Site Design

SWE 432, Fall 2016

Design and Implementation of Software for the Web

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What's left?

- Project Reflection now out, due 12/8
- Of by one errors:
  - 2 more quizes
  - No HW12
- Final exam

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?

Analogy: Buying a chainsaw

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

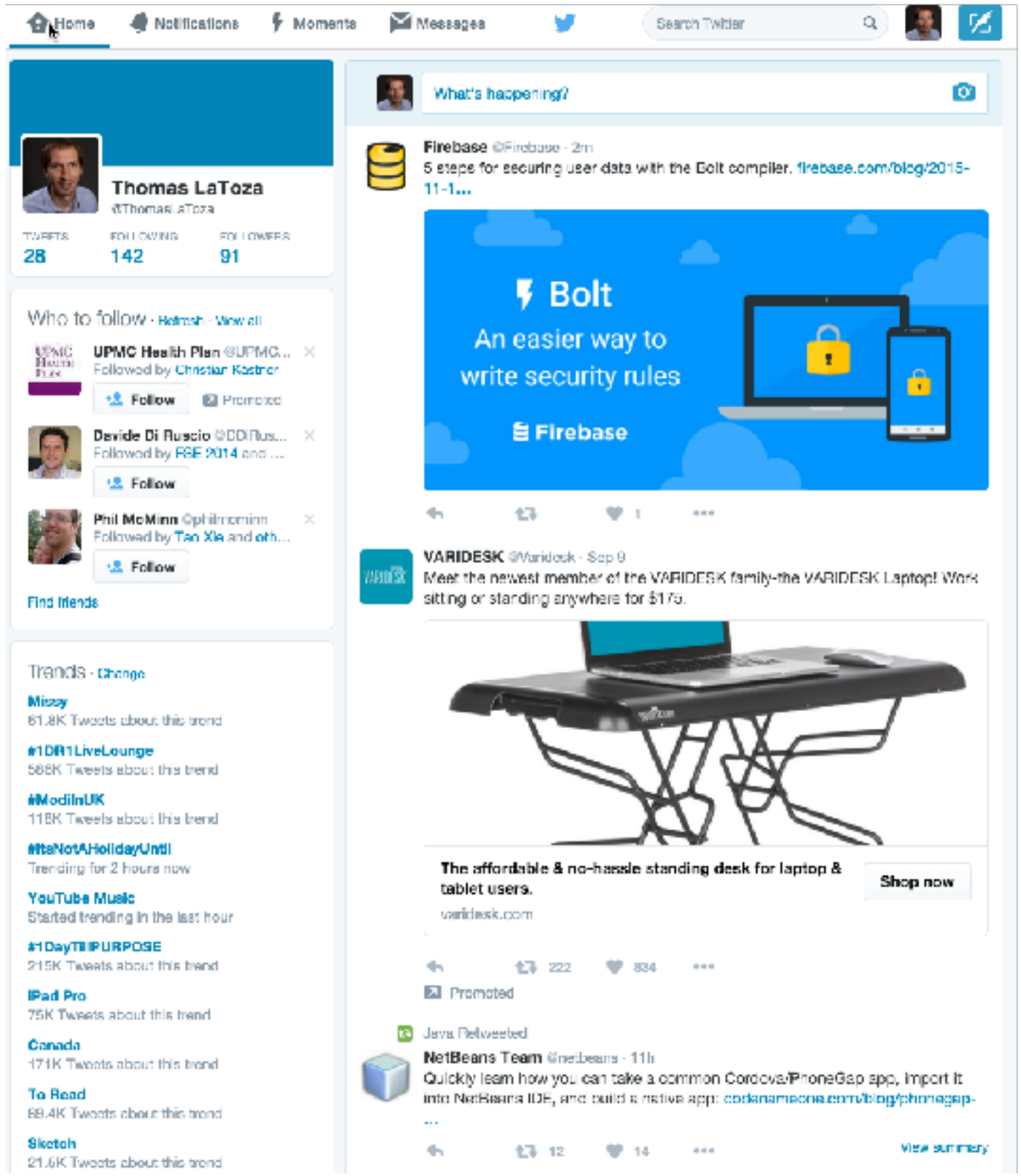
Site design

- 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
- 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?

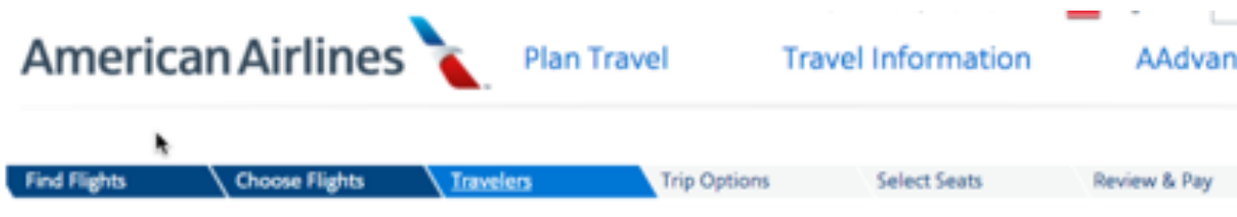


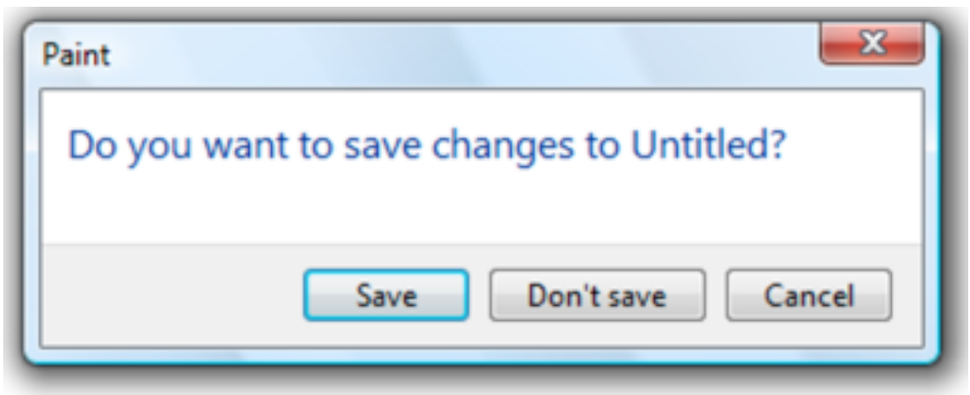
Clear system task model

- 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

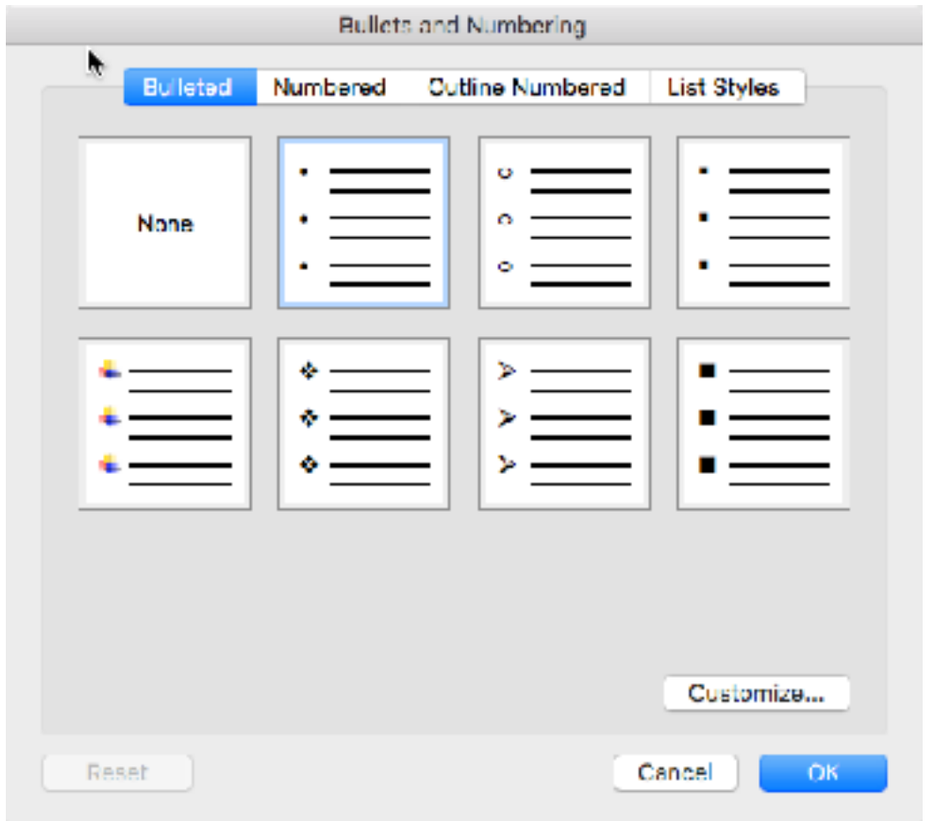
- Interaction flow - the next thing the interface wants to do is exactly what user expects
  - Follow users' mental model
  - Let user direct software
  - Keep all related tools available
  - Surprises interrupt interaction flow
  - Interfaces should be invisible

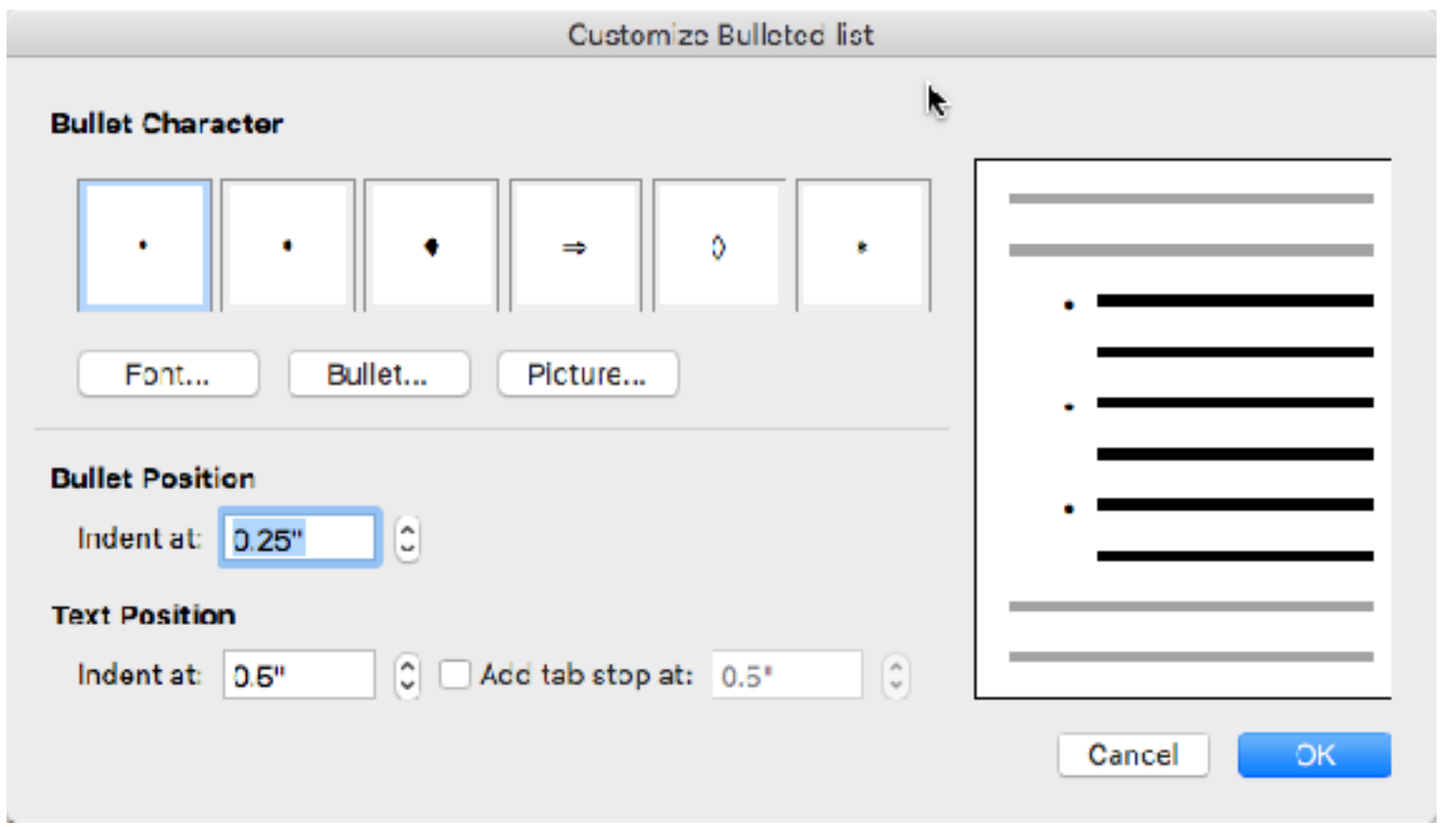
Interaction flow guidelines

- 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

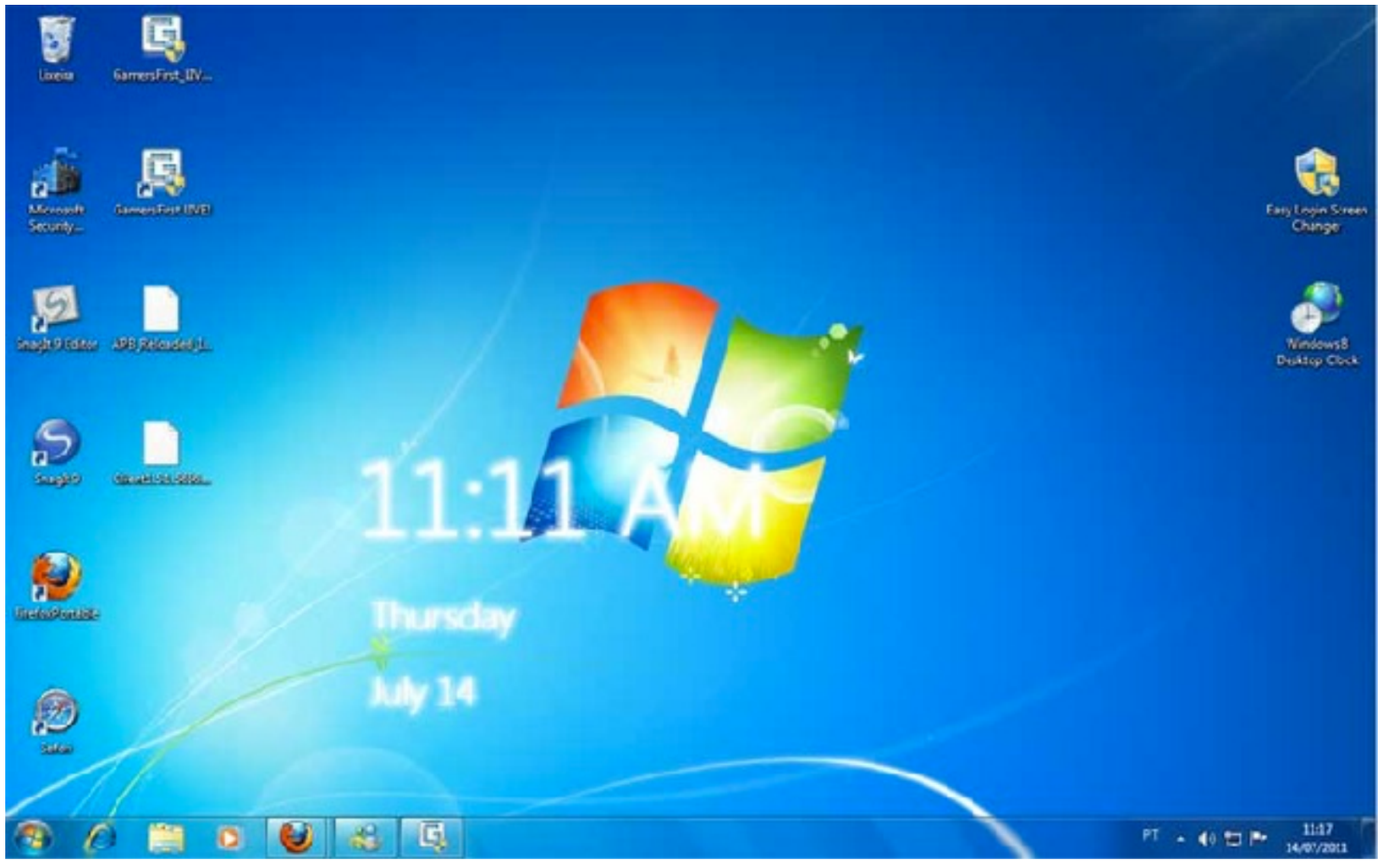




Metaphors & idioms

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

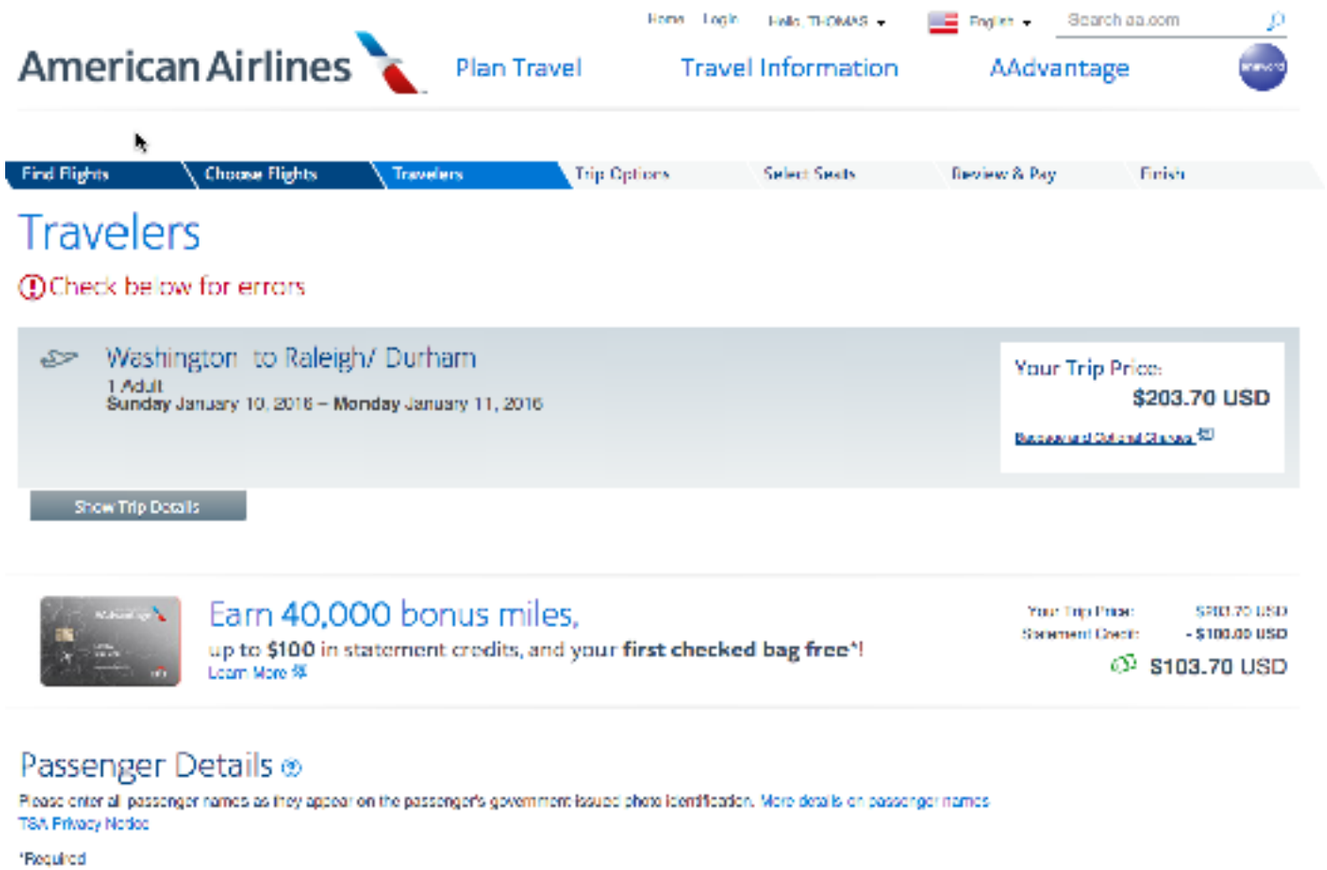
Task Structure

Task structure

