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?

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
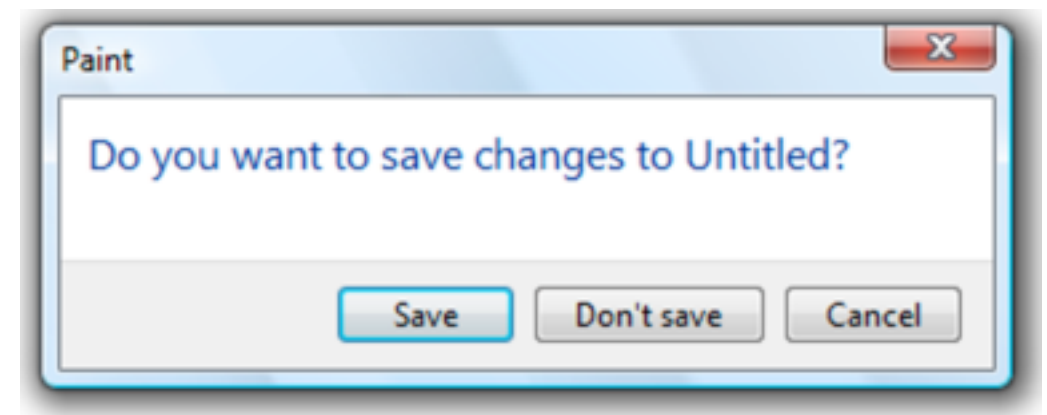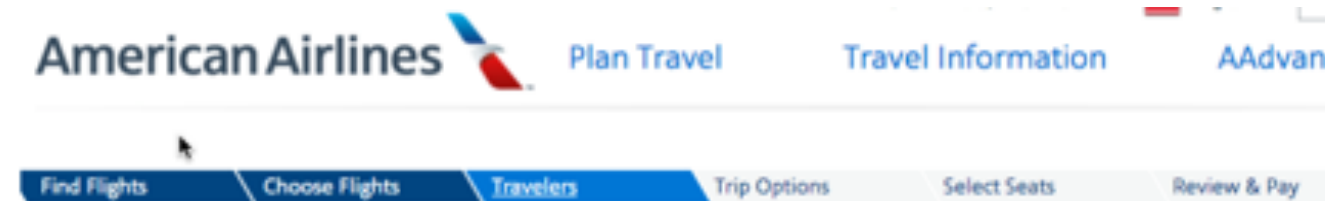
Orchestration & interaction flow

- 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
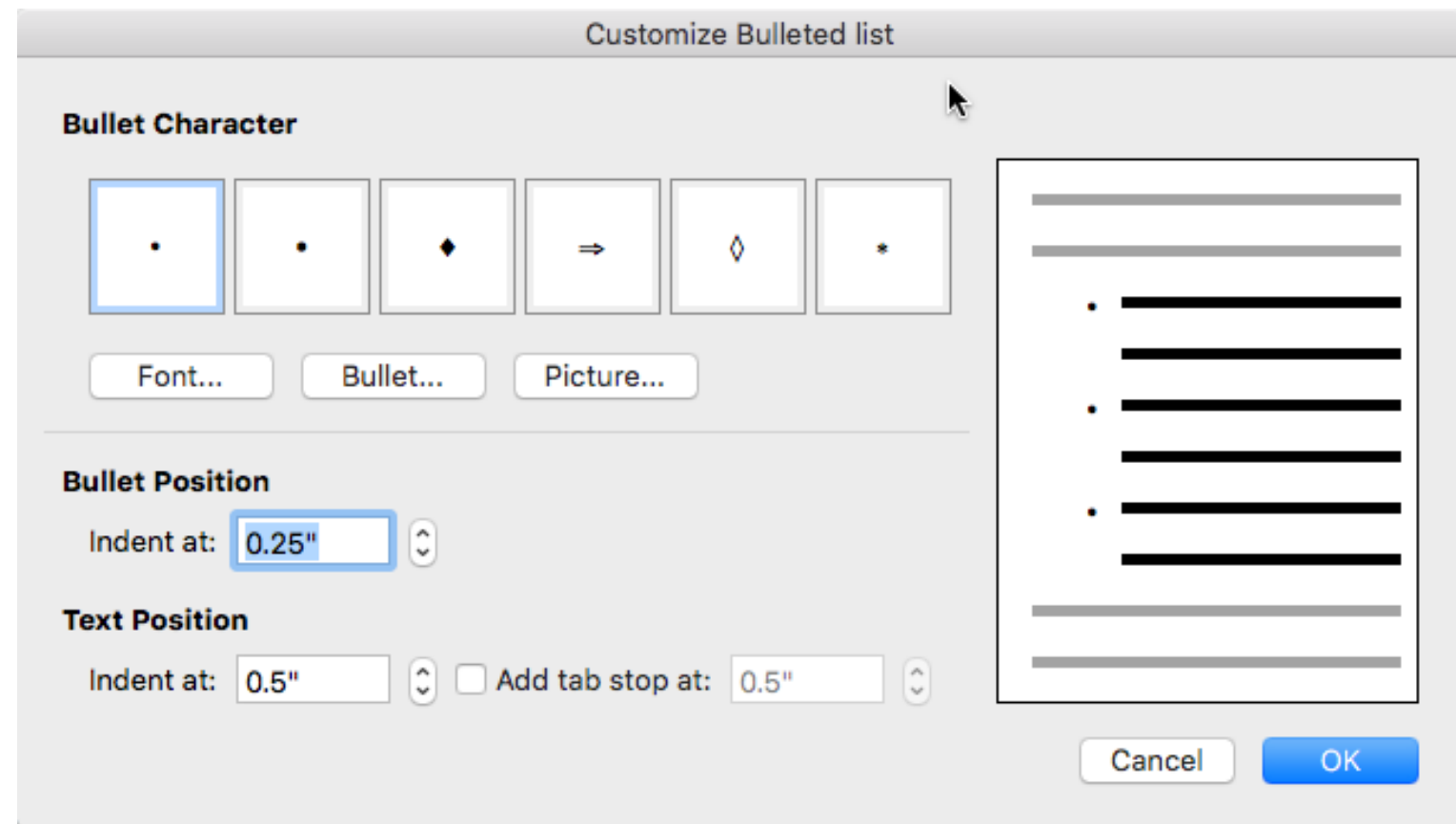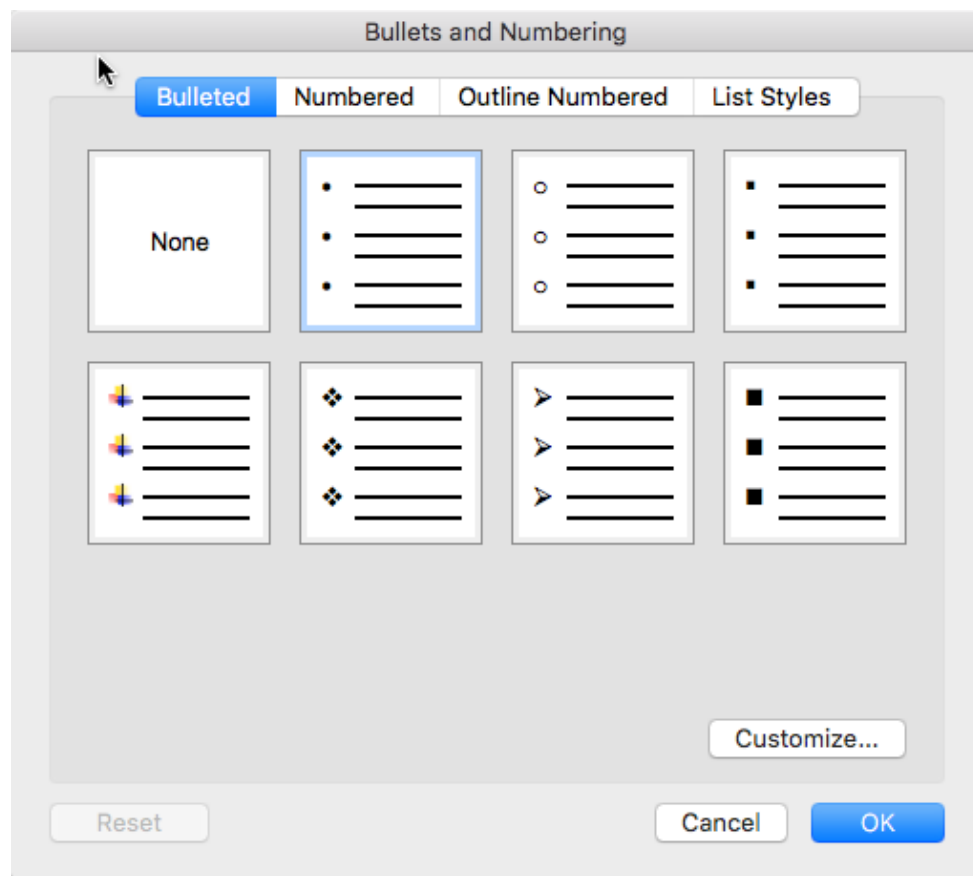
Metaphors & idioms

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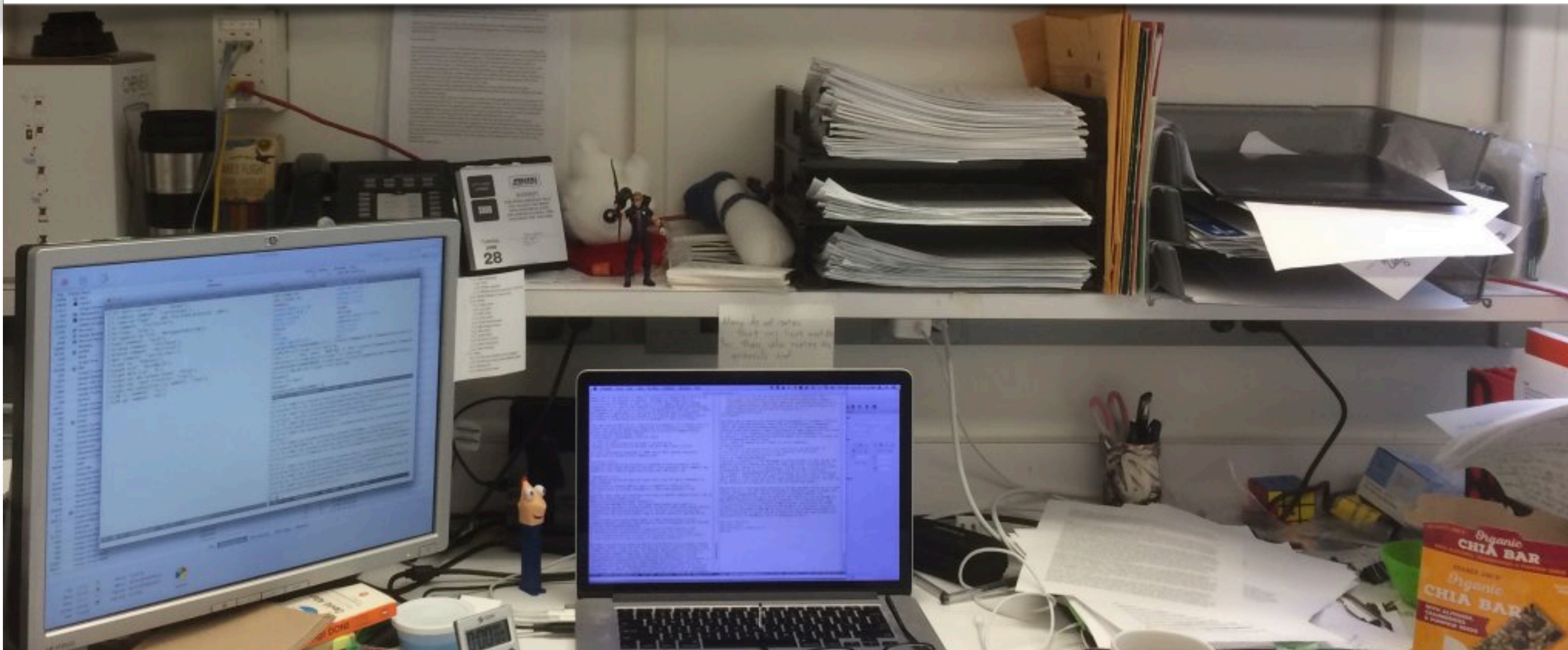
"…Most workers kept information they needed in a specific working area. A common strategy was to create separate piles for each project and place them within the working area, at distances that reflected their urgency."

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
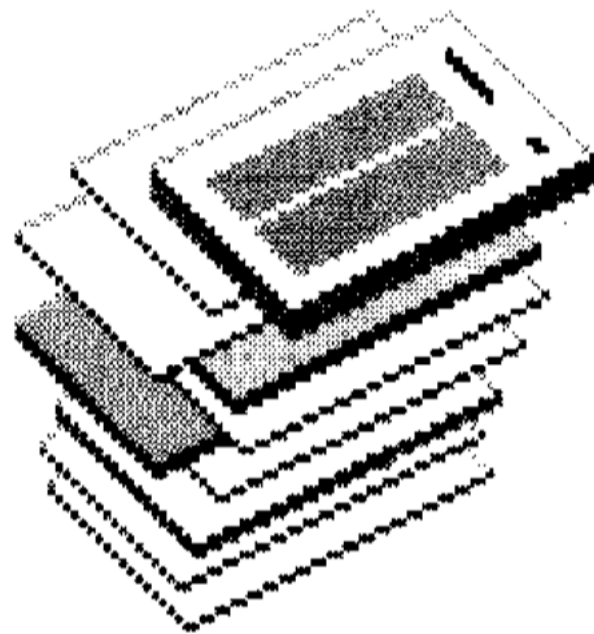
User-created pile (messy)
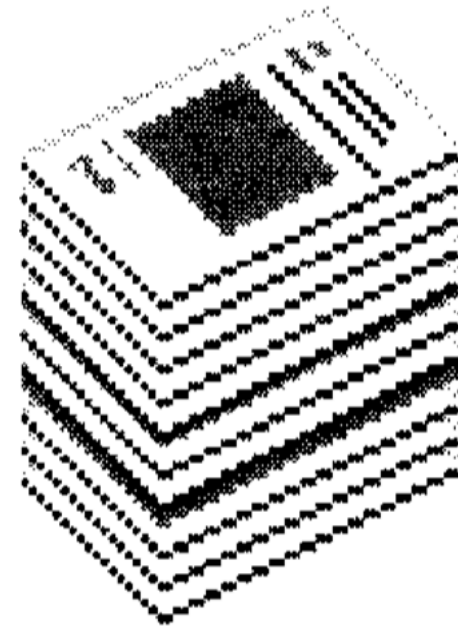
System-created pile (Organized)

Piles - Sketches

- Created sketches to facilitate discussion and evaluation

- Example features:
  - New files added to the pile are directly visually represented
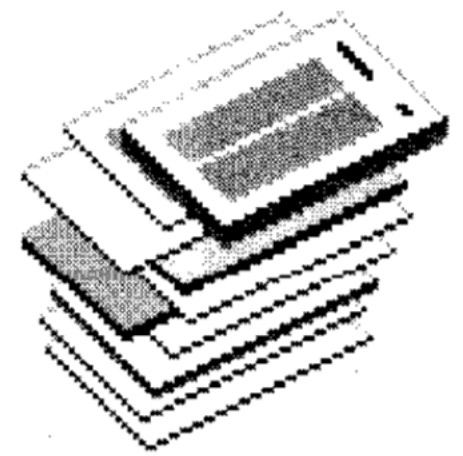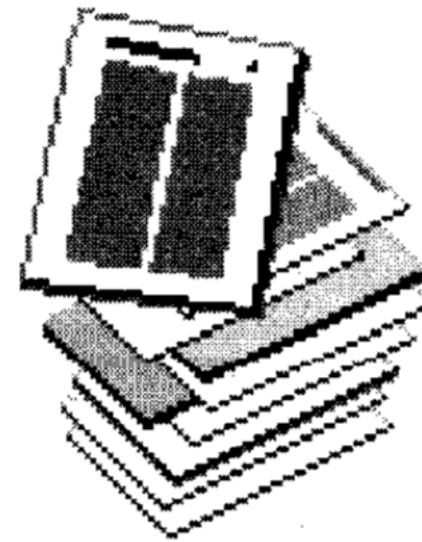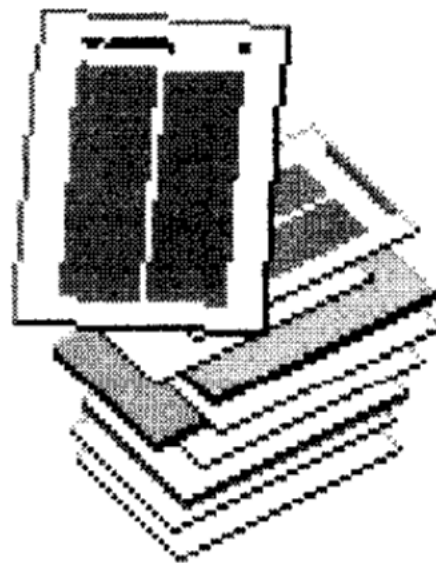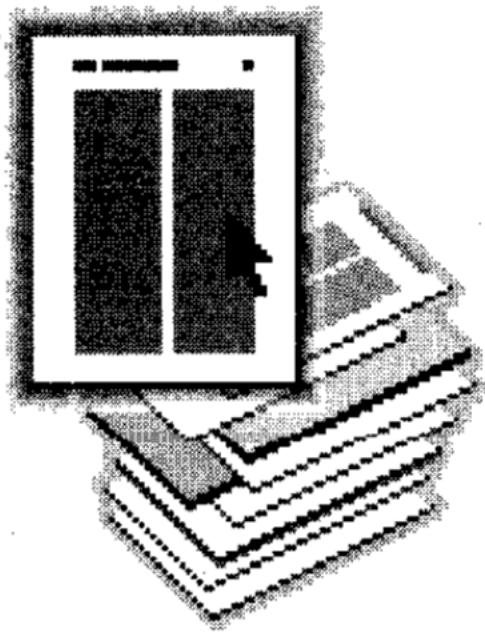
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
  - System-user collaboration for defining rules
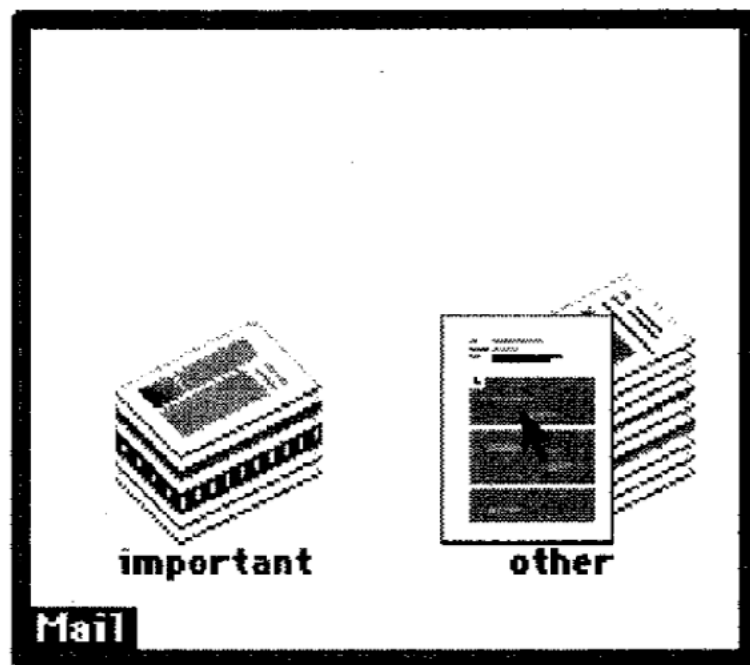
Select an item from
a pile
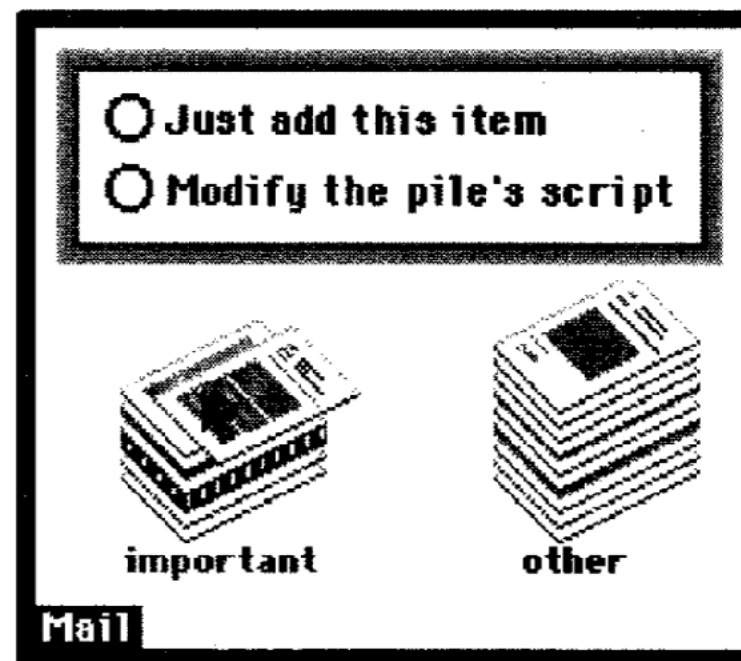
Move to new pile
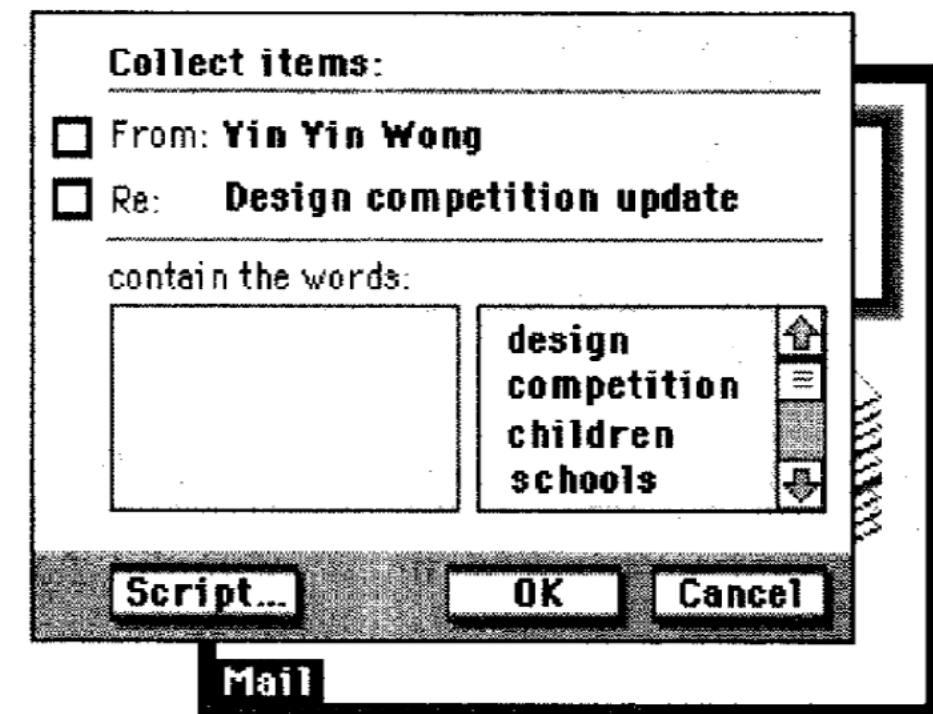
Update pile script

Piles - Sketches

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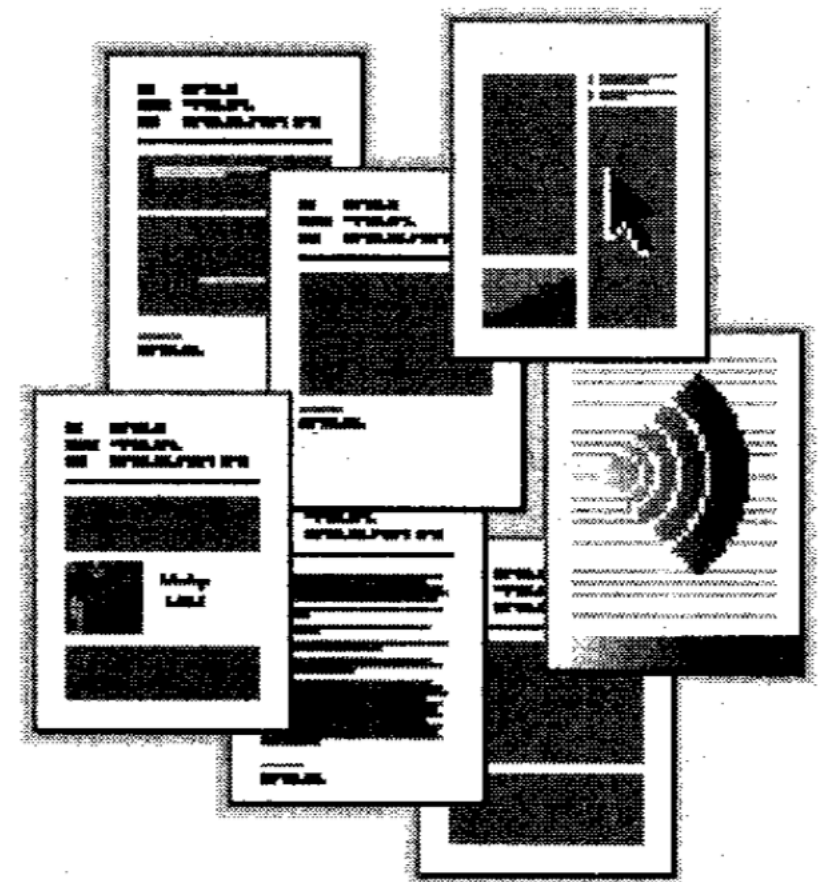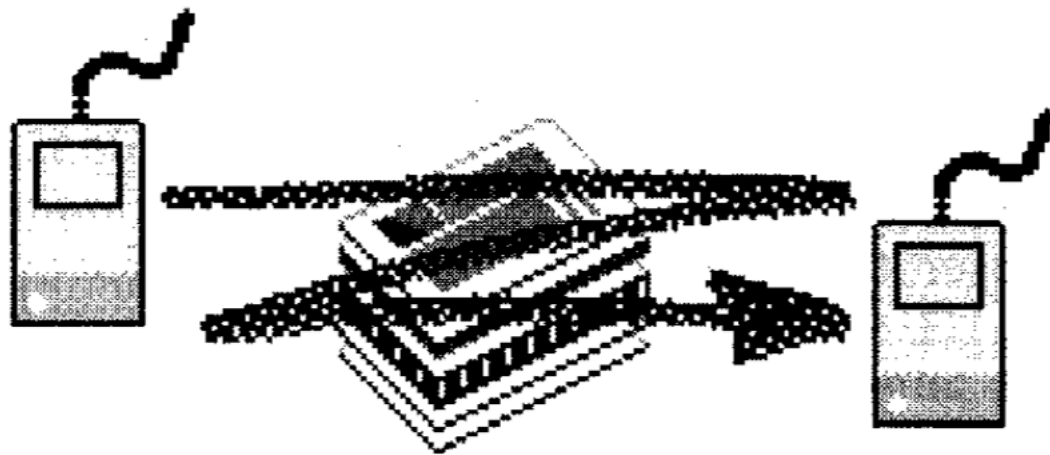
Piles - Sketches

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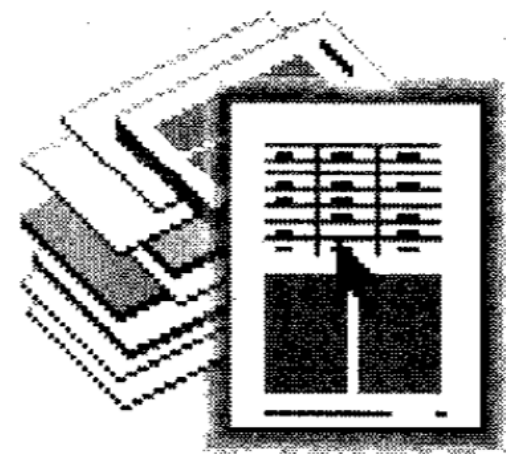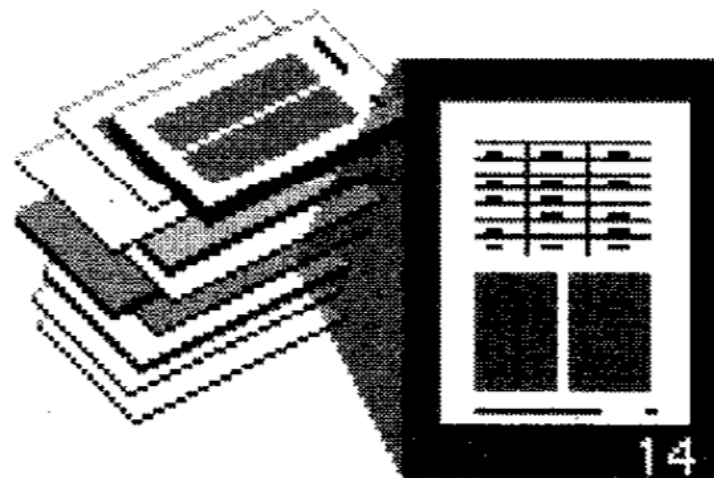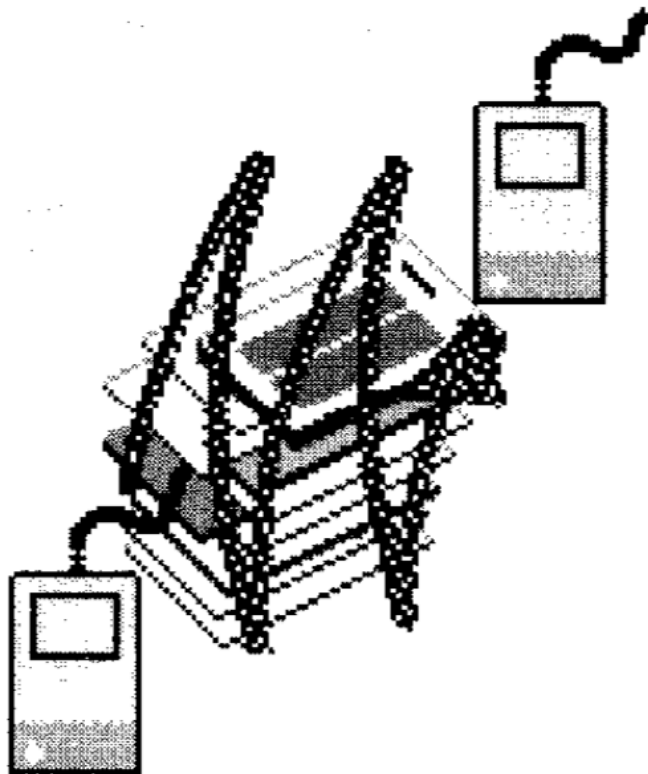
Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
  - Visualizing the contents of a pile
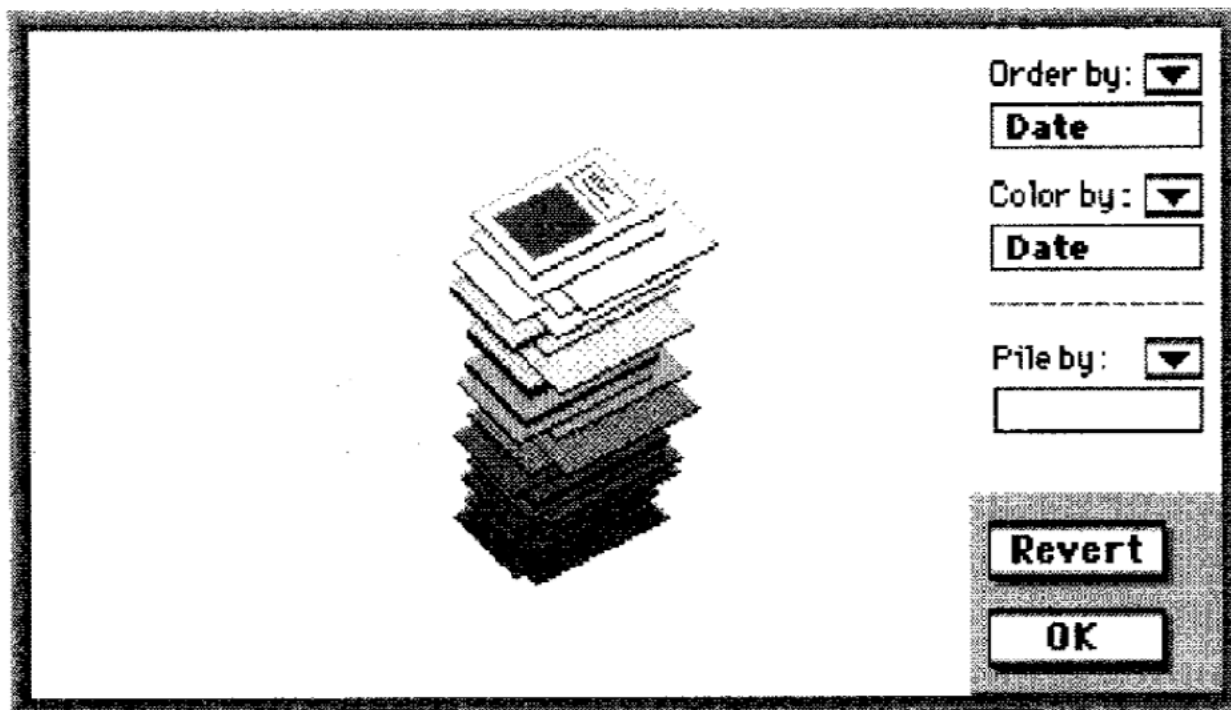
All data, ordered and colored by date
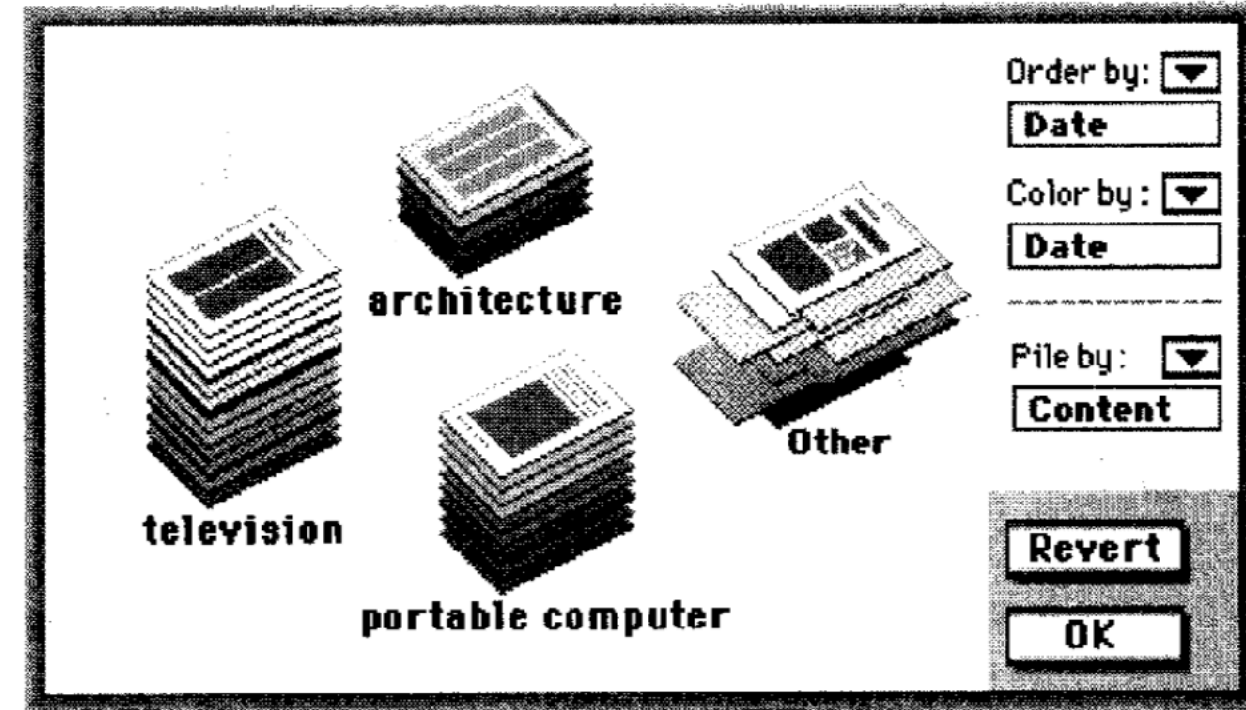
All data, ordered and colored by date, piled by content

Piles - Evaluation

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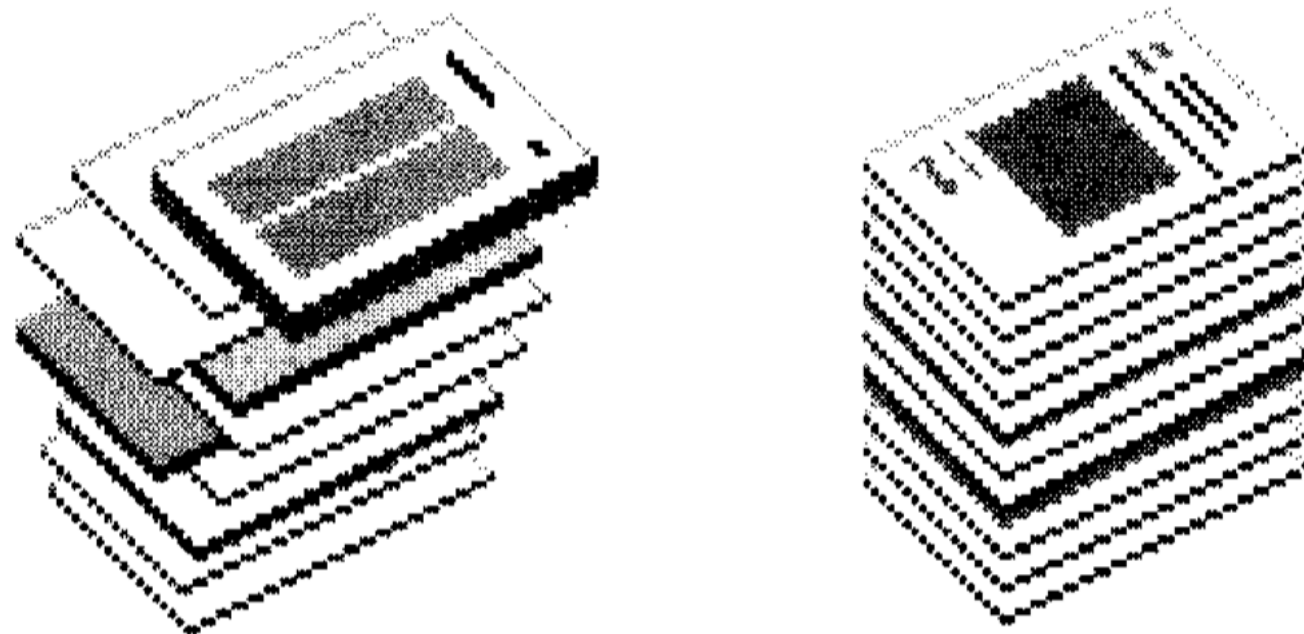
Piles - Legacy

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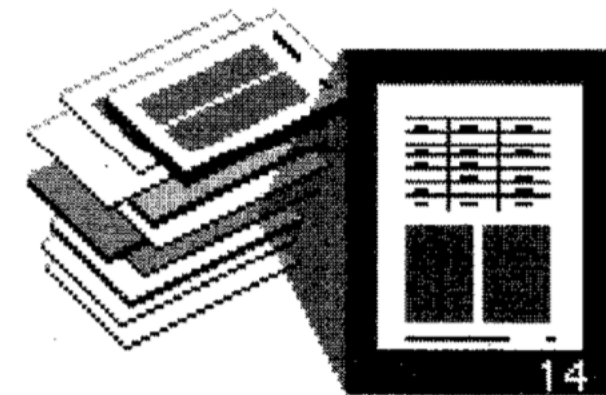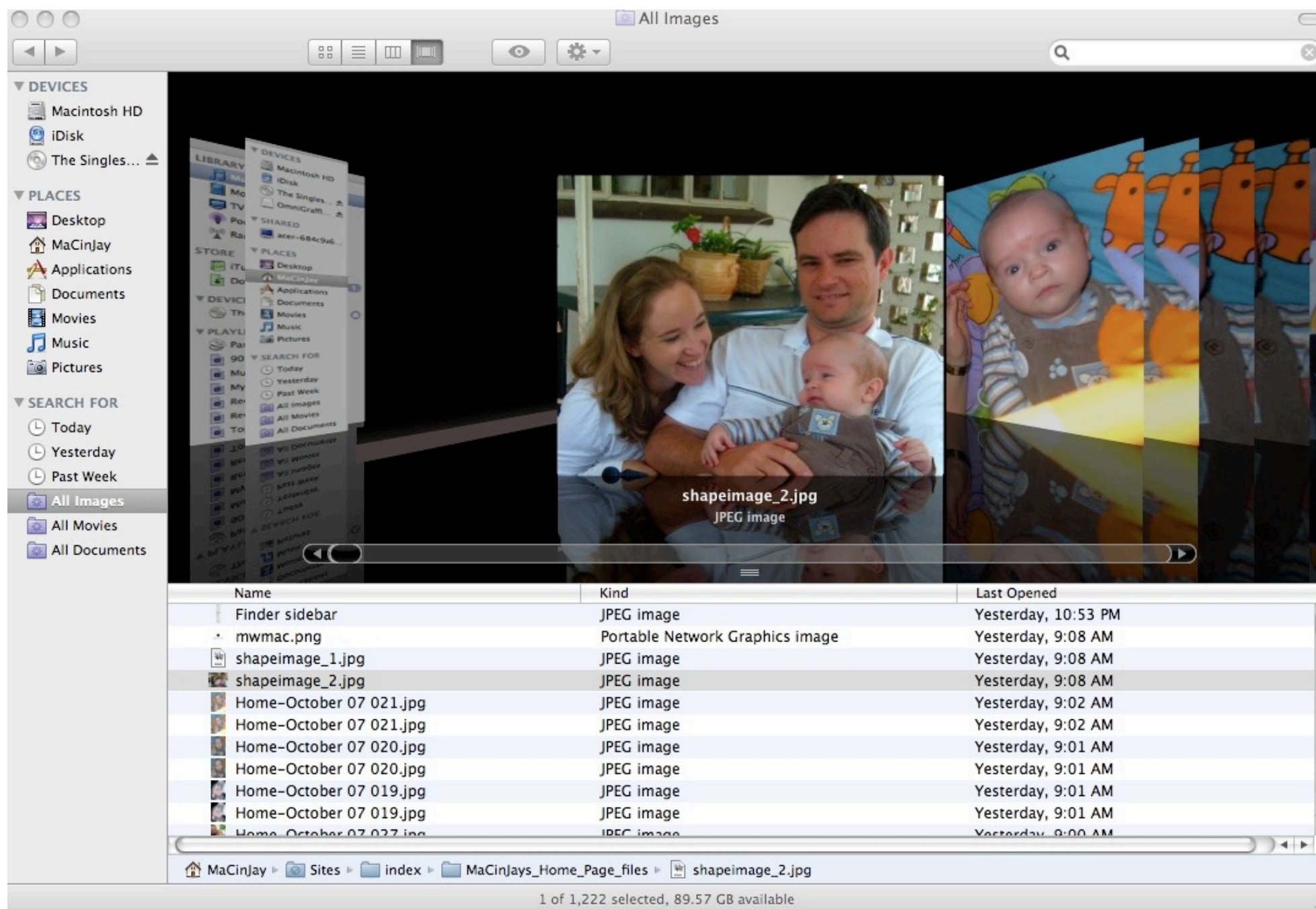
Piles - Legacy

- 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
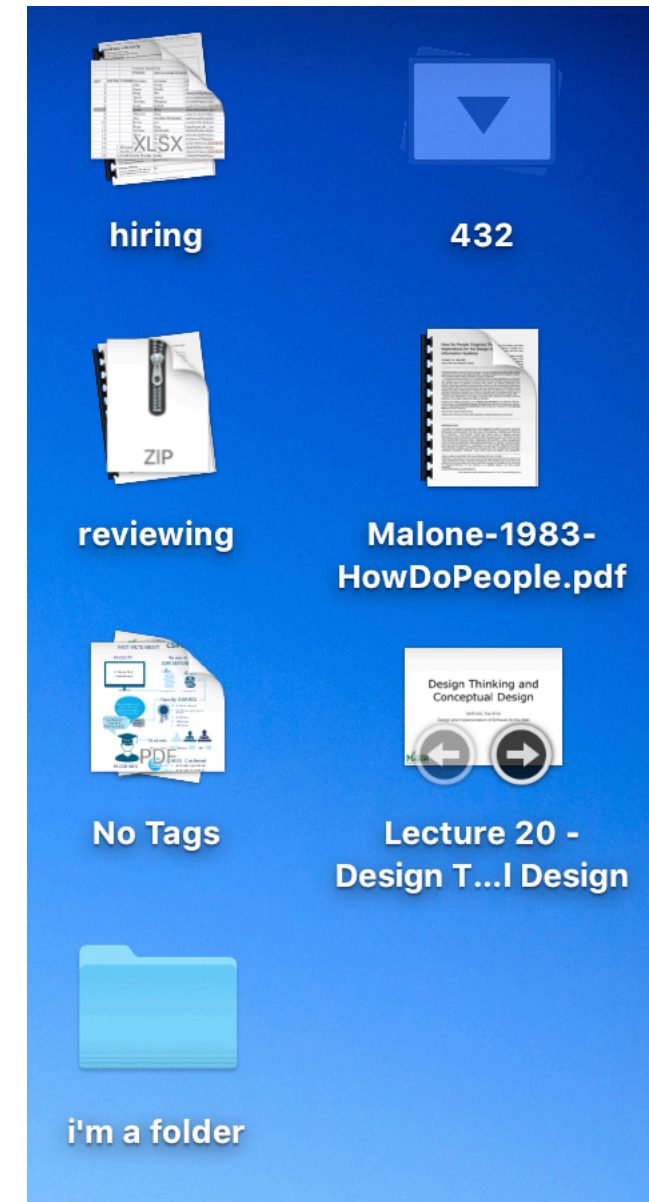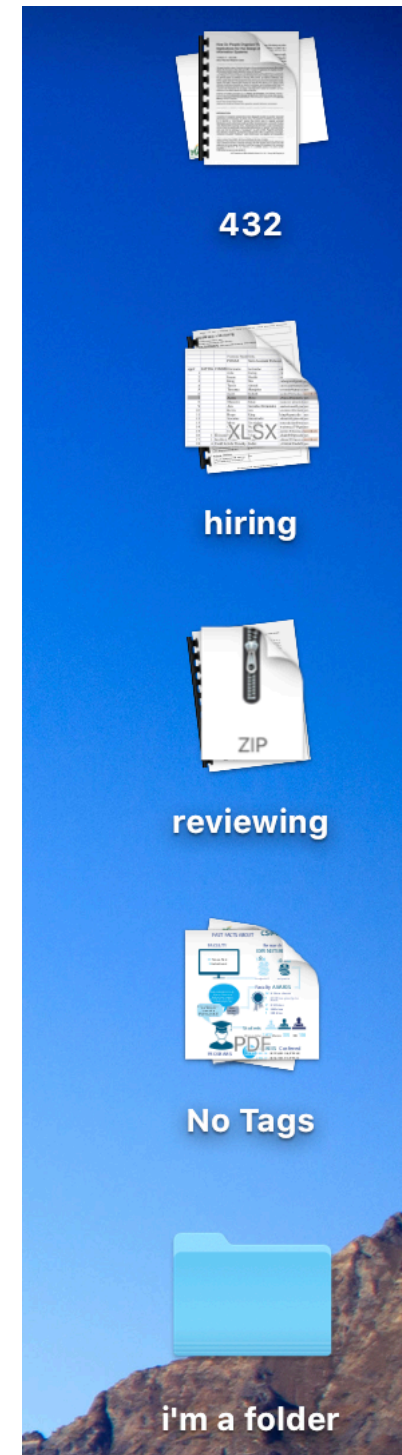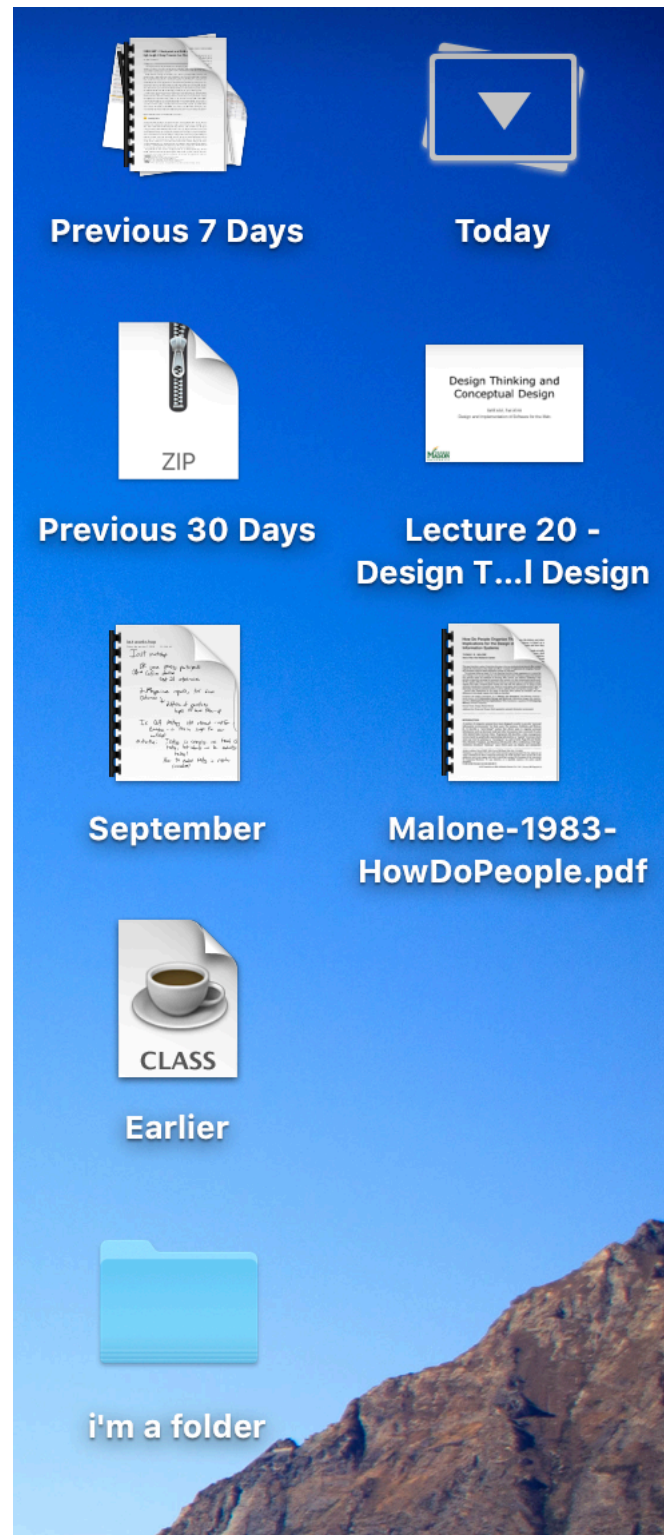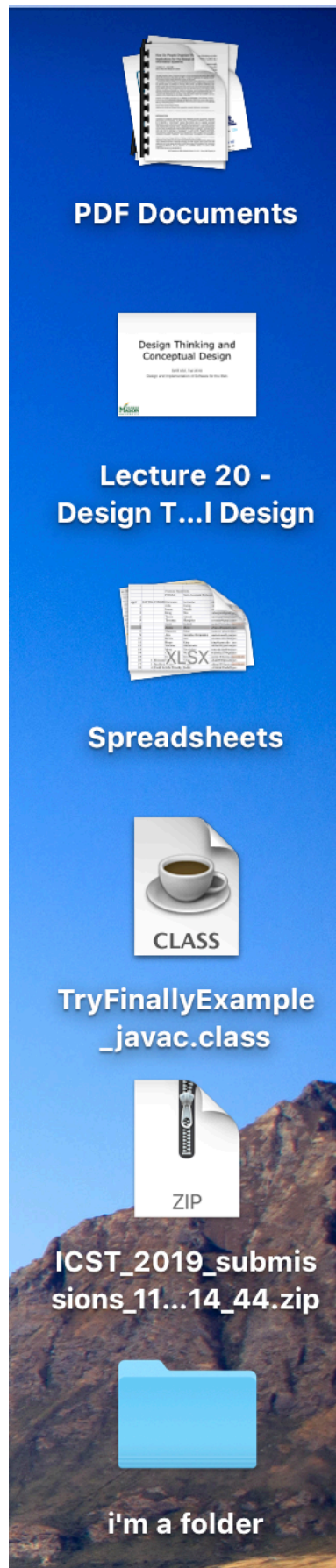
Stack by kind   Stack by last opened   Stack by tag

