

SWE 432 -Web Application Development

Fall 2022



George Mason
University

Dr. Kevin Moran

Week 12:

Site Design





Administrivia

- *HW Assignment 3* - Grades and comments posted
- *HW Assignment 4* - Out now, Due November 22nd!
 - Extra Credit Opportunity!
- *HW Assignment 5* - We will discuss today, will be posted this afternoon
- *Note:* Arun will be giving both lectures next week! I will be in Singapore at a conference.



Class Overview

- Today: Site Design
 - Quick Lecture
 - Sketching an Example Site



HW Assignment #5

Overview

In this homework, you will conduct a think-aloud usability study to identify usability issues with existing web application(s) and then prototype the design of a new interface that addresses these issues.

Step 1: Develop user task

In this step, you will select a user task. You should follow the guidelines for choosing and communicating tasks given in the Week 12 Lecture. Your task may focus on a single web application (e.g., PatriotWeb) or may involve multiple applications. You should choose a task that is challenging for users. Write up a description of your task which you will give to participants. You should aim for a task that will take participants 10-15 minutes.



HW Assignment #5

Step 2: Conduct think-aloud usability evaluation

In this step, you will conduct a short think-aloud usability study with two participants. As users work, you should take notes, identifying and describing any critical incidents as they occur. You are free to recruit participants from any source you'd like, including friends, family, and other students in this class.



HW Assignment #5

Step 3: Identify usability issues and potential fixes

Based on the results from your two study sessions, in this step you will consolidate similar critical incidents that occurred (if any) and reflect on the underlying usability issue each embodies. For each critical incident that you identified, first reflect on if it is similar to any other critical incident. After identifying groups, reflect on what is the underlying potential cause? What caused the user to experience this critical incident? What change might help address this issue?



HW Assignment #5

Step 4: Storyboard a new user experience

Based on what you learned, you will now design a new and improved user experience that supports your user task. Your user experience might take the form of a new version of the web app(s) that the user was using or might consist of an entirely new web app. Your goal in building a storyboard is describe how users will use your web app. Your storyboard should consist of key steps, illustrating how a user will act in these steps to accomplish their task. The sketch does not need to be visually detailed: either a hand-drawn sketch or simple drawing program drawn sketch is fine.

As you are building your storyboard, you should design your user experience so that it follows the principles for designing usable interfaces discussed in lecture. In particular, you should identify at least 5 aspects of your user experience design and explain how each of these follows a 1) heuristic evaluation heuristic or 2) principle for building user interfaces described in the Week 11-14 Lectures. You may only use a single heuristic or principle once.

HW Assignment #5

Requirements

- **Step 1: Task design**
 - Follow guidelines given in Lecture 22 to ensure that the 1) goal is specific, 2) a scenario explains the background of what users will be doing, 3) end criterion for task is communicated, and 4) participants have a max time limit.
- **Step 2: Think-aloud usability evaluation**
 - Conduct a think-aloud usability evaluation in which 2 participants work for at least 10 minutes each.
 - Identify critical incidents that occurred.
- **Step 3: Usability issues**
 - Identify at least 3 separate usability issues that participants experienced, describing the symptoms that occurred as well as a possible underlying cause.
- **Step 4: New User experience storyboard**
 - Build a story board describing how users will work in your new web app.
 - Include at least 7 separate steps in the storyboard.
 - Annotate the storyboard with the action that the user or system takes to advance to the next step
 - Describe how the new design follows at least 5 separate heuristic evaluation heuristics or principles given in lecture, clearly identifying the heuristic or principle and briefly describing (in a few sentences) how the design follows the principle.



HW Assignment #5

Overview

In this homework, you will conduct a think-aloud usability study to identify usability issues with existing web application(s) and then prototype the design of a new interface that addresses these issues.

Usability Studies



Iterative Model of User-Centered Design

Observation

(Re)Define the Problem
Understand User Needs

Idea Generation

Brainstorm
what to build



Test

Evaluate what
you have built

Prototype

Build

Iterative Model of User-Centered Design

Observation

(Re)Define the Problem
Understand User Needs

Test

Evaluate what
you have built



Idea Generation

Brainstorm
what to build

Prototype

Build

Quiz #9



Go to:

<https://bit.ly/3UoWmj7>

Reminder: Quiz 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.

SWE 432 - Web Application Development



George Mason
University

Instructor:
Dr. Kevin Moran

Class will start in:

09:00

Quiz 9



Go to:

<https://bit.ly/3UoWmj7>

Overview of Site Design Principles





Exercise: How Should a Shopping App be Organized?

- Items organized into categories
- Shopping cart for collecting items you want to buy
- Secure way to enter payment information
- An easy way to search for items

Today



- What's a design space?
- 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 balance tradeoffs between competing objectives in site design?



Design Space

- Space of **alternatives** that might potentially exist
 - All potential aspects of design (dimensions) that might vary
 - All potential choices for each design dimension
- Choosing a point in this space requires choosing design goals
 - Thus far: task performance
 - Achieving this can often be decomposed into smaller design goals
 - e.g., minimize user errors, support more efficient navigation
 - And sometimes other design goals
 - Help users relax
 - Confuse users to teach them something
 - Encourage contributions to community
- Can use user-centered design to explore design space
 - Identify needs, sketch / prototype solution, evaluate
 - But large, so hard to enumerate every value for every variable




Interaction Techniques

- Way in which user interacts with user interface
- Examples
 - Search
 - Tabs
 - Progressive disclosure
 - Direct manipulation
- Represents a specific solution for a specific problem
 - May or may not be the best solution for a specific set of user needs and design goals
 - But helps reduce size and complexity of search space by offering standard choices



What can you do with this app?

Google Cloud Platform console showing the Task Queues page. The page displays a table with columns for Queue Name, Tasks In Queue, Completed In Last Min., Oldest Task ETA, Maximum Rate, Enforced Rate, Bucket Size, and Maximum Concurrent. Two queues are listed: 'default' and 'subscription-queue'. The 'subscription-queue' has a red warning icon next to its name.

Queue Name	Tasks In Queue	Completed In Last Min.	Oldest Task ETA	Maximum Rate	Enforced Rate	Bucket Size	Maximum Concurrent
default	0	0		1/s		1	
 subscription-queue	0	0		0/s		5	



Analogy: Buying a Chainsaw

- You walk in to a hardware store to buy a chainsaw. What do you do?



Challenges in Site Design

- Sometimes large space for users to navigate to find information.
- 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.
- No place to check if something is *not* present or supported.



Site Design

- Some key design dimensions
 - Organization of content into pages / screens
 - Organization of content within pages / screens
 - Ways in which users navigate between pages / screens
- Key design goals
 - Reduce the time / cost for users to reach content
 - Reduce the irrelevant information users must read



Planning

- Help users determine what they **can** do
 - Is this the right site for my goals? Is this the right page where I should spend my time?
- Support users in how they **determine** what to do
 - If this is the right place, how do I reach goal?

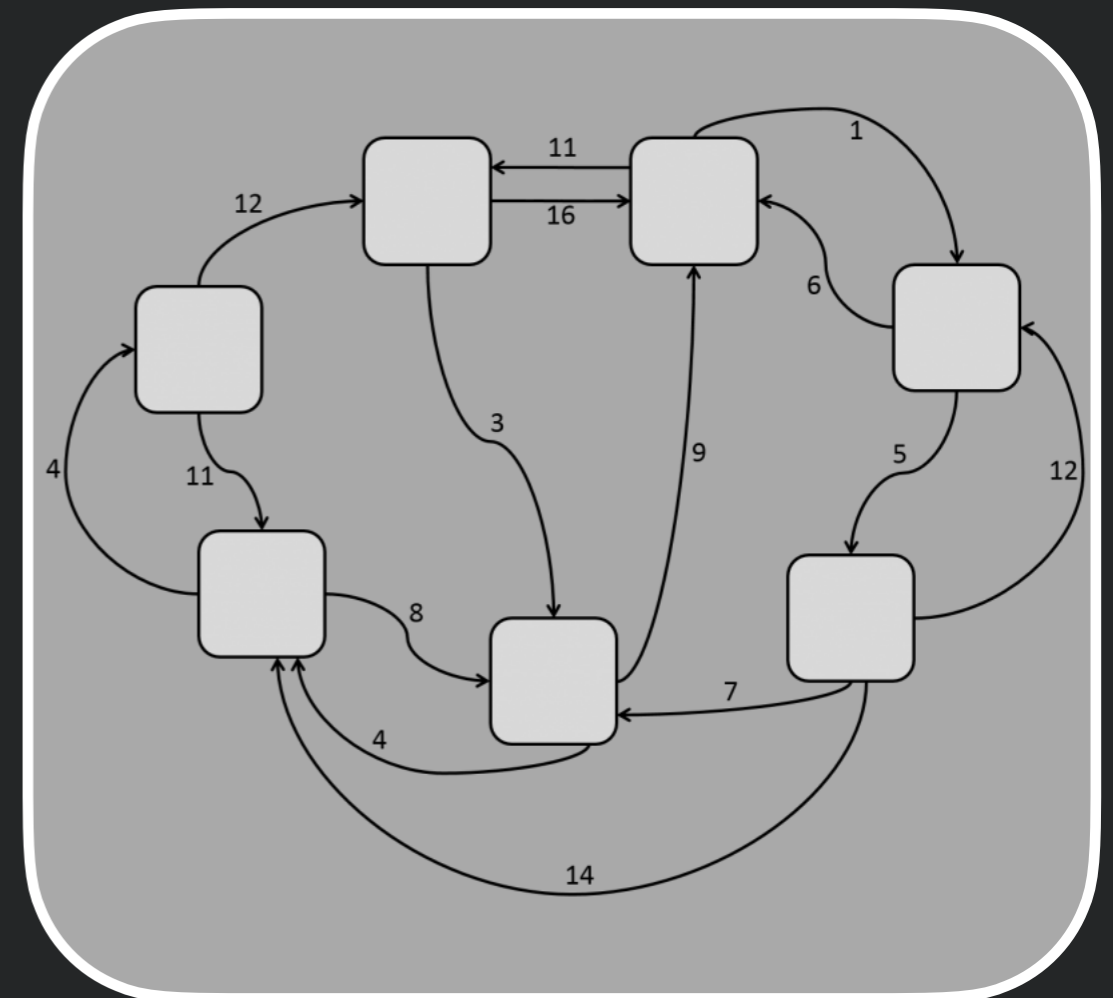


Information Foraging

- Mathematical model describing navigation
- Analogy: animals foraging for food
 - Can forage in different patches (locations)
 - Goal is to maximize chances of finding **prey** while minimizing time spent in hunt
- Information foraging: navigating through an information space (patches) in order to maximize chances of finding prey (information) in minimal time

Information environment

- Information environment represented as topology
 - Information patches connected by traversable links
- Examples
 - Web pages, connected by links
 - Menu options & dialogs connected by commands
 - Locations on map, connected by search, scroll, move interactions with map





Traversing Links

- Patch - a space in the environment where a user is located (e.g., a page, a dialog)
- 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

- User interprets cues on links by likelihood they will reach prey
- e.g., do I think that the “Advanced options” page is likely to have the option I’m looking for?