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

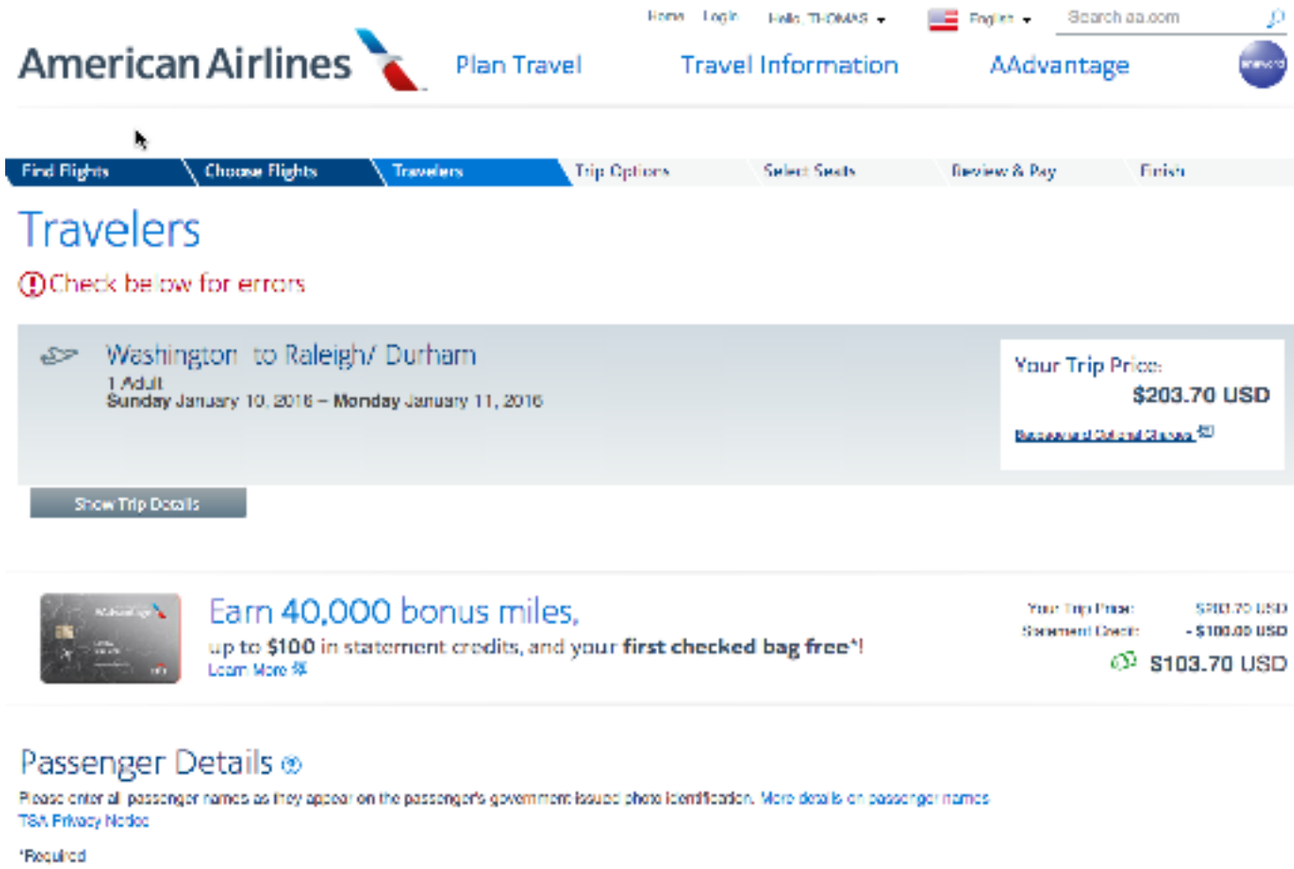
Separate long tasks into sequences

- Reduce STM 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

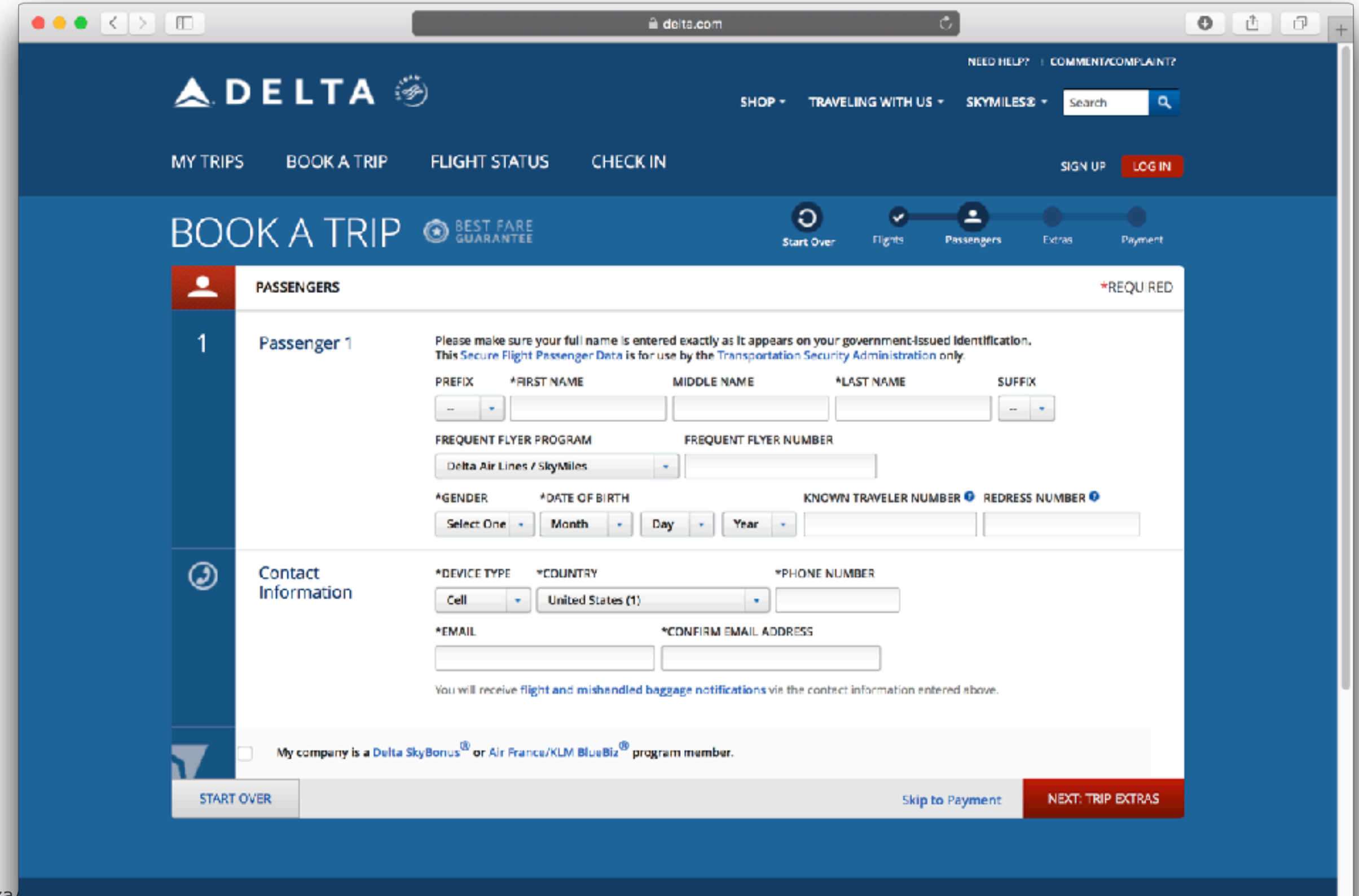


Design for flexibility & efficiency

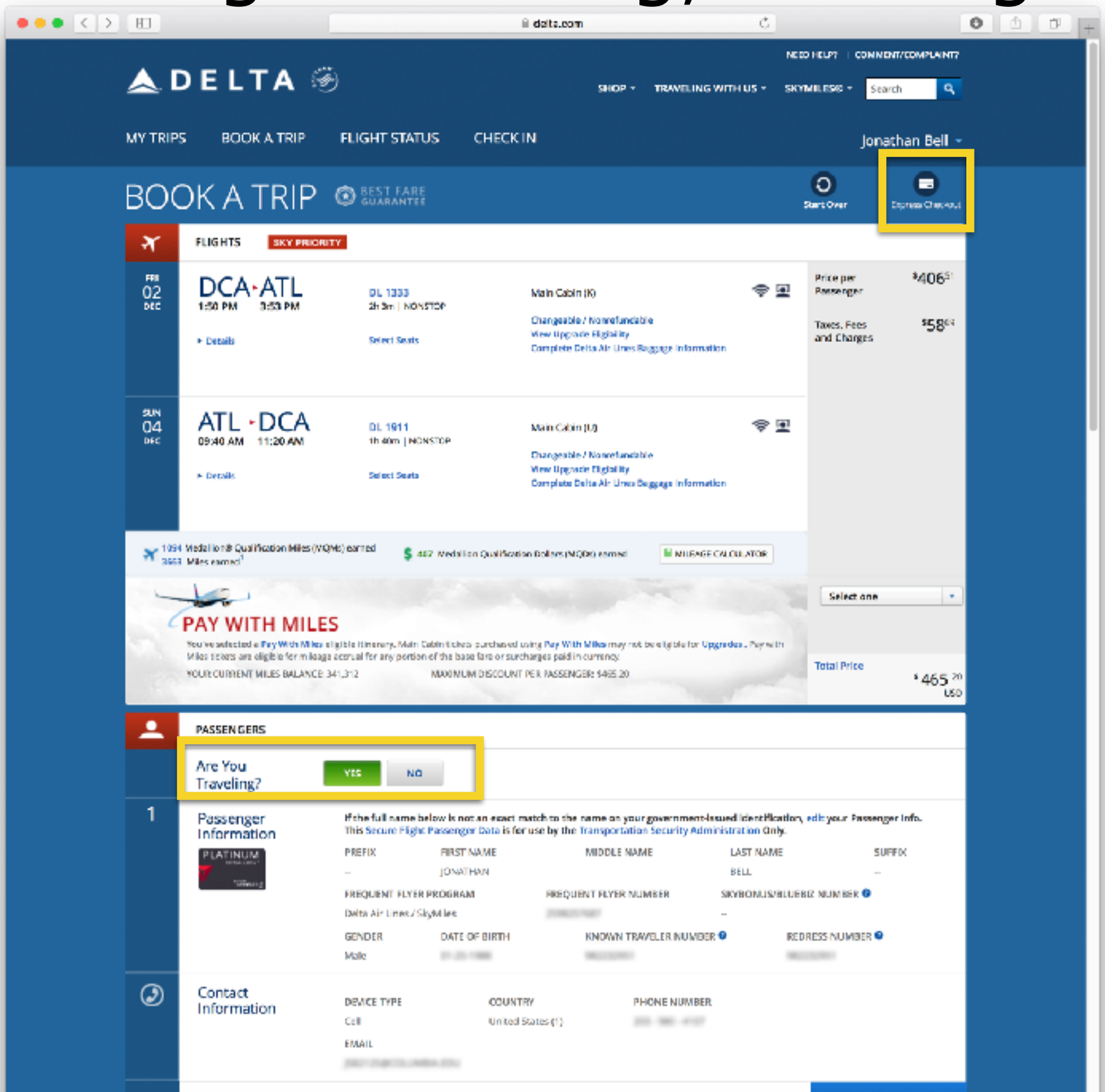