Open a stack

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

Design for flexibility & efficiency

- Users may take paths never envisioned by designer

- Using studies to identify different task flows, design flexible support for each

Delta: Flight Booking, New User
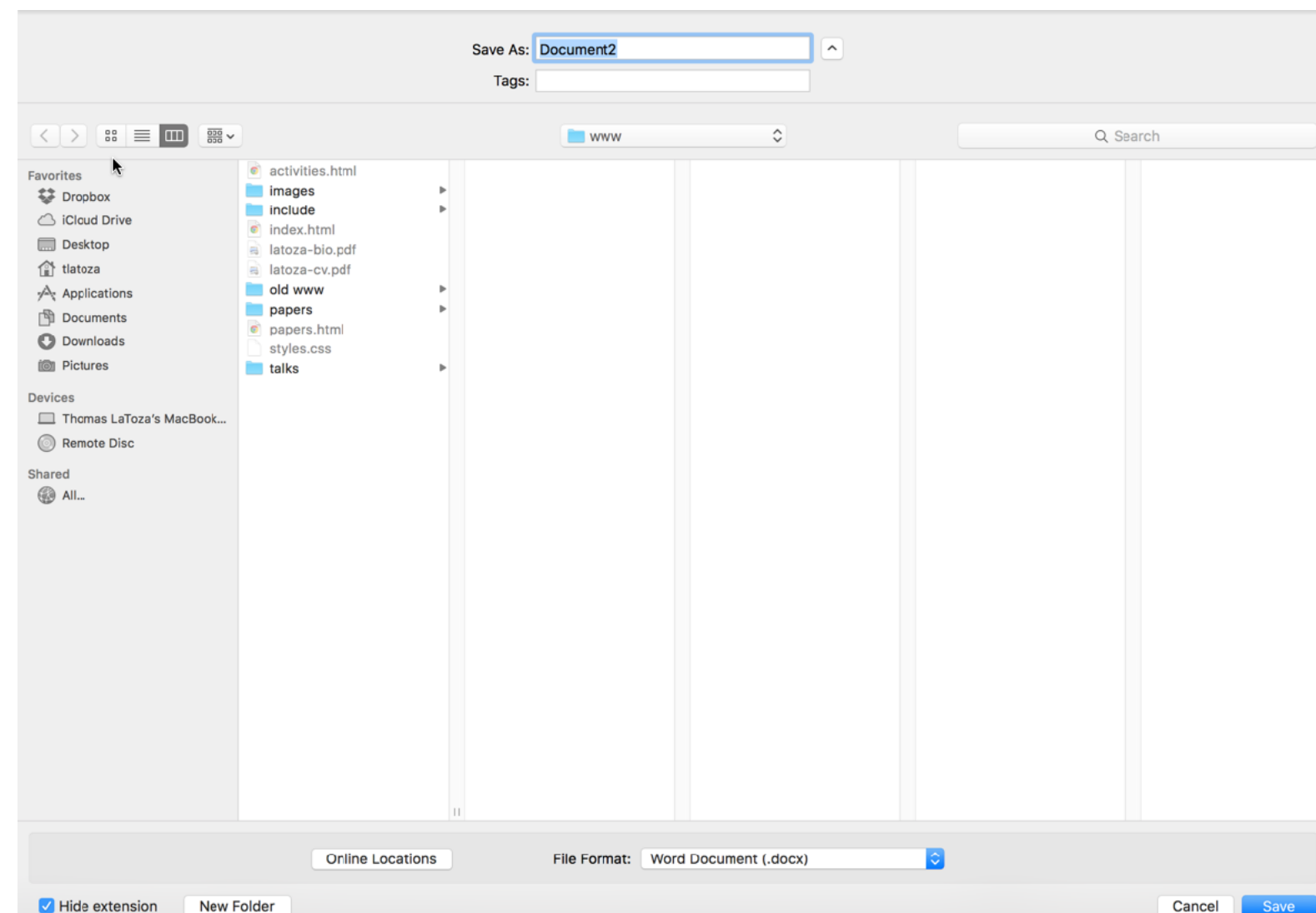
Delta: Flight Booking, Existing User

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?
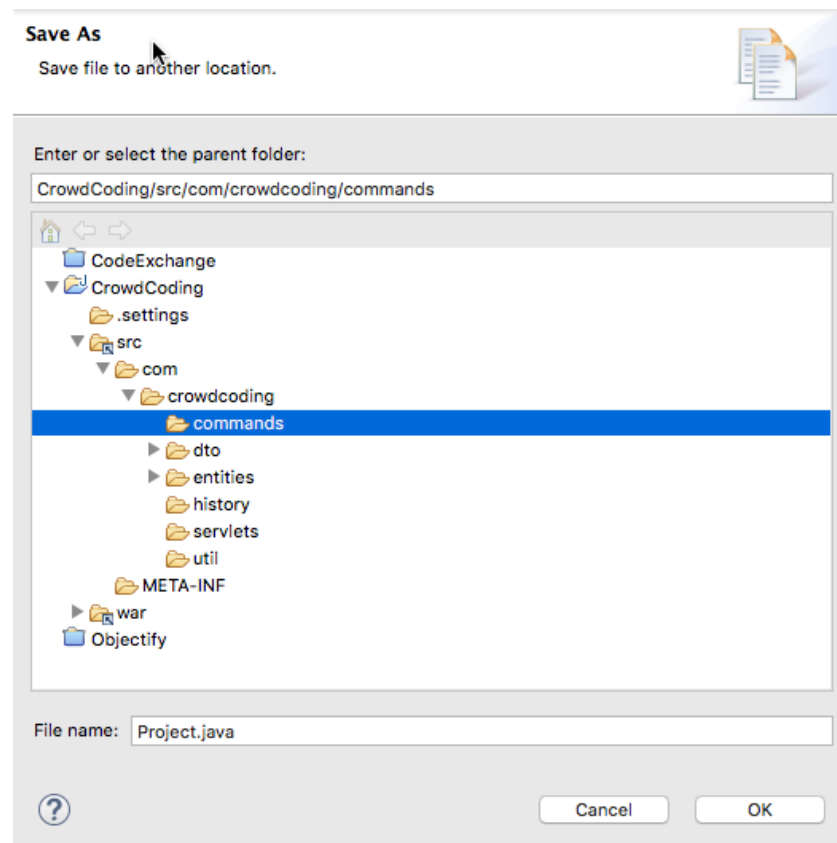
VS.

