

Site Design

SWE 432, Fall 2018

Web Application Development

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?

The screenshot displays the Twitter mobile application interface. At the top, there is a navigation bar with icons for Home, Notifications, Moments, Messages, and a search bar labeled "Search Twitter".

The main content area is divided into two columns. The left column features a user profile for **Thomas LaToza** (@ThomasLaToza) with 28 tweets, 142 following, and 91 followers. Below the profile is a "Who to follow" section with three suggestions: UPMC Health Plan, Davide Di Ruscio, and Phil McMinn. At the bottom of this section is a "Find friends" button. Below that is a "Trends" section listing various hashtags such as #Miszy, #1DR1LiveLounge, #ModiinUK, #ItsNotAHolidayUntil, YouTube Music, #1DayTIPURPOSE, iPad Pro, Canada, To Read, and Sketch, each with a count of tweets.

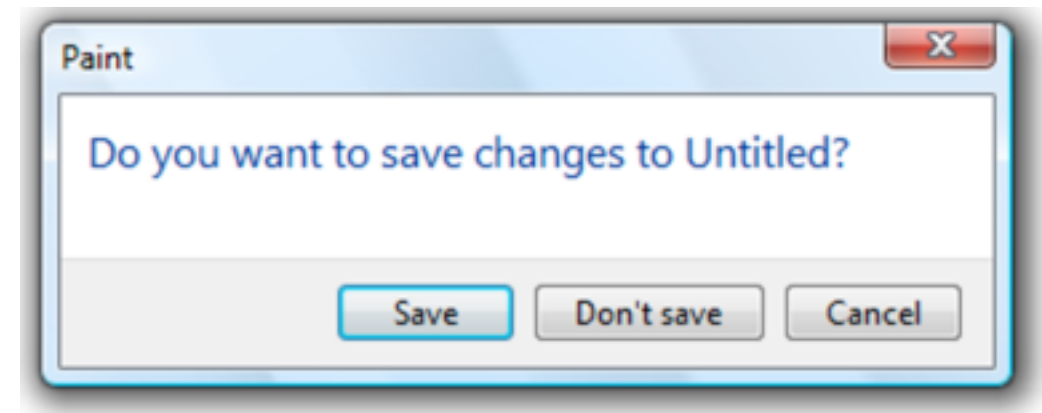
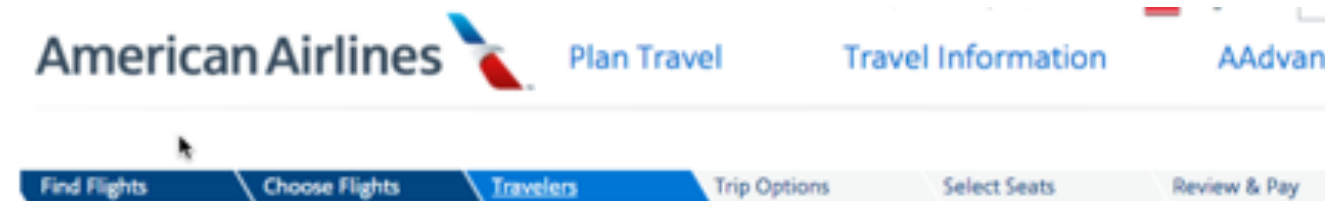
The right column shows a tweet from **Firebase** (@Firebase) posted 2 minutes ago. The tweet text is "5 steps for securing user data with the Bolt compiler. firebase.com/blog/2015-11-1...". The tweet includes a large image advertisement for **Bolt**, described as "An easier way to write security rules" by Firebase. The image shows a laptop and a smartphone with padlocks on their screens. Below the image are icons for reply, retweet (1), and like (1). Below the tweet is a promoted tweet from **VARIDESK** (@Varidesk) dated Sep 9, advertising a standing desk for laptops and tablets for \$179. The image shows a black standing desk with a laptop on it. Below the image is the text "The affordable & no-hassle standing desk for laptop & tablet users." and a "Shop now" button. Below the promoted tweet are icons for reply, retweet (222), and like (834). At the bottom of the right column is another tweet from the **NetBeans Team** (@netbeans) dated 11h, with a link to a blog post about building a native app from a Cordova/PhoneGap app. Below this tweet are icons for reply, retweet (12), and like (14), and a "View summary" link.

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

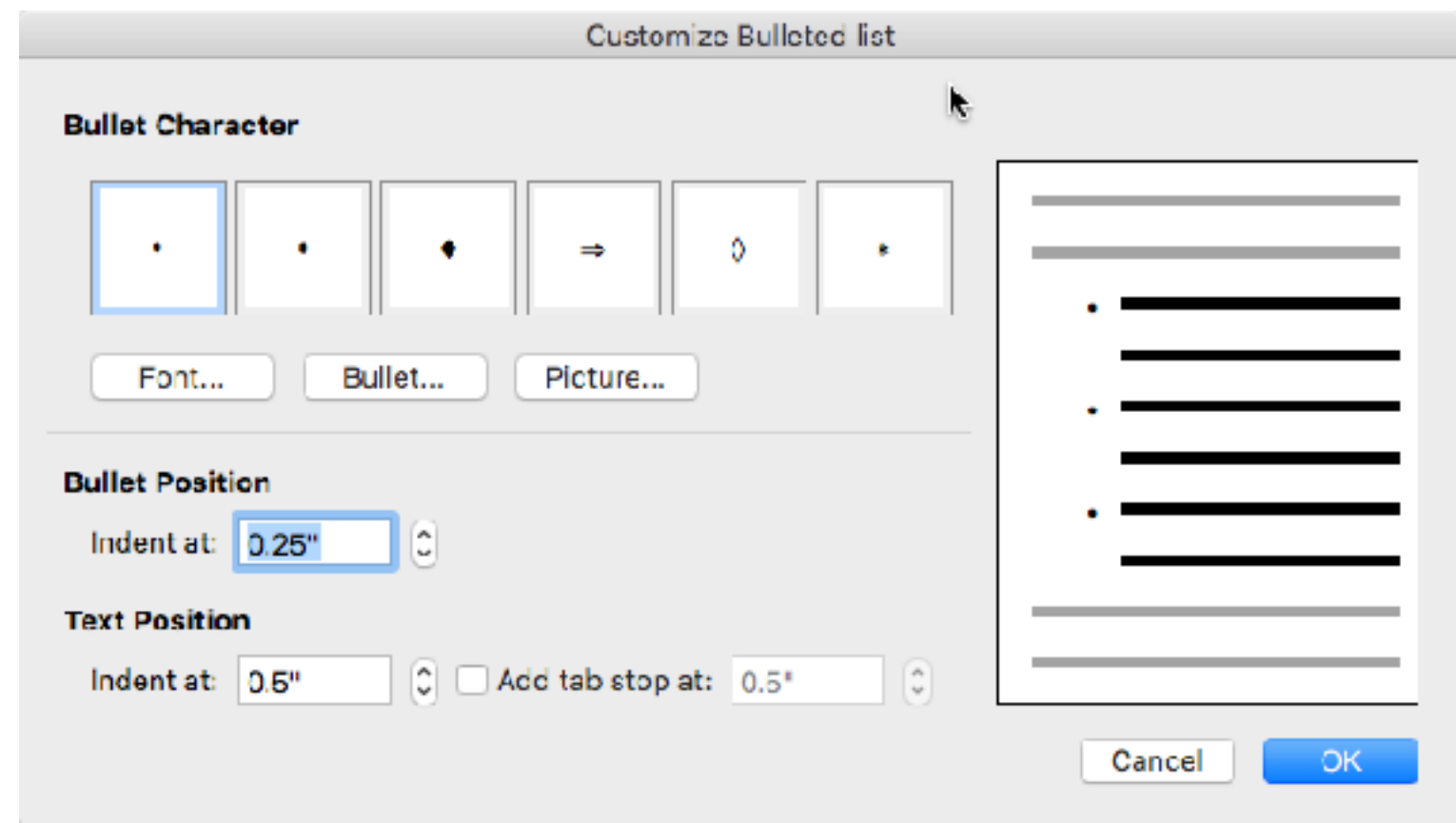
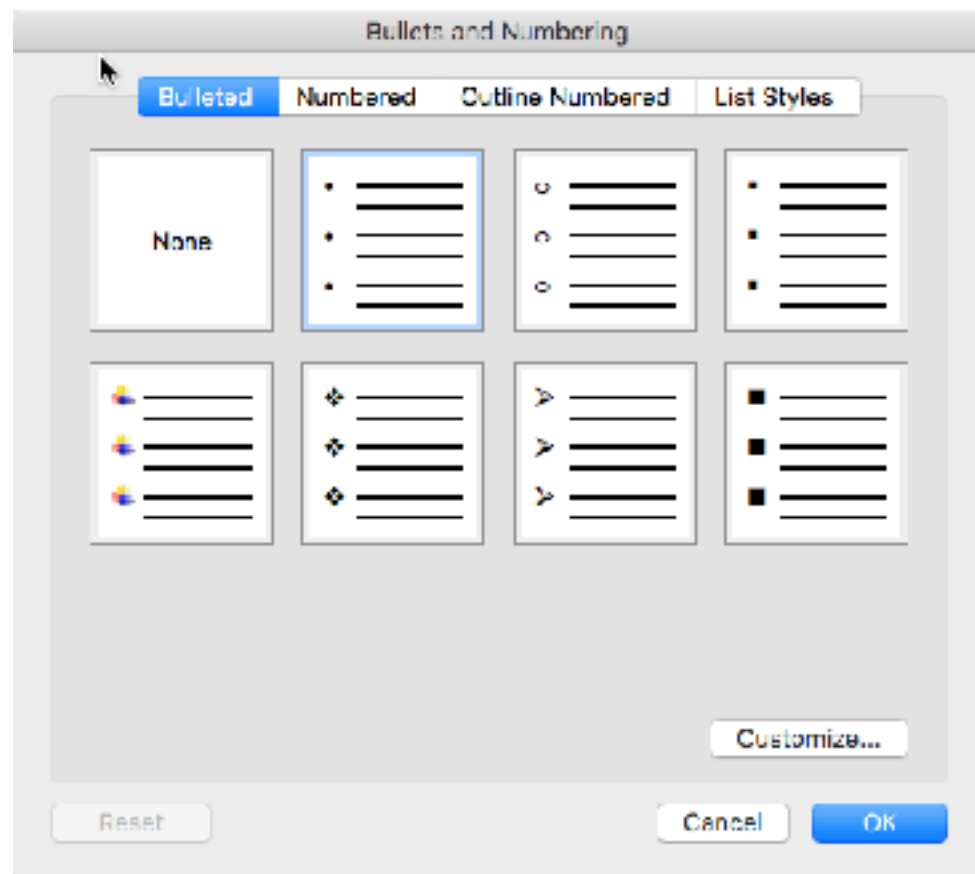
- Interaction flow - the next thing the interface wants to do is exactly what user expects
 - Follow users' mental model
 - Let user direct software
 - Keep all related tools available
- Surprises interrupt interaction flow
- Interfaces should be invisible

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

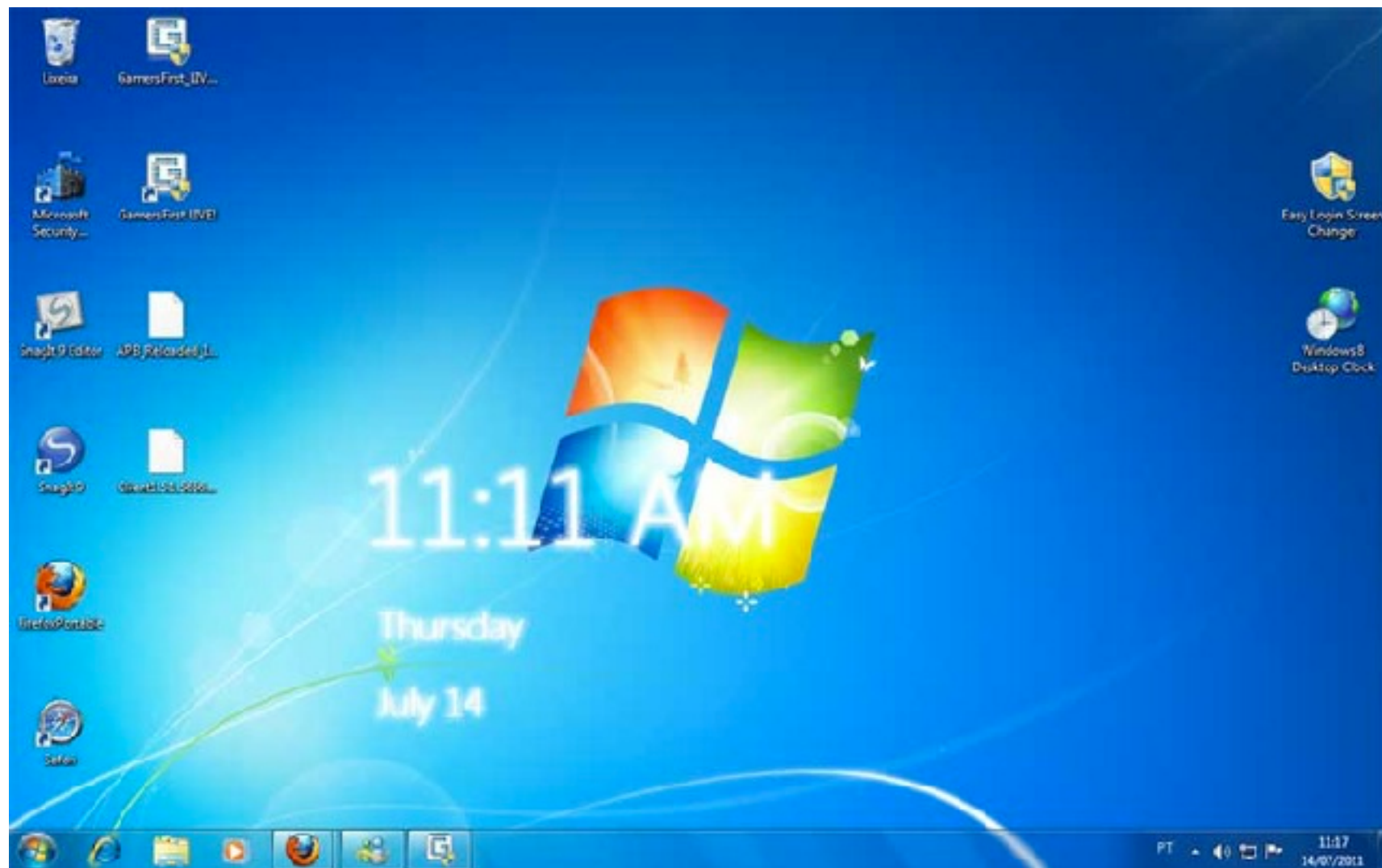
- a.k.a. details on demand
- Separate information & commands into layers
- Present most frequently used information & commands first



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

American Airlines Plan Travel Travel Information AAdvantage

Home Login Help 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**
[View our Fare Rules](#)

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

The screenshot shows the American Airlines website interface during a flight booking process. The top navigation bar includes the American Airlines logo, 'Plan Travel', 'Travel Information', and 'AAdvantage'. A progress bar at the top indicates the current step is 'Travelers', with other steps being 'Find Flights', 'Choose Flights', 'Trip Options', 'Select Seats', 'Review & Pay', and 'Finish'. The main content area is titled 'Travelers' and includes a warning icon and text: 'Check below for errors'. Below this, a flight summary is displayed: 'Washington to Raleigh/ Durham', '1 Adult', and 'Sunday January 10, 2016 - Monday January 11, 2016'. To the right of the summary, the 'Your Trip Price' is shown as '\$203.70 USD'. A 'Show Trip Details' button is located below the flight summary. At the bottom of the page, there is a promotional banner for AAdvantage miles: 'Earn 40,000 bonus miles, up to \$100 in statement credits, and your first checked bag free*!'. To the right of this banner, the updated 'Your Trip Price' is shