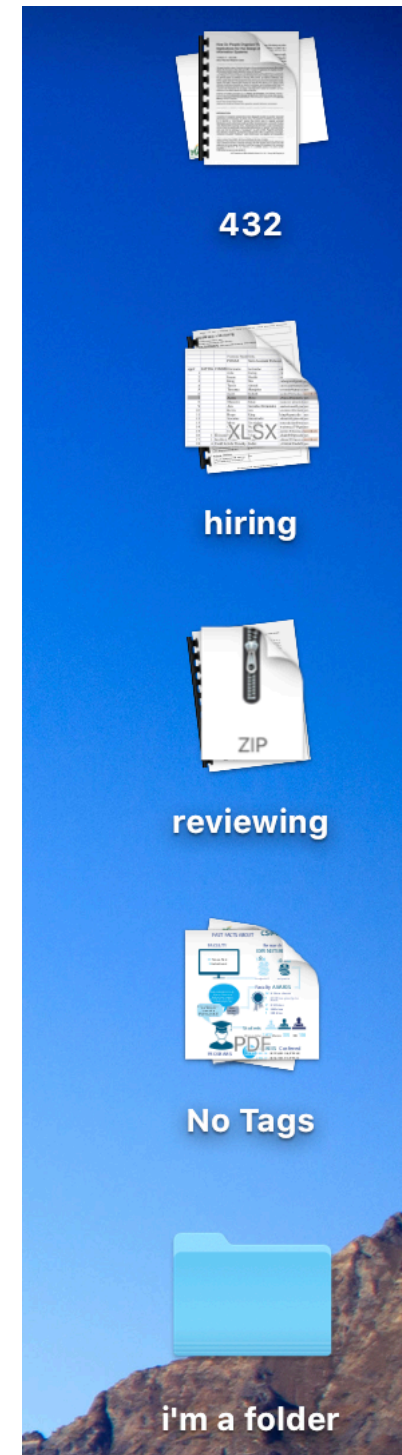
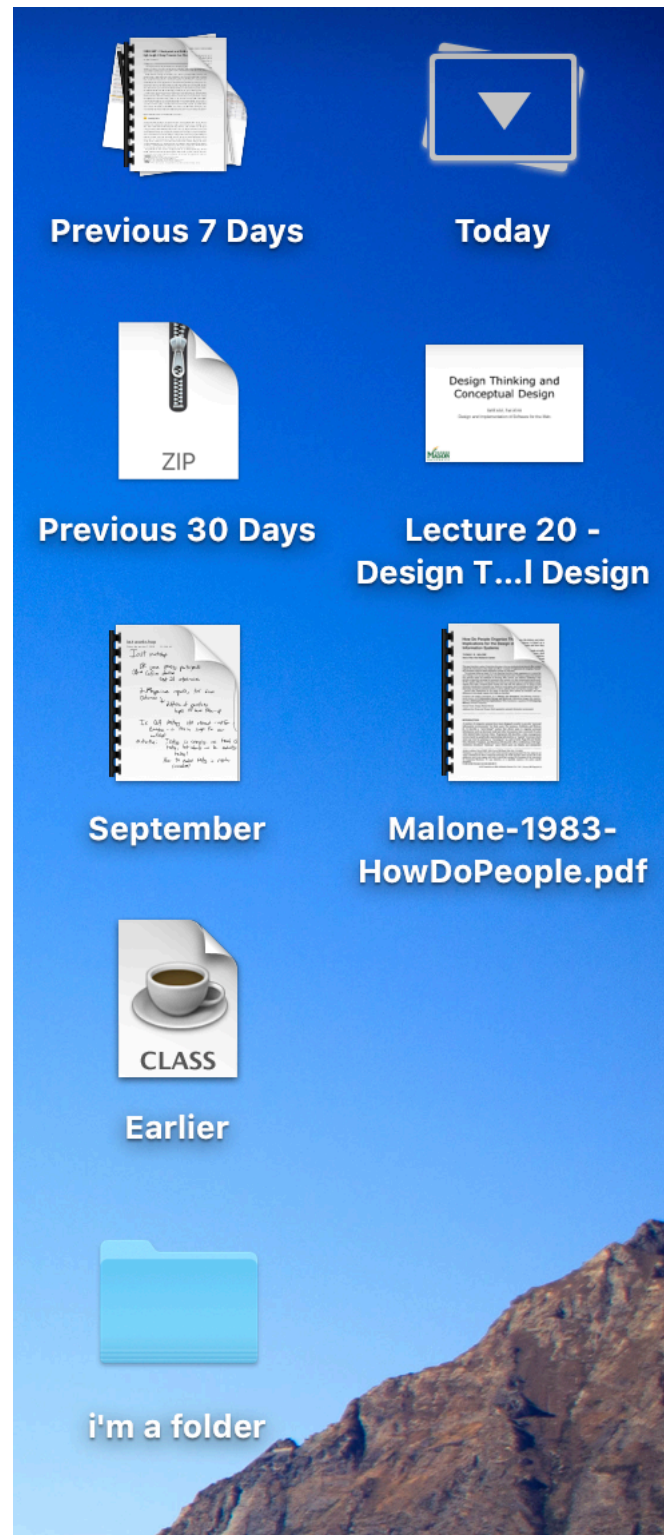
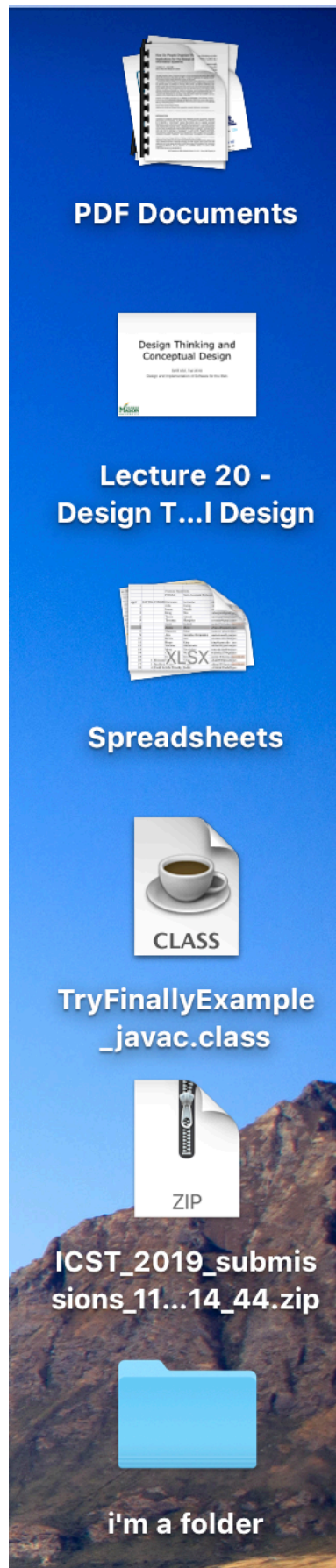