Simplified mathematical model

- Users make choices to maximize possibility of reaching prey per cost of interaction
- Predators (idealized) choice = $\max [V / C]$
 - V - value of information gain, C - cost of interaction
- Don't usually know ground truth, have to estimate
- Predator's desired choice = $\max [E[V] / E[C]]$



Design Implications of Information Foraging Theory

- Organize information into functionally **related** groups
 - If information required is already on same page, no need to go elsewhere
- Design effective **cues**, helping users predict what will be found by traversing links
 - Better cues --> better ability to navigate to correct pages
- Match **expectations** of user's mental model
 - Cues are interpreted relative to mental model
- Provide **search**
 - In large spaces, faster to search than traverse links



Search Increases Competition

- Users often enter sites through search engines, looking for site that will help accomplish goals
- Users form first impressions of sites rapidly
- Users will try another site if they perceive the value of continuing to forage in patch is low

Navigation





Common Navigation Usability Problems

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

Hierarchy

- Information in sites is hierarchical
 - Different pages at different levels of hierarchy
 - May be different navigation elements that lead into different subtrees
- Important to signal
 - what hierarchies are present
 - which navigation elements are part of the same hierarchy
 - where the user currently is on each hierarchy

Example: Wikipedia



The screenshot shows the Wikipedia homepage with the following elements:

- Header:** "Not logged in" with links for "Talk", "Contributions", "Create account", and "Log in". A search bar is present with the text "Search Wikipedia".
- Navigation:** "Main Page" and "Talk" tabs. "Read", "View source", and "View history" links are also visible.
- Welcome Message:** "Welcome to Wikipedia, the free encyclopedia that anyone can edit. 5,594,019 articles in English".
- Featured Article:** "From today's featured article" section featuring **Barry Voight**, an American geologist, volcanologist, author, and engineer. It includes a detailed biography and a list of "Recently featured" articles: *Resident Evil: Apocalypse*, *Elcor*, *Minnesota*, and *Freedom Planet*.
- Did you know...:** A section with several trivia items, including a mention of **Major Shaitan Singh** (with a small image of his statue) and **Charles Phillips**.
- In the news:** A section with news items such as "Vladimir Putin (pictured) is re-elected President of Russia" and "Brazilian politician and human rights activist Marielle Franco is killed in a shooting in Rio de Janeiro". It includes a small image of Vladimir Putin.
- On this day...:** A section for historical events, including "March 20: March equinox (16:15 UTC, 2018); Independence Day in Tunisia (1956)" and "235 – Maximinus Thrax succeeded to the throne of the Roman Empire". It includes a small image of Harriet Beecher Stowe.
- Today's featured picture:** A section with a large image of the **Acacus Mountains** in western Libya, with a descriptive text below it.
- Left Sidebar:** Contains the Wikipedia logo, "The Free Encyclopedia", and various navigation links like "Main page", "Contents", "Featured content", "Random article", "Donate to Wikipedia", "Wikipedia store", "Interaction", "Help", "About Wikipedia", "Community portal", "Recent changes", "Contact page", "Tools", "What links here", "Related changes", "Upload file", "Special pages", "Permanent link", "Page information", "Wikidata item", "Print/export", "Create a book", "Download as PDF", "Printable version", "In other projects", "Wikimedia Commons", "MediaWiki", "Meta-Wiki", "Wikispecies", "Wikibooks", "Wikidata", "Wikinews", "Wikiquote", "Wikisource", "Wikiversity", "Wikivoyage", "Wiktionary", and "Languages".



Web navigation conventions

The screenshot shows the Amazon website interface. At the top, there's a navigation bar with the Amazon Prime logo, a search bar containing 'LED & LCD TVs' and 'lg tv 4k', and a 'BLACK FRIDAY DEALS WEEK' banner. Below the search bar, there are links for 'Departments', 'Browsing History', 'Thomas's Amazon.com', and 'Today's Deals'. On the right, there's a user account section with 'Hello, Thomas', 'Your Account', 'Prime', 'Lists', and a 'Cart' icon.

The main content area shows search results for 'LED & LCD TVs : "lg tv 4k"'. There are 1-24 of 147 results. The results are sorted by 'Relevance'. A sidebar on the left allows users to 'Show results for' and 'Refine by' various categories and features.

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

Search Results:

- SPONSORED BY LG HOME ELECTRONICS**
Save on LG Super UHD TVs
> Shop now
LG Electronics 65UH77... LG Electronics 55UH77...
Ad feedback
- Showing most relevant results. See all results for [lg tv 4k](#).
- Television Feature: [Smart TV](#) | [3D](#)
- Sponsored ⓘ
LG Electronics 55UH6550 55-Inch 4K Ultra HD Smart LED TV (2016 Model)
by LG Electronics
\$747⁰⁰ ~~\$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
\$1,297⁰⁰ ~~\$1,697.00~~ Prime
★★★★☆ 87
Electronics Gift Guide



Web navigation conventions

Site ID

You are here

Local navigation

Utilities
Sections

The screenshot shows the Amazon website interface. At the top, there's a navigation bar with the Amazon Prime logo, a search bar containing 'LED & LCD TVs' and 'lg tv 4k', and a 'BLACK FRIDAY DEALS WEEK' banner. Below the search bar, there are navigation links for 'Departments', 'Browsing History', 'Thomas's Amazon.com', and 'Today's Deals'. A secondary navigation bar lists categories like 'Televisions & Video', 'Deals', 'Best Sellers', etc. The main content area shows search results for 'lg tv 4k', including a sponsored advertisement for LG Super UHD TVs and two product listings: 'LG Electronics 55UH6550 55-Inch 4K Ultra HD Smart LED TV (2016 Model)' and 'LG Electronics 60UH8500 60-Inch 4K Ultra HD Smart LED TV (2016 Model)'. A sidebar on the left provides filters for 'Show results for', 'Refine by', 'Delivery Day', 'Amazon Prime', 'Television Feature', and 'Television Resolution'. The footer contains a 'Conditions of Use', 'Privacy Notice', and 'Interest-Based Ads' link.