- Users may take paths never envisioned by designer
- Using studies to identify different task flows, design flexible support for each



Delta: Flight Booking, New User



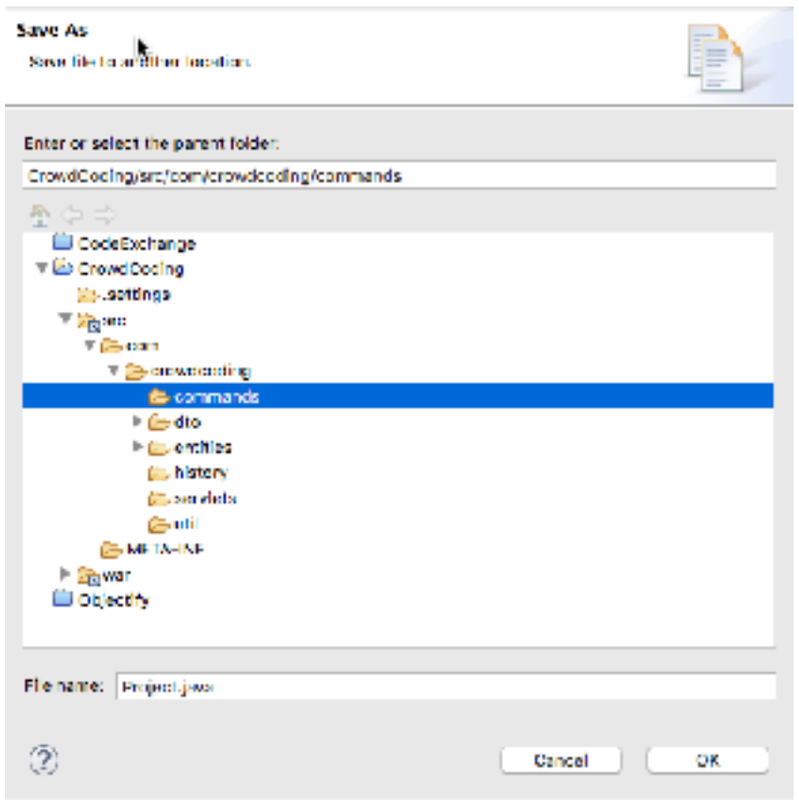
Delta: Flight Booking, Existing User



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?