Piles - Legacy

- Patent issued to Apple in 2001
- 2018 (OS 10.14) introduces desktop stacks



Desktop Stacks



Open a stack

Stack by kind Stack by last opened Stack by tag

Task Structure

Task structure

- Flow of tasks and task steps
- Task design simplicity, flexibility, efficiency
- Maintenance of locus of control
- Direct manipulation

Separate long tasks into sequences

- Reduce short term memory demands by having user only work on one aspect of larger task at a time
- Don't interrupt users in the middle with unrelated tasks
- Provide closure of each subtask at the end

The screenshot shows the American Airlines website interface during a flight booking process. The top navigation bar includes the American Airlines logo, links for 'Plan Travel', 'Travel Information', and 'AAdvantage', along with user account options like 'Home', 'Login', and 'Hello, THOMAS'. A search bar is also present. Below the navigation bar, a progress bar indicates the current step is 'Travelers', with other steps like 'Find Flights', 'Choose Flights', 'Trip Options', 'Select Seats', 'Review & Pay', and 'Finish' visible. The main content area is titled 'Travelers' and includes a warning icon and text: 'Check below for errors'. A flight summary box displays the route 'Washington to Raleigh/ Durham' for '1 Adult' on 'Sunday January 10, 2016 – Monday January 11, 2016'. To the right, the 'Your Trip Price' is shown as '\$203.70 USD', with a link for 'Baggage and Optional Charges'. A 'Show Trip Details' button is located below the flight summary. At the bottom, there is a promotional banner for AAdvantage miles and a statement credit, and a section for 'Passenger Details' with a note about entering names as they appear on government-issued photo identification.

American Airlines Plan Travel Travel Information AAdvantage

Home Login Hello, THOMAS English Search aa.com

Find Flights Choose Flights **Travelers** Trip Options Select Seats Review & Pay Finish

Travelers

Check below for errors

Washington to Raleigh/ Durham
1 Adult
Sunday January 10, 2016 – Monday January 11, 2016

Your Trip Price: **\$203.70 USD**
[Baggage and Optional Charges](#)

Show Trip Details

Earn 40,000 bonus miles,
up to \$100 in statement credits, and your **first checked bag free***
[Learn More](#)

Your Trip Price: \$203.70 USD
Statement Credit: - \$100.00 USD
\$103.70 USD

Passenger Details

Please enter all passenger names as they appear on the passenger's government-issued photo identification. [More details on passenger names](#)
[TSA Privacy Notice](#)