Footer
navigation

MS in Computer Science

Masters Students

- Advising
- FAQs
- Foundation Courses
- MS in Computer Science
 - Core Courses
 - Pre-approved Courses
 - CS Course Descriptions
 - Accelerated BS/MS Programs
- MS in Information Systems
- MS in Information Security and Assurance
- MS in Software Engineering
- Graduate Certificates

The MS in Computer Science prepares students for research and professional practice in computer science and related technologies. The program includes both fundamentals and advanced work in the areas of artificial intelligence and databases, programming languages and software engineering, systems and networks, theoretical computer science, and visual computing.

Degree Requirements

Students are required to complete 30 credits corresponding to 10 graduate courses. Courses are divided into **basic courses**, which have no graduate course prerequisite, and **advanced courses**, which have a graduate course as a prerequisite.

Courses are grouped in the following five broad areas:

- Artificial Intelligence and Databases
- Programming Languages and Software Engineering
- Systems and Networks
- Theoretical Computer Science
- Visual Computing

All the following requirements should be satisfied for the MS in CS degree:

- CS 583 - Analysis of Algorithms (from the Theoretical Computer Science area) and two additional core courses from two other areas must be successfully completed with a grade of B- or better.
- At least four courses (12 credits) must be chosen from the **advanced courses** in the list of preapproved courses from at least three different areas.
- At least six courses, including two advanced courses, must be designated CS.
- At least eight courses must be taken from the list of preapproved courses. Up to two computer science-related courses that are not on the list of preapproved courses may be taken with the approval of the Computer Science Department.

Project/Thesis (optional):

Three to six credit hours of the advanced classes may be replaced by a project or thesis. The project or thesis must be guided and approved by a committee of three appropriate faculty members and presented at an appropriate forum. The thesis must meet relevant university requirements.

For additional information on the degree requirements of the MS in CS:

- The MS CS section of the Mason Catalog is the **official source** for the degree requirements of the program.
- These slides from the orientation for new MS students provide an overview of the program, as well as additional useful information.

Academic Advising

A plan of study form for the MS degree should be completed and submitted by the student soon after admission to the program. This serves as a planning guide for the student. This plan should be kept up to date by regular consultation with the academic advisor. A final signed version of the plan must be included when the student submits a graduation application.

Plan of Study forms for all the MS degrees offered by the CS department are available at this web page.

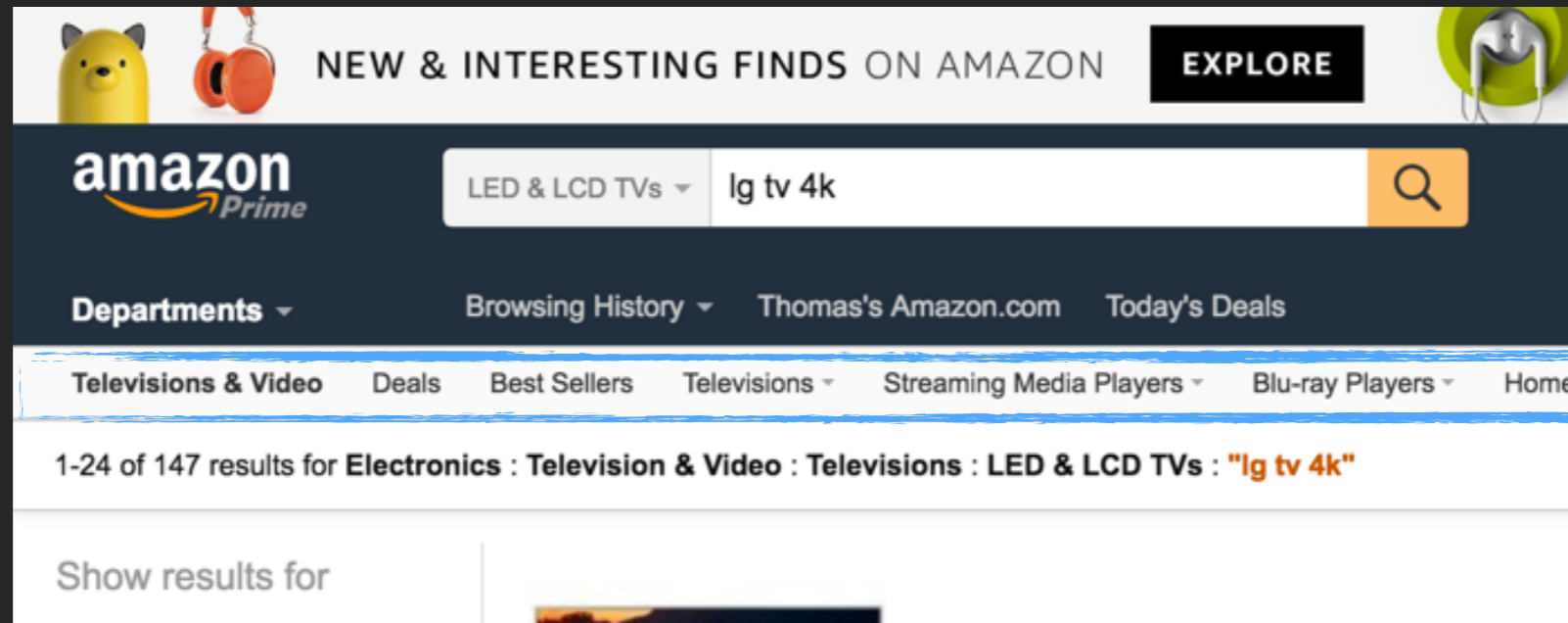
For more information, please see the academic advising pages and the FAQ for Masters students.



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.

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

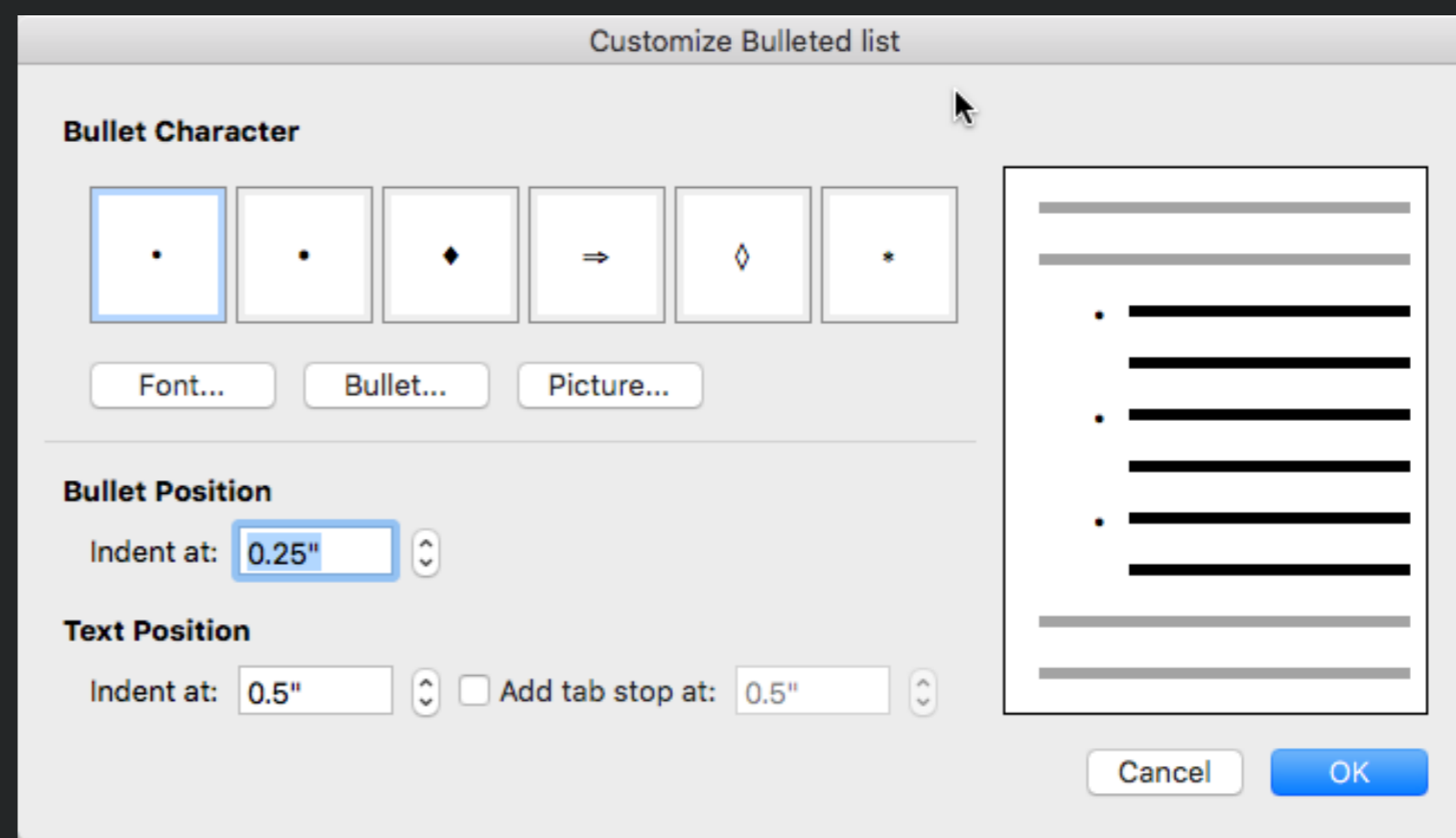
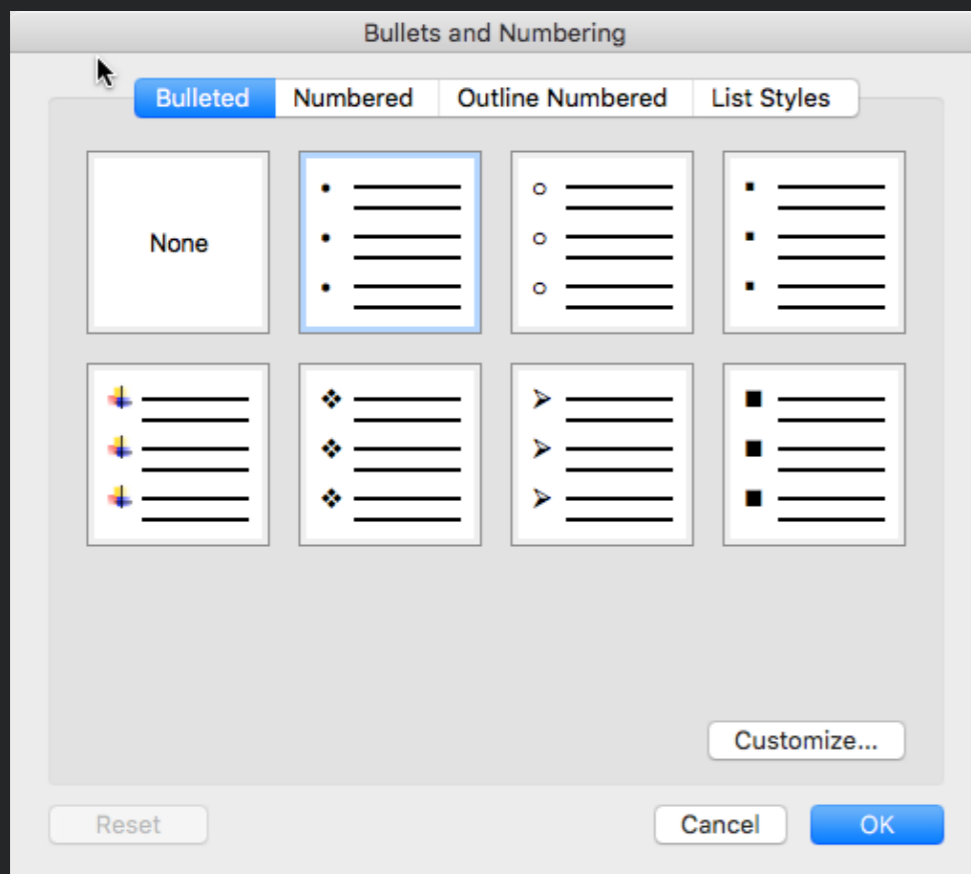
Breadcrumbs