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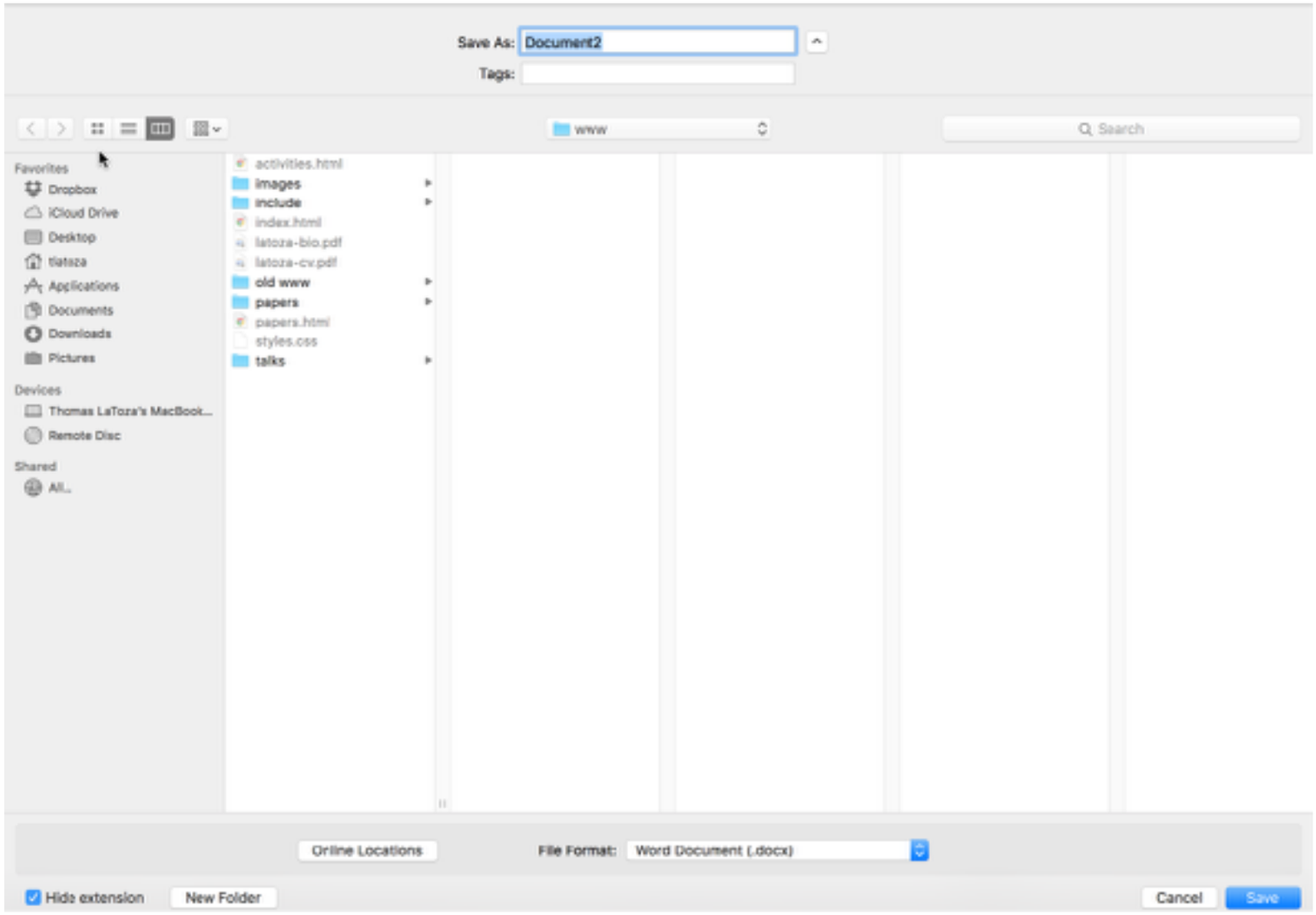
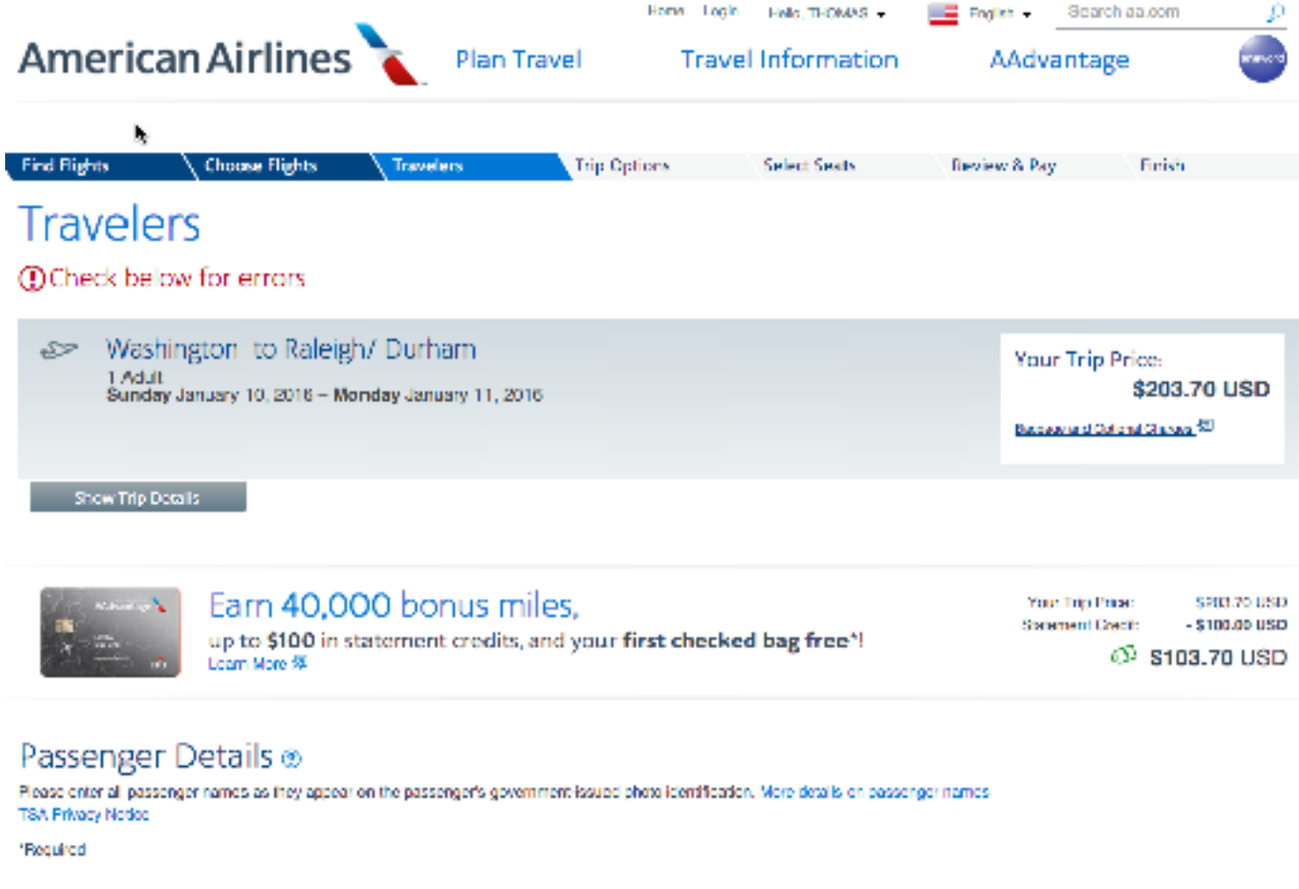


Keep users in control

- 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

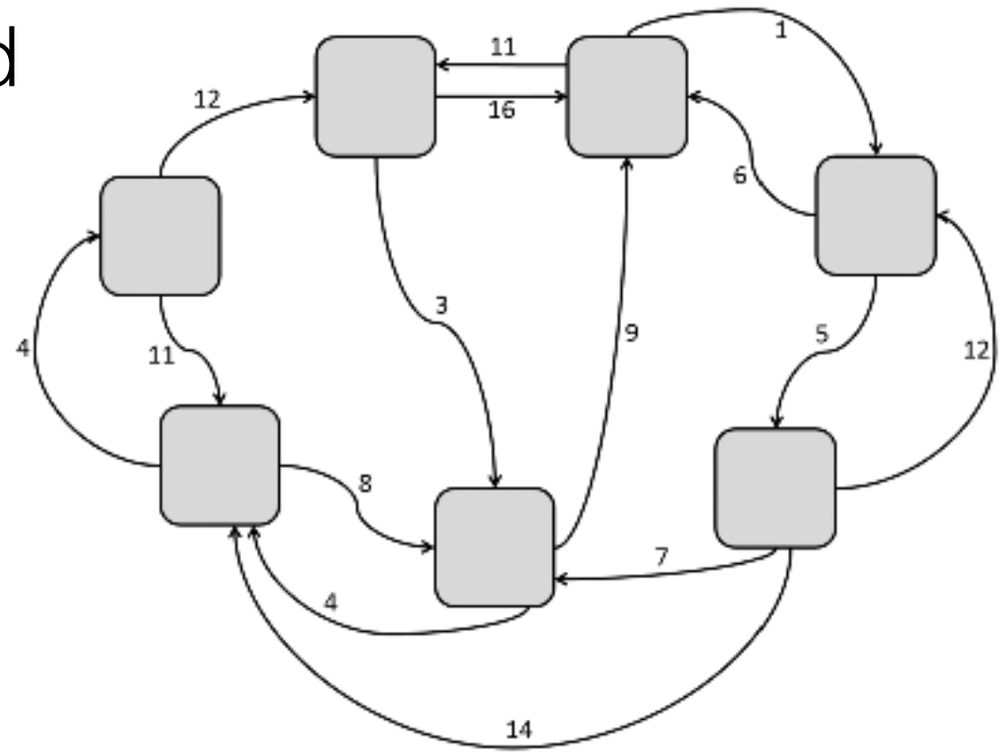
- Many different contexts where navigation is important
  - Among windows & screens
  - Among panes or frames in a window
  - Among tools and menus
  - Within an information space