*Required

Design for flexibility & efficiency

- Users may take paths never envisioned by designer
- Using studies to identify different task flows, design flexible support for each

Home Login Hello, THOMAS English Search aa.com

American Airlines Plan Travel Travel Information AAdvantage oneworld

Find Flights Choose Flights **Travelers** Trip Options Select Seats Review & Pay Finish


Travelers

⚠ Check below for errors

✈ Washington to Raleigh/ Durham
1 Adult
Sunday January 10, 2016 – Monday January 11, 2016

Your Trip Price:
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[Baggage and Optional Charges](#)

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Statement Credit: - \$100.00 USD
\$103.70 USD

Passenger Details

Please enter all passenger names as they appear on the passenger's government-issued photo identification. [More details on passenger names](#)
[TSA Privacy Notice](#)

*Required

Delta: Flight Booking, New User

delta.com

NEED HELP? | COMMENT/COMPLAINT?

DELTA SKYTEAM

SHOP ▾ TRAVELING WITH US ▾ SKYMILES® ▾ Search

MY TRIPS BOOK A TRIP FLIGHT STATUS CHECK IN

SIGN UP LOG IN

BOOK A TRIP BEST FARE GUARANTEE

Start Over Flights Passengers Extras Payment

PASSENGERS *REQUIRED

1 Passenger 1

Please make sure your full name is entered exactly as it appears on your government-issued identification. This [Secure Flight Passenger Data](#) is for use by the [Transportation Security Administration](#) only.

PREFIX *FIRST NAME MIDDLE NAME *LAST NAME SUFFIX

FREQUENT FLYER PROGRAM FREQUENT FLYER NUMBER

*GENDER *DATE OF BIRTH KNOWN TRAVELER NUMBER REDRESS NUMBER

Contact Information

*DEVICE TYPE *COUNTRY *PHONE NUMBER

*EMAIL *CONFIRM EMAIL ADDRESS

You will receive [flight and mishandled baggage notifications](#) via the contact information entered above.

☐ My company is a [Delta SkyBonus®](#) or [Air France/KLM BlueBiz®](#) program member.

START OVER Skip to Payment NEXT: TRIP EXTRAS

Delta: Flight Booking, Existing User

The screenshot shows the Delta website's flight booking interface for an existing user, Jonathan Bell. The page is titled "BOOK A TRIP" and features a "BEST FARE GUARANTEE" badge. The user's name, "Jonathan Bell", is displayed in the top right corner. A yellow box highlights the "Express Checkout" button in the top right corner. The main content area displays two flight options: a round trip from DCA to ATL on Friday, December 2nd, and from ATL to DCA on Sunday, December 4th. The flights are operated by Delta 1333 and Delta 1911, respectively. The price per passenger is \$406.51, and taxes, fees, and charges are \$58.69. The total price is \$465.20 USD. Below the flight options, there is a section for "PAY WITH MILES" and a "MILEAGE CALCULATOR" button. The "PASSENGERS" section is highlighted with a yellow box and contains a form for "Are You Traveling?". The form includes fields for "Passenger Information" (Prefix, First Name, Middle Name, Last Name, Suffix, Frequent Flyer Program, Frequent Flyer Number, SkyBonus/BlueBiz Number, Gender, Date of Birth, Known Traveler Number, Redress Number) and "Contact Information" (Device Type, Country, Phone Number, Email).

NEED HELP? | COMMENT/COMPLAINT?

DELTA

SHOP | TRAVELING WITH US | SKYMILES® | Search

MY TRIPS | BOOK A TRIP | FLIGHT STATUS | CHECK IN | Jonathan Bell

BOOK A TRIP | BEST FARE GUARANTEE

Start Over | Express Checkout

FLIGHTS | SKY PRIORITY

FRI 02 DEC | DCA → ATL | DL 1333 | 1:50 PM | 3:53 PM | 2h 3m | NONSTOP | Main Cabin (K) | Changeable / Nonrefundable | View Upgrade Eligibility | Complete Delta Air Lines Baggage Information | Price per Passenger: \$406⁵¹ | Taxes, Fees and Charges: \$58⁶⁹

SUN 04 DEC | ATL → DCA | DL 1911 | 09:40 AM | 11:20 AM | 1h 40m | NONSTOP | Main Cabin (U) | Changeable / Nonrefundable | View Upgrade Eligibility | Complete Delta Air Lines Baggage Information

1094 Medallion® Qualification Miles (MQMs) earned | 3663 Miles earned | 407 Medallion Qualification Dollars (MQDs) earned | MILEAGE CALCULATOR

PAY WITH MILES

You've selected a Pay With Miles eligible itinerary. Main Cabin tickets purchased using Pay With Miles may not be eligible for Upgrades. Pay with Miles tickets are eligible for mileage accrual for any portion of the base fare or surcharges paid in currency.

YOUR CURRENT MILES BALANCE: 341,312 | MAXIMUM DISCOUNT PER PASSENGER: \$465.20

Select one

Total Price: \$465²⁰ USD

PASSENGERS

Are You Traveling? YES NO

1

Passenger Information

If the full name below is not an exact match to the name on your government-issued identification, edit your Passenger Info. This Secure Flight Passenger Data is for use by the Transportation Security Administration Only.

PLATINUM MEDALLION

PREFIX: -- | FIRST NAME: JONATHAN | MIDDLE NAME: | LAST NAME: BELL | SUFFIX: --

FREQUENT FLYER PROGRAM: Delta Air Lines / SkyMiles | FREQUENT FLYER NUMBER: | SKYBONUS/BLUEBIZ NUMBER: --

GENDER: Male | DATE OF BIRTH: | KNOWN TRAVELER NUMBER: | REDRESS NUMBER: --

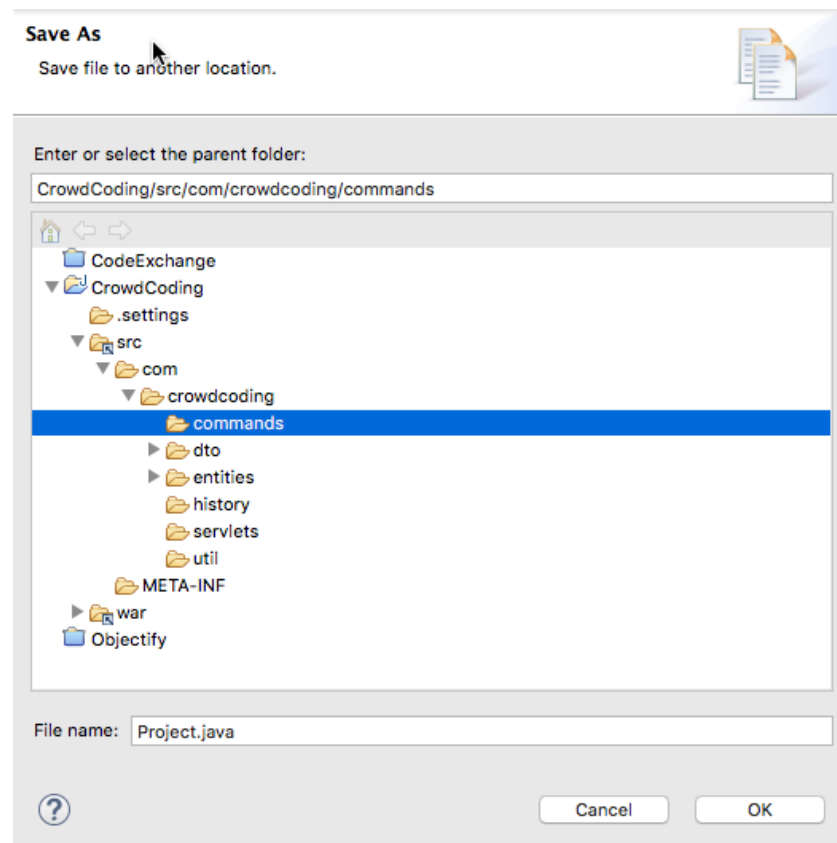
Contact Information

DEVICE TYPE: Cell | COUNTRY: United States (1) | PHONE NUMBER: | EMAIL:

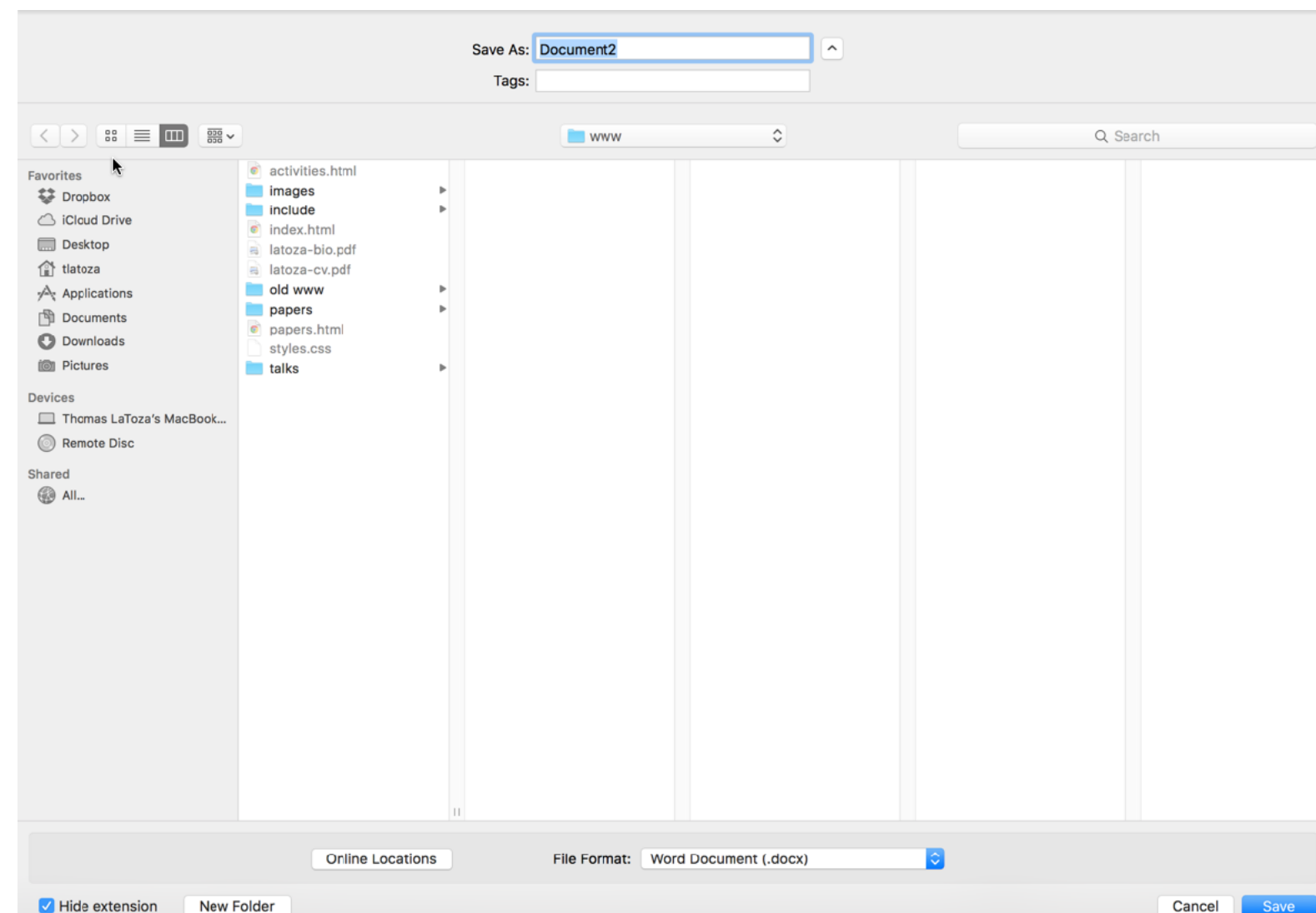
Anticipate likely next actions

- Based on typical observed task flows, surface options for user to take likely next steps

What if folder does not exist?



VS.



Keep users in control

- Important users do not feel constrained
- Want users to feel that they can do things the way they want to do them, not as software dictates to them

The screenshot shows the American Airlines website interface. At the top, there's a navigation bar with the American Airlines logo, links for 'Plan Travel', 'Travel Information', and 'AAdvantage', and a search bar. Below this is a progress bar with steps: 'Find Flights', 'Choose Flights', 'Travelers' (highlighted), 'Trip Options', 'Select Seats', 'Review & Pay', and 'Finish'. The 'Travelers' section is active, showing a flight from Washington to Raleigh/Durham for 1 adult on Sunday January 10, 2016 to Monday January 11, 2016. A 'Show Trip Details' button is below. To the right, the 'Your Trip Price' is \$203.70 USD, with a link for 'Baggage and Optional Charges'. Below this, there's a promotion for AAdvantage members: 'Earn 40,000 bonus miles, up to \$100 in statement credits, and your first checked bag free*!'. To the right of this, the updated price is shown: 'Your Trip Price: \$203.70 USD', 'Statement Credit: - \$100.00 USD', and a final price of '\$103.70 USD'.

American Airlines [Plan Travel](#) [Travel Information](#) [AAdvantage](#) [oneworld](#)

Home Login Hello, THOMAS English Search aa.com

Find Flights Choose Flights **Travelers** Trip Options Select Seats Review & Pay Finish


Travelers

⚠ Check below for errors

✈ Washington to Raleigh/ Durham
1 Adult
Sunday January 10, 2016 – Monday January 11, 2016

[Show Trip Details](#)

Your Trip Price:
\$203.70 USD
[Baggage and Optional Charges](#)

 Earn 40,000 bonus miles,
up to \$100 in statement credits, and your **first checked bag free***!
[Learn More](#)

Your Trip Price: \$203.70 USD
Statement Credit: - \$100.00 USD
\$103.70 USD

Passenger Details

Please enter all passenger names as they appear on the passenger's government-issued photo identification. [More details on passenger names](#)
[TSA Privacy Notice](#)

*Required

Navigation

Navigation usability problems

- User can't find desired location
- User loses track of location
- User can't remember information from another location

Navigation

- Many different contexts where navigation is important
 - Among windows & screens
 - Among panes or frames in a window
 - Among tools and menus
 - Within an information space

Traversing links

- Links - connection between patch offered by the information environment
- Cues - information features associated with outgoing links from patch
 - E.g., text label on a hyperlink
- User must choose which, of all possible links to traverse, has best chance of reaching prey

Web navigation conventions

NEW & INTERESTING FINDS ON AMAZON EXPLORE

amazon Prime LED & LCD TVs lg tv 4k

BLACK FRIDAY DEALS WEEK

Hello, Thomas Your Account Prime Lists Cart

Departments Browsing History Thomas's Amazon.com Today's Deals

Televisions & Video Deals Best Sellers Televisions Streaming Media Players Blu-ray Players Home Theater Systems A/V Accessories

1-24 of 147 results for Electronics : Television & Video : Televisions : LED & LCD TVs : "lg tv 4k" Sort by Relevance

Show results for

- < Any Category
- < Electronics
- < Television & Video
- < Televisions
- LED & LCD TVs

Refine by

Delivery Day

- ☐ Get It by Tomorrow

Amazon Prime

- ☐ Prime

Television Feature

- ☐ Smart TV (132)
- ☐ 3D (53)

Television Resolution

- ☐ 4K Ultra HD (70)
- ☐ 1080p (16)
- ☐ 1080i
- ☐ 760p
- ☐ 760i
- ☐ 720p (1)
- ☐ 720i
- ☐ 480p
- ☐ 480i

Showing most relevant results. See all results for lg tv 4k.

Television Feature: Smart TV | 3D

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Ad feedback

Sponsored

LG Electronics 55UH6550 55-Inch 4K Ultra HD Smart LED TV (2016 Model)

by LG Electronics

\$747.00 \$897.00 Prime

★★★★☆ 25

- Display Size: 55 inches
- Resolution: 4K Ultra HD
- Connectivity Technology: Built-in Wi-Fi
- Display Technology: LED
- Display Resolution Maximum: 4K Ultra HD

Sponsored

LG Electronics 60UH8500 60-Inch 4K Ultra HD Smart LED TV (2016 Model)

by LG Electronics

\$1,297.00 \$1,697.00 Prime

★★★★☆ 87

Electronics Gift Guide

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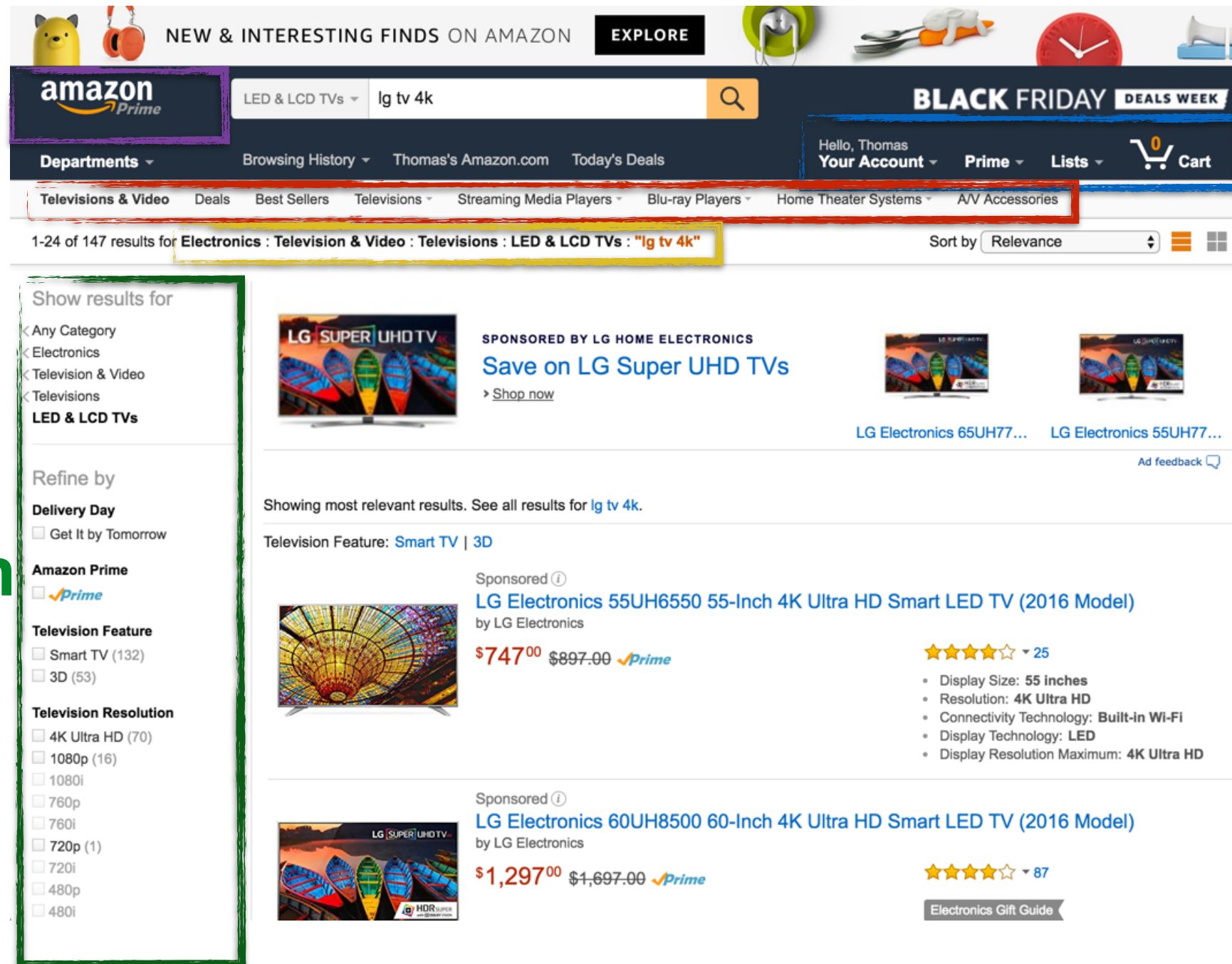
Web navigation conventions

Site ID

You are here

Local navigation

Footer navigation



Utilities
Sections

...

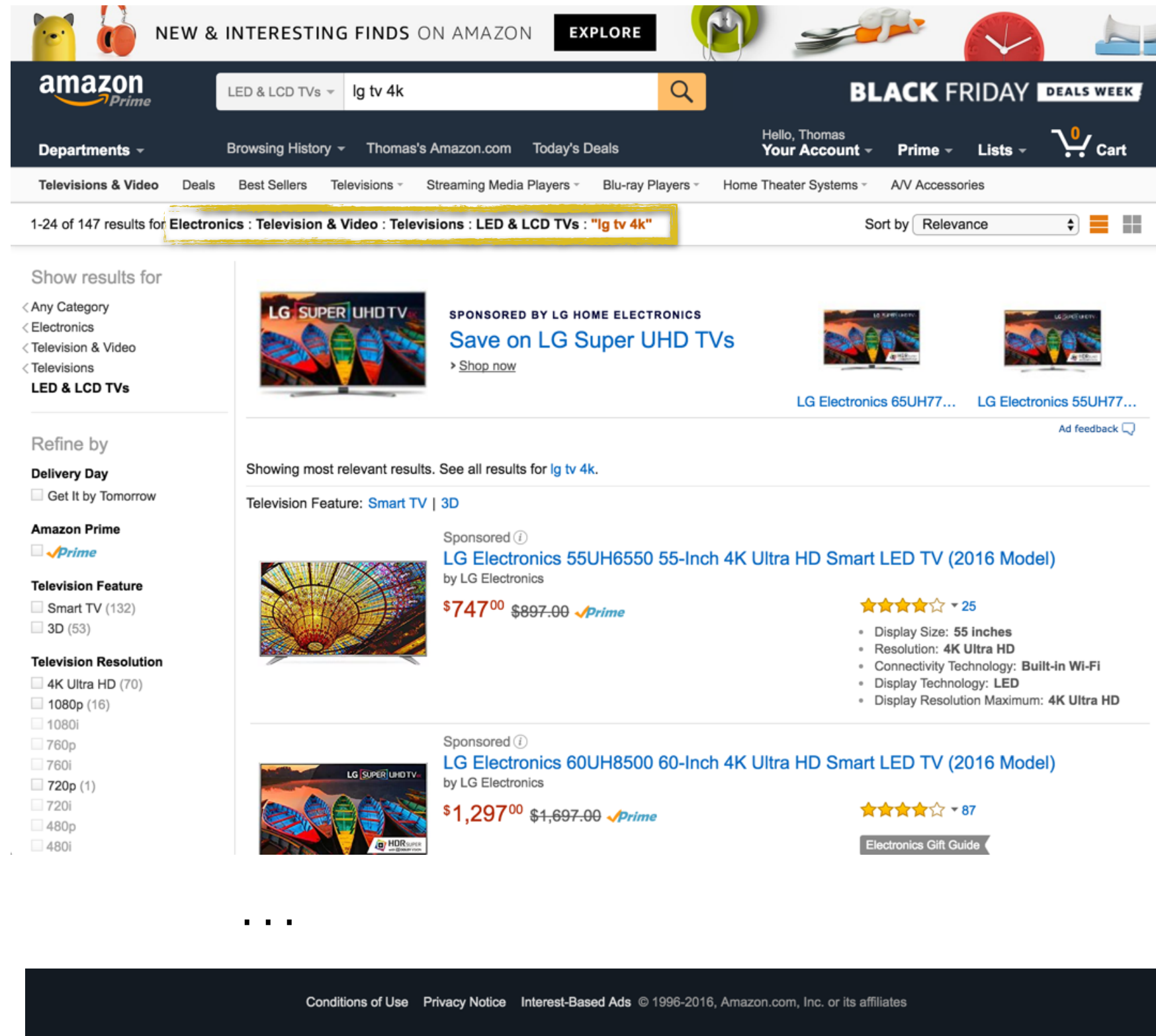
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Persistent navigation