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

The screenshot shows the Amazon.com search results page for 'lg tv 4k'. At the top, there is a navigation bar with the Amazon Prime logo, a search bar containing 'LED & LCD TVs' and 'lg tv 4k', and a 'BLACK FRIDAY DEALS WEEK' banner. Below the search bar, there are navigation links for 'Departments', 'Browsing History', 'Thomas's Amazon.com', and 'Today's Deals'. The main navigation bar includes 'Televitions & Video', 'Deals', 'Best Sellers', 'Televitions', 'Streaming Media Players', 'Blu-ray Players', 'Home Theater Systems', and 'A/V Accessories'. The search results section shows '1-24 of 147 results for Electronics : Television & Video : Televitions : LED & LCD TVs : "lg tv 4k"'. A breadcrumb trail is highlighted in yellow: 'Electronics : Television & Video : Televitions : LED & LCD TVs : "lg tv 4k"'. The left sidebar contains filters for 'Refine by', 'Delivery Day', 'Amazon Prime', 'Television Feature', and 'Television Resolution'. The main content area displays sponsored results for LG Super UHD TVs, including a 55-inch 4K Ultra HD Smart LED TV (2016 Model) for \$747.00 and a 60-inch 4K Ultra HD Smart LED TV (2016 Model) for \$1,297.00.

Progressive Disclosure

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





Effective 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?

Metaphors & Idioms



Metaphors

- One way to communicate what interface can do is through metaphors to the real world
- Uses existing mental models from 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



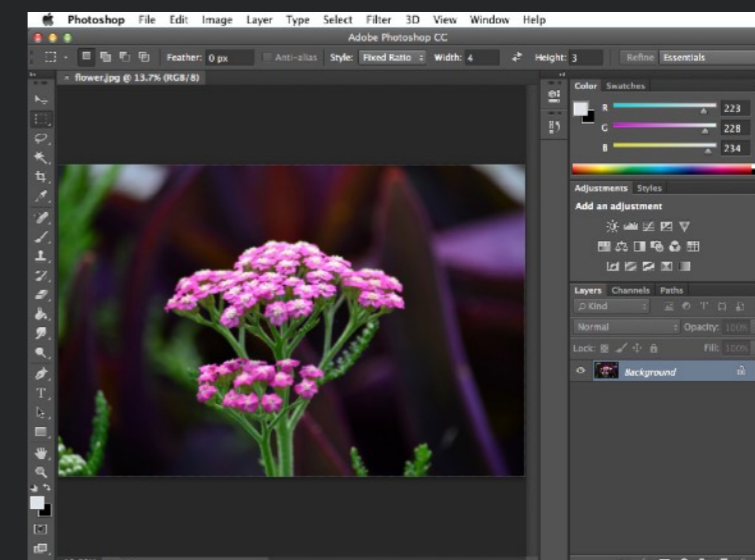
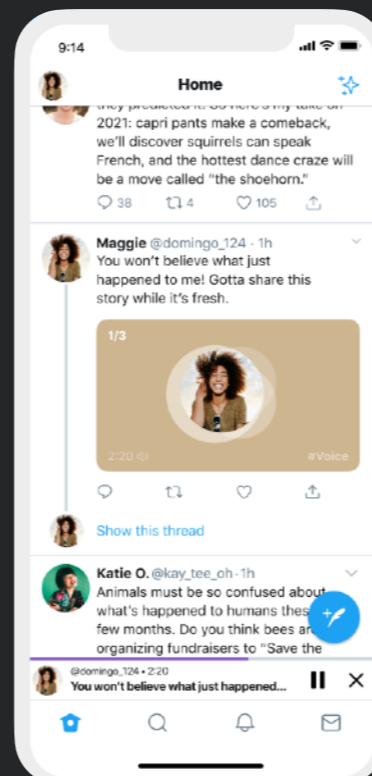
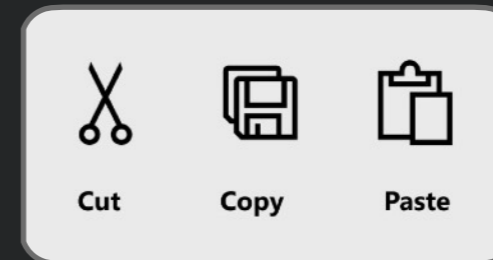
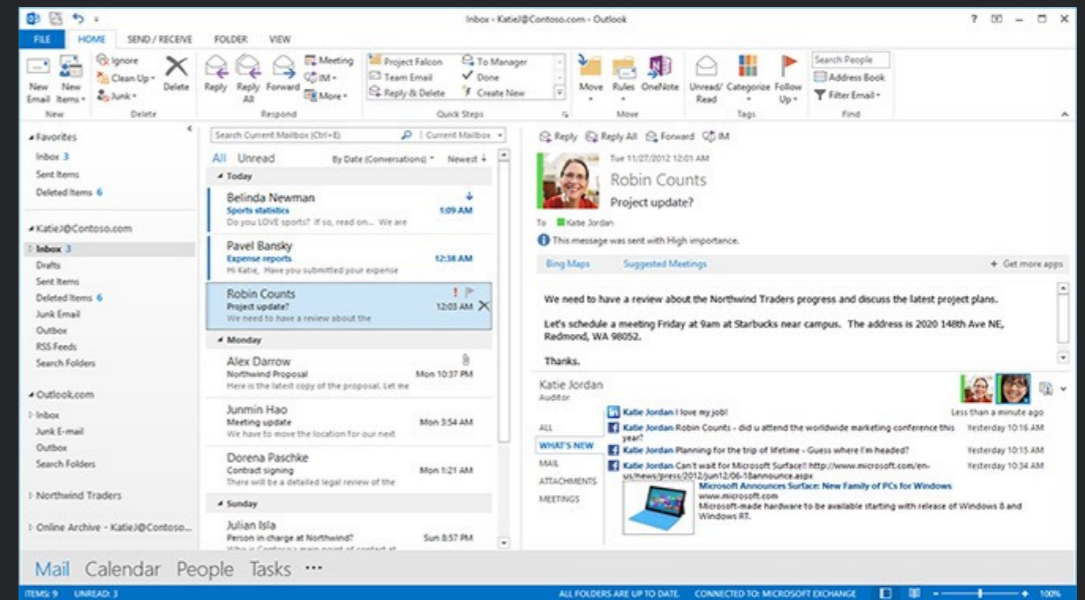