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

- 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

Scent

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

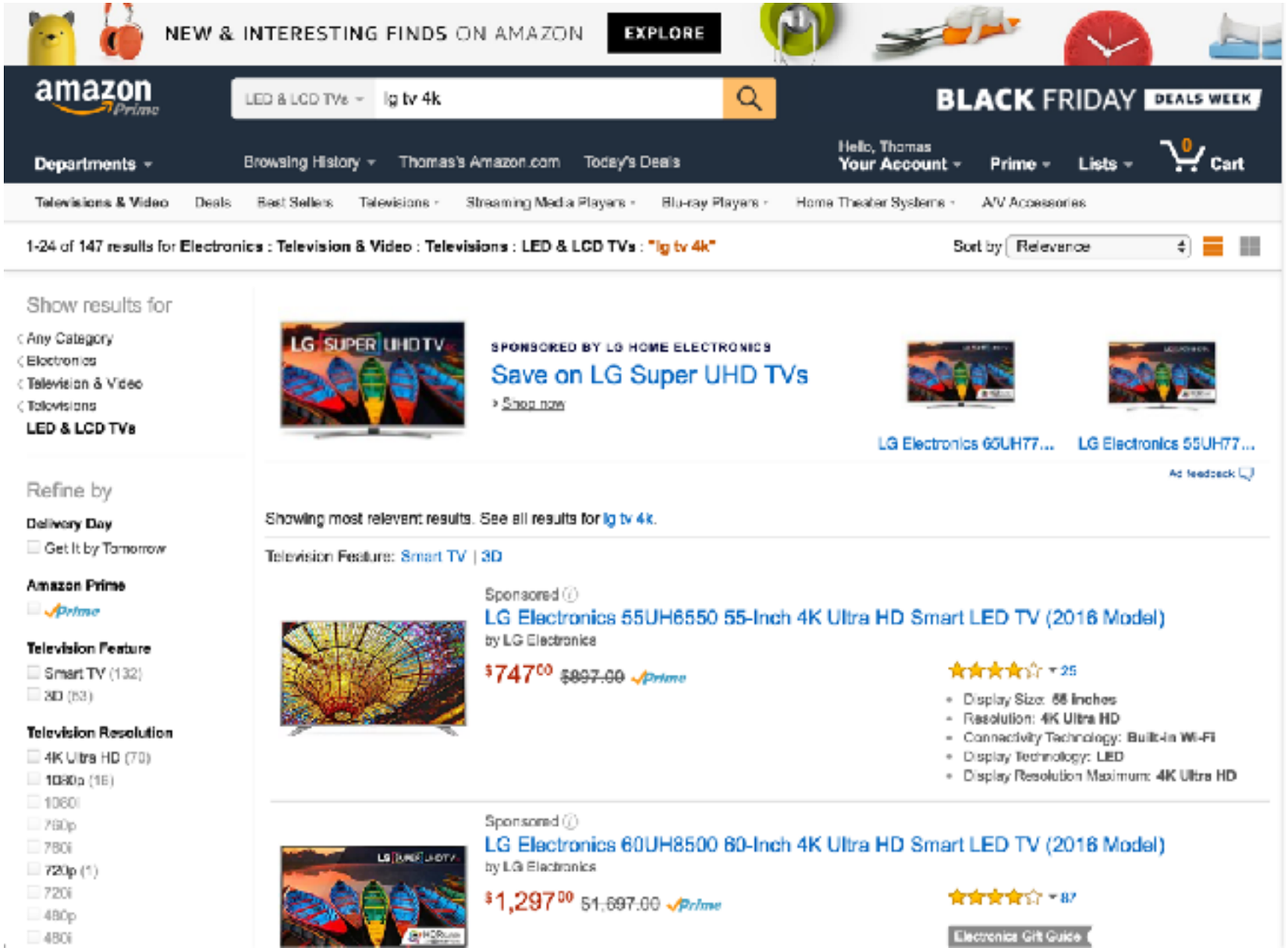
Simplified mathematical model

- 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]]

Some design implications of information foraging theory

- Organize information into functionally **related** groups
- Design effective **cues**, describing what will be found by traversing links
- Match **expectations** of user's mental model
- Provide **search**