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

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

Web navigation conventions

Site ID

You are here

Local navigation

Utilities

Sections

Footer navigation
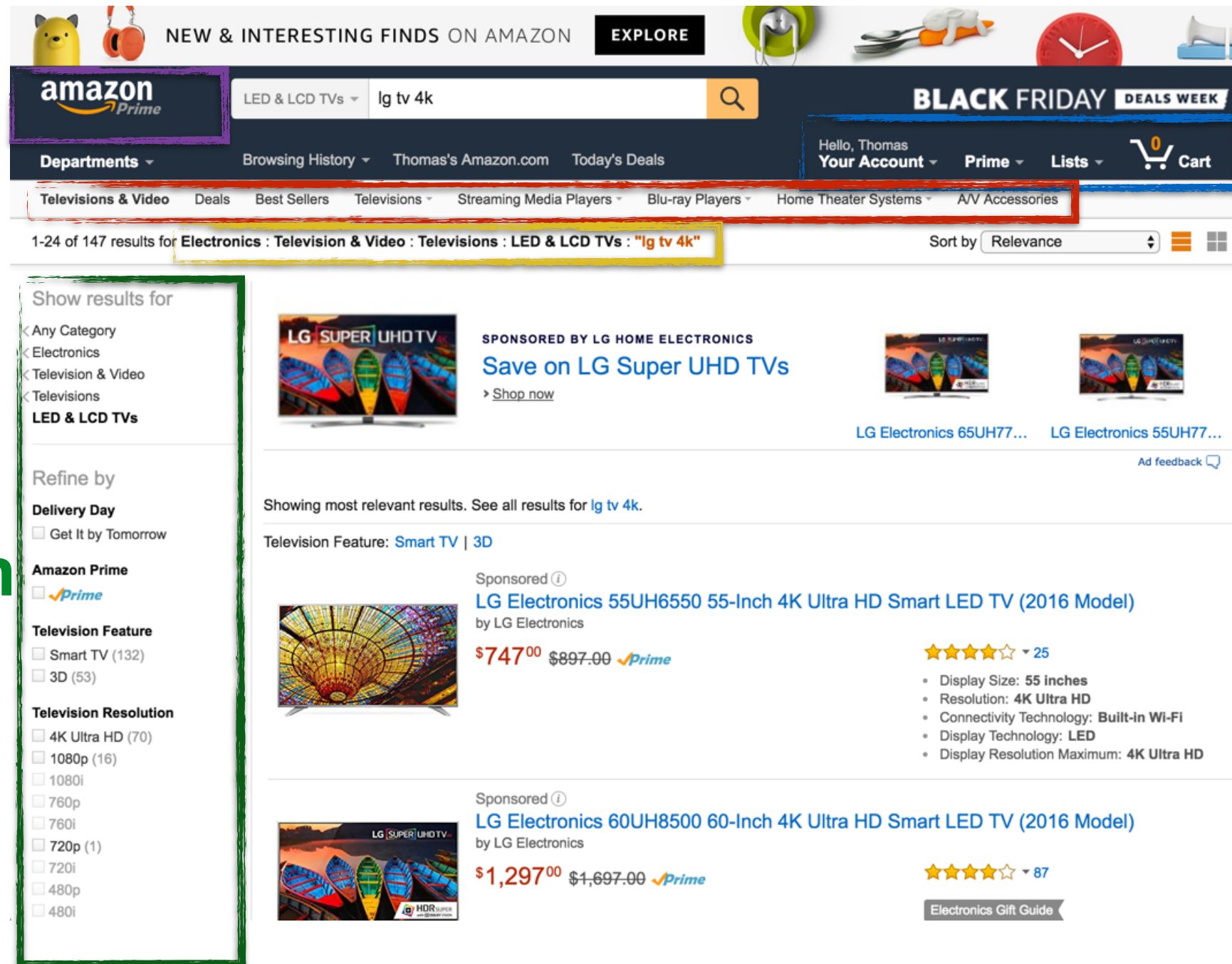
Persistent navigation

- 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
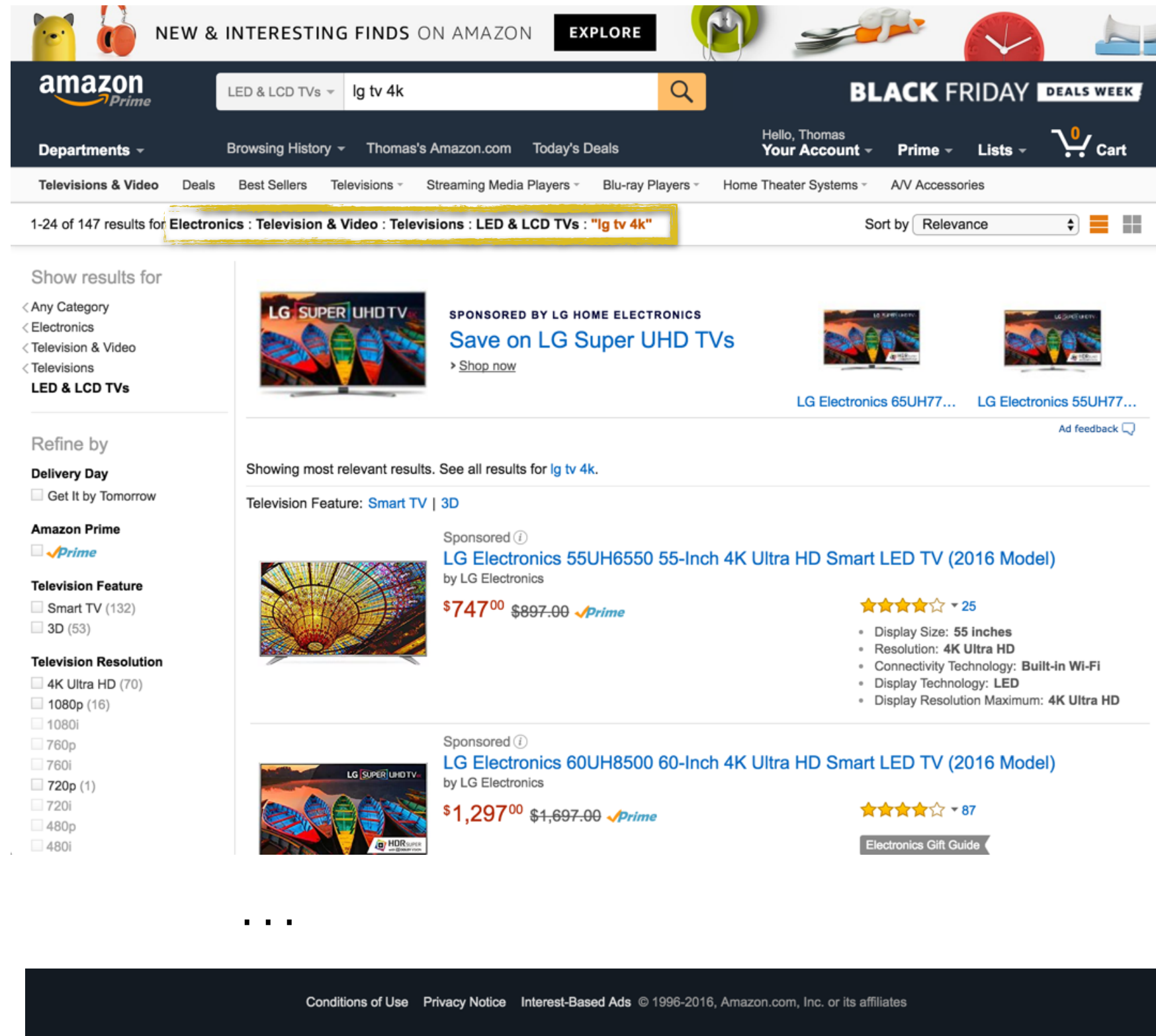
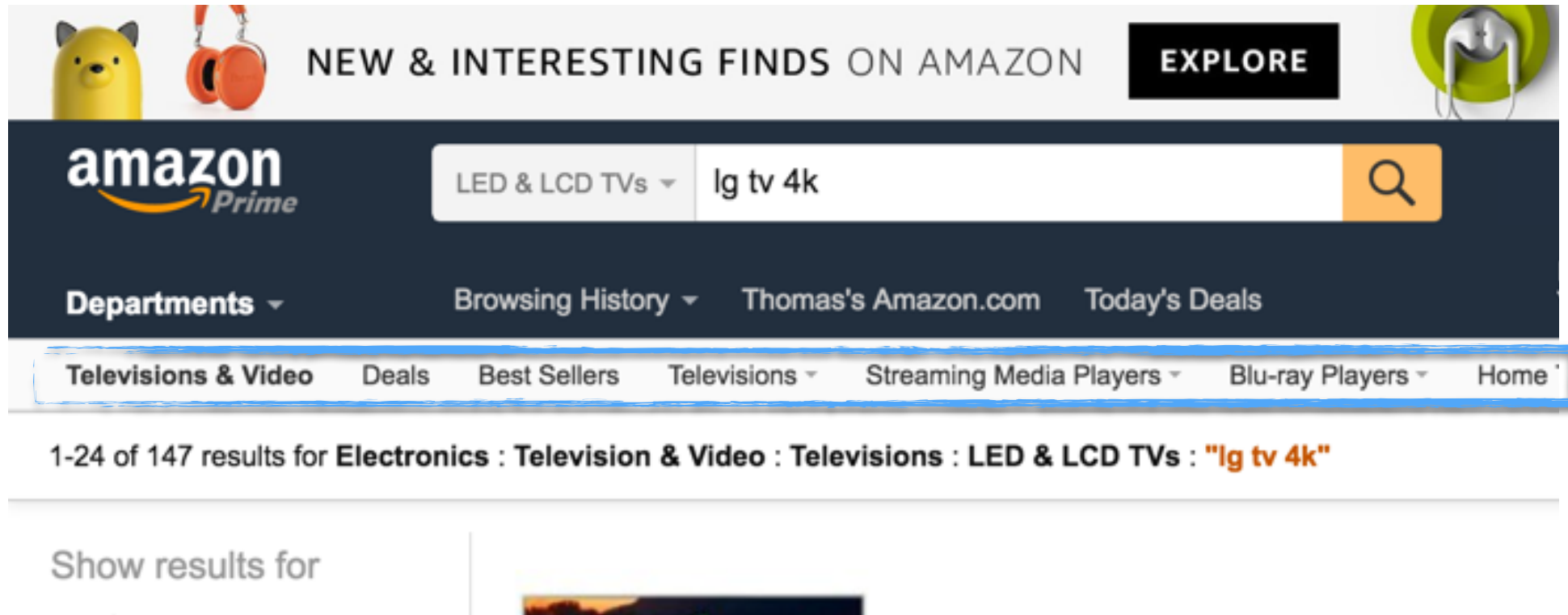# Tabs

- 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?