Alternative - Idioms

- 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

Examples of Idioms

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



Ordering User Actions





Task Structure

- In some cases, users must take actions in specific sequence
- Must input some information before being able to access subsequent information
 - e.g., must select a shipping method before seeing a final price
- To the extent possible, want to leave users in control of task (user control and freedom)
- But also do not want to distract users by making unrelated decisions in random order (flexibility and efficiency of use)
- And do not want to overwhelm users with too many options at a time (minimalist design)
- Good designs need to balance tradeoffs

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 during a flight booking process. The breadcrumb trail includes: Find Flights, Choose Flights, **Travelers**, Trip Options, Select Seats, Review & Pay, and Finish. The main heading is "Travelers" with a warning icon and the text "Check below for errors".

The flight summary box displays:

- Washington to Raleigh/ Durham
- 1 Adult
- Sunday January 10, 2016 – Monday January 11, 2016
- Your Trip Price: **\$203.70 USD**
- Link: [Baggage and Optional Charges](#)
- Button: Show Trip Details

The promotional banner for AAdvantage states:

- Earn 40,000 bonus miles, up to \$100 in statement credits, and your first checked bag free*!
- Link: [Learn More](#)
- Summary: Your Trip Price: \$203.70 USD, Statement Credit: - \$100.00 USD, Total: **\$103.70 USD**

The "Passenger Details" section includes:

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

The screenshot shows the American Airlines website interface. At the top, there is a navigation bar with the American Airlines logo, 'Plan Travel', 'Travel Information', and 'AAdvantage' links. A search bar is located in the top right corner. Below the navigation bar, a breadcrumb trail shows the current page: 'Find Flights' > 'Choose Flights' > 'Travelers' > 'Trip Options' > 'Select Seats' > 'Review & Pay' > 'Finish'. The main heading is 'Travelers', followed by a red warning icon and the text 'Check below for errors'. The flight details section shows 'Washington to Raleigh/ Durham' for '1 Adult' on 'Sunday January 10, 2016 - Monday January 11, 2016'. The 'Your Trip Price' is '\$203.70 USD'. Below this, there is a 'Show Trip Details' button. A promotional banner for AAdvantage miles is visible, offering 'Earn 40,000 bonus miles, up to \$100 in statement credits, and your first checked bag free*!'. A summary table shows the trip price and a statement credit. At the bottom, there is a 'Passenger Details' section with instructions and a 'TSA Privacy Notice' link.

Home Login Hello, THOMAS English Search aa.com

American Airlines Plan Travel Travel Information AAdvantage

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



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, 'Plan Travel', 'Travel Information', and 'AAdvantage' links. Below this is a secondary navigation bar with tabs for 'Find Flights', 'Choose Flights', 'Travelers', 'Trip Options', 'Select Seats', 'Review & Pay', and 'Finish'. The 'Travelers' section is active, displaying a flight from Washington to Raleigh/Durham for 1 adult on Sunday, January 10, 2016, to Monday, January 11, 2016. The trip price is \$203.70 USD. A 'Show Trip Details' button is visible. Below the flight details, there's a promotion for earning 40,000 bonus miles, up to \$100 in statement credits, and a free first checked bag. A summary table shows the trip price of \$203.70 USD and a statement credit of \$100.00 USD, resulting in a net price of \$103.70 USD. The 'Passenger Details' section is partially visible, with a note about entering names as they appear on government-issued photo identification.

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:
\$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



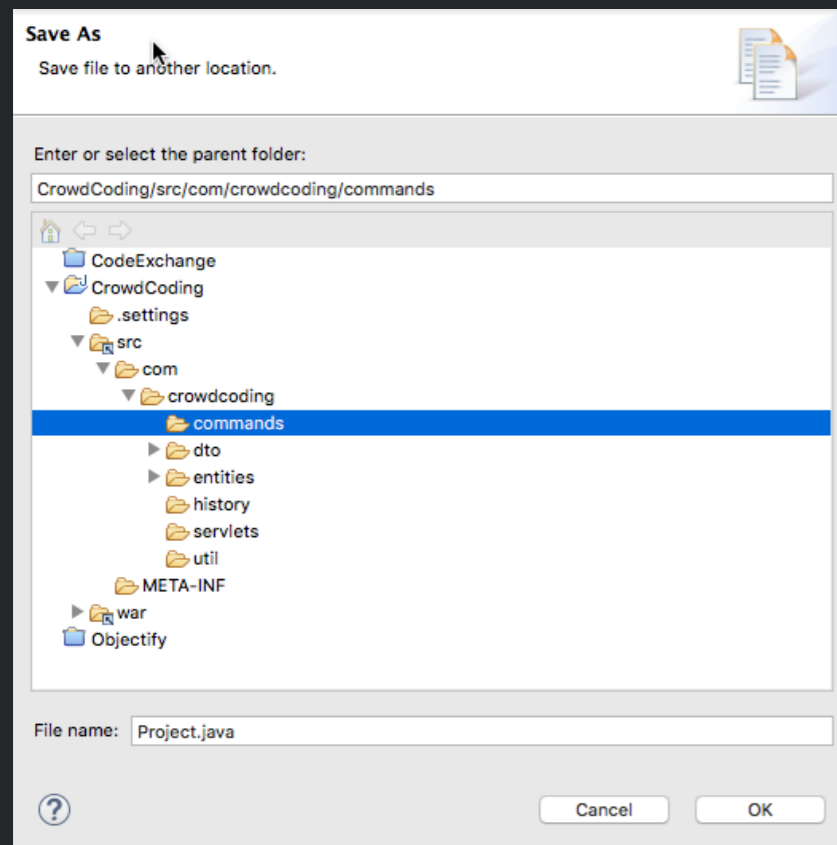
Orchestration & Interaction Flow

- 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

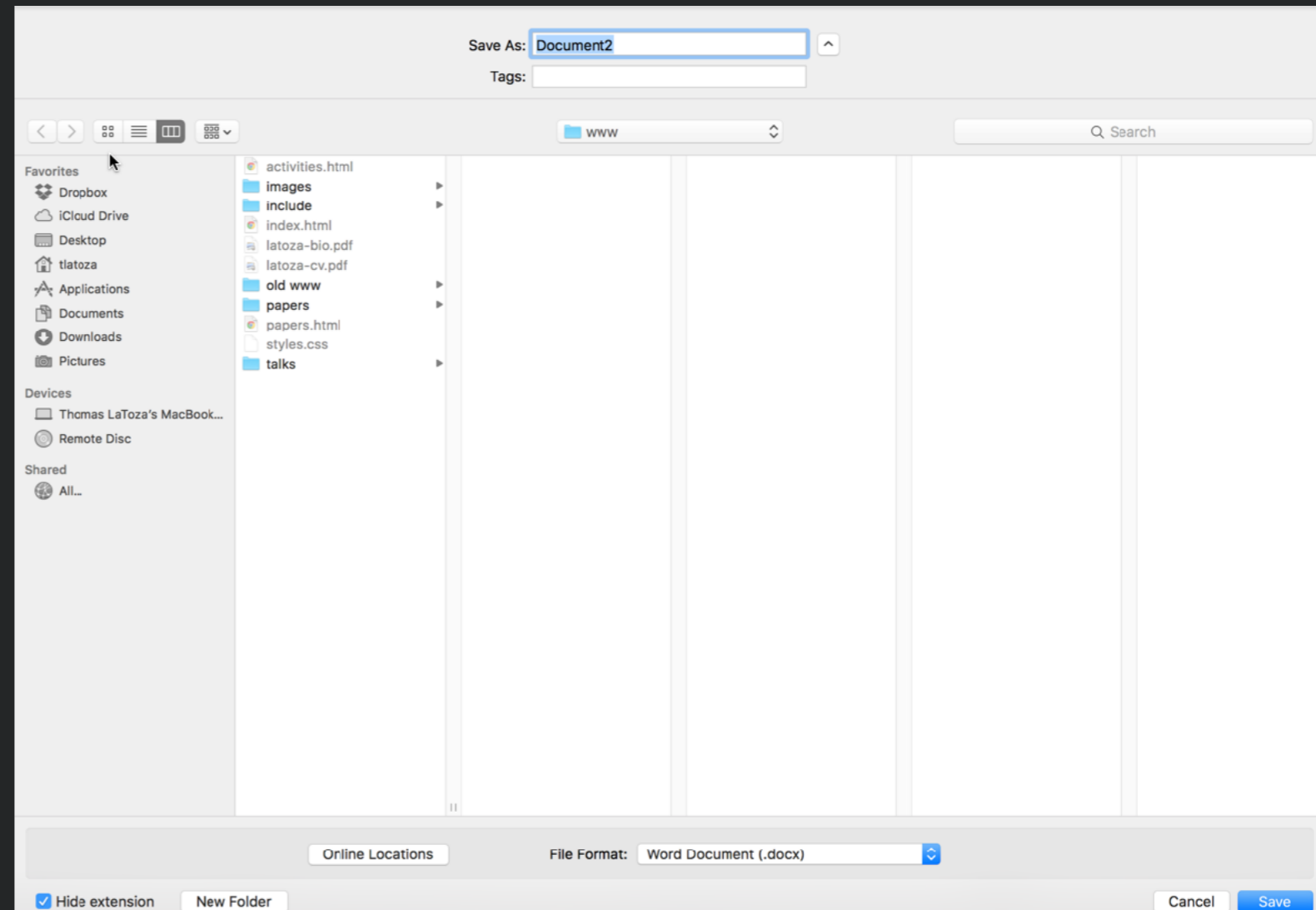
Anticipate Likely Next Actions

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

What if folder does not exist?



vs.





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

Group Activity



In Class Activity: Design a Course Catalog & Registration System



- In groups of 2 or 3
 - Design a course catalog & registration system
 - Create sketches showing key screens
 - Should support
 - browsing course catalog, registering for classes, waitlists
 - building plan of courses to take over multiple semesters to fulfill degree requirements



Acknowledgements

- Slides adapted from Dr. Thomas Latoza's SWE 432 course