- Forms a common idiom users already understand
- Gives instant confirmation that still on the same site
- Supports consistency and standards
 - If *all* of your pages function same way, users know how to do actions & what to expect
 - Ok for specialized page like forms that are clearly different to not follow conventions.

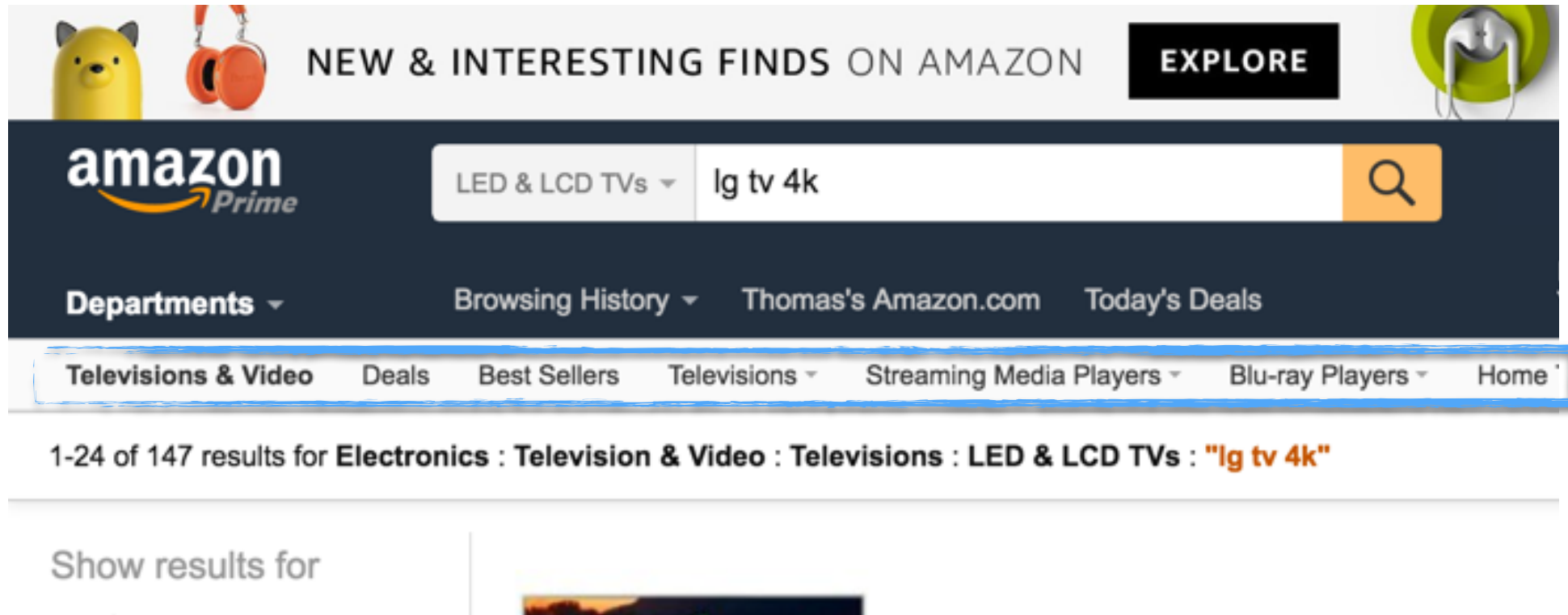
Breadcrumbs

- Offer trail of where the user has been and how they got there
- Shows hierarchy of information space
- Shows current location



...

Tabs



- Example of a metaphor: tab dividers in a three ring binder or folders in a file drawer
- Partition into sections
- Advantages
 - Easily understood and self-evident
 - (Usually) hard to miss

Questions for a good site design

- Answers to the following should be obvious for a good site design
 - What site is this? (Site ID)
 - What page am I on? (Page name)
 - What are the major sections of this site? (Sections)
 - What are my options at this level? (Local navigation)
 - Where am I in the site? (“You are here” indicators)
 - How can I search?