Web navigation conventions



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Web navigation conventions

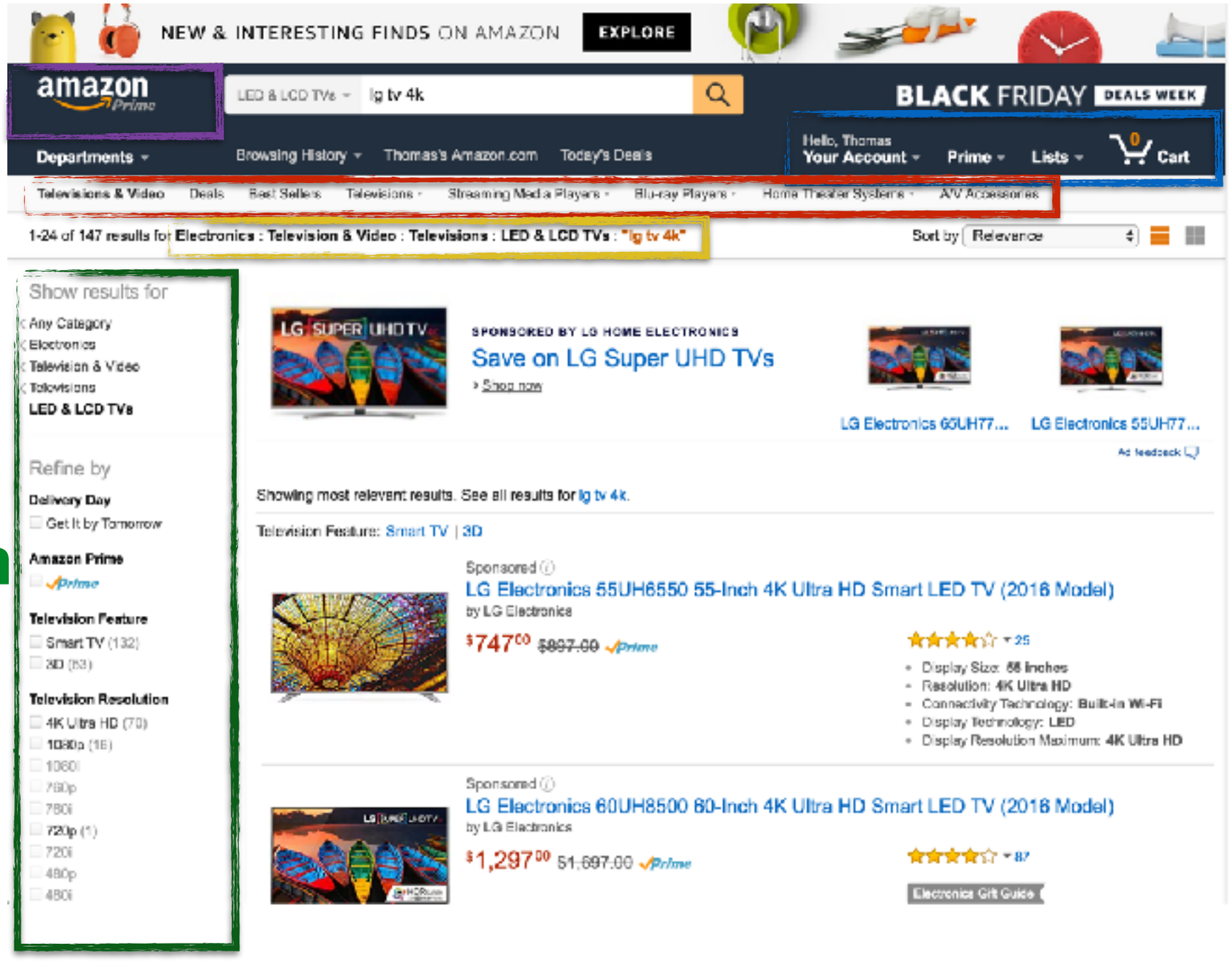
Site ID

You are here

Local navigation

Utilities

Sections



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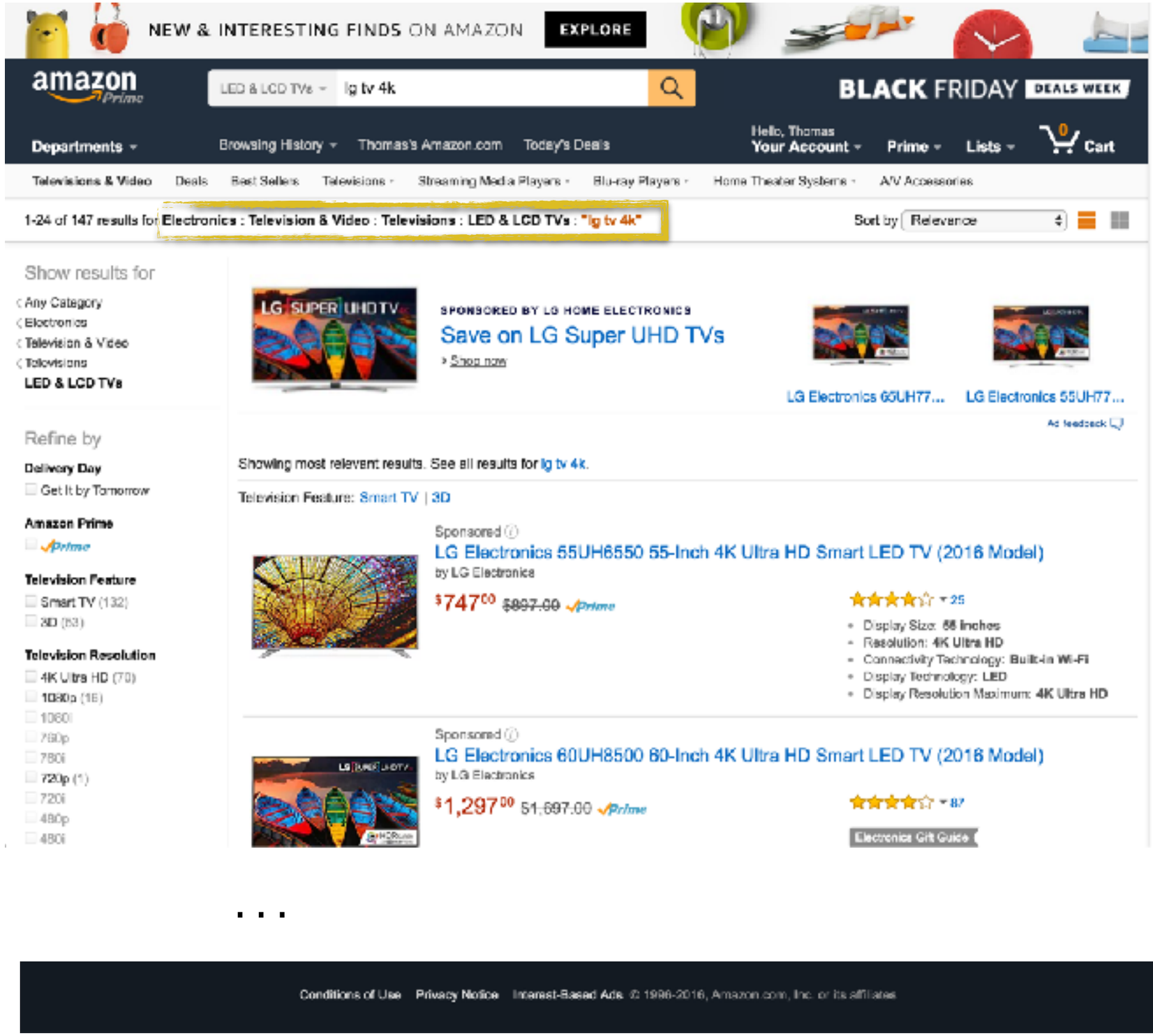
Footer navigation

Persistent navigation

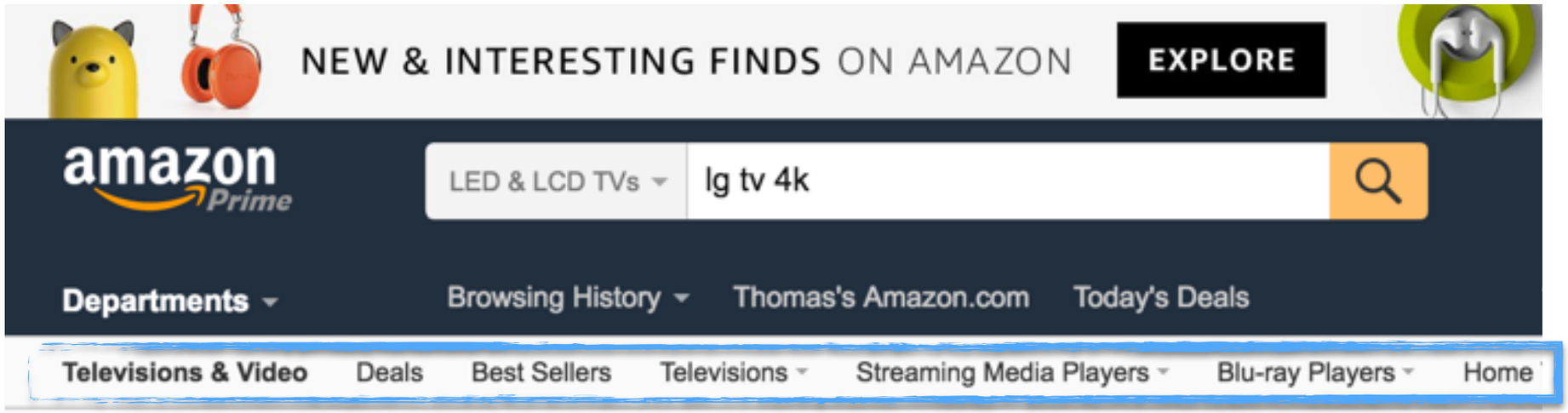
- Forms a common idiom users already understand
- Gives instant confirmation that still on the same site
- Supports consistency and standards
  - If *all* of your pages function same way, users know how to do actions & what to expect
    - Ok for specialized page like forms that are clearly different 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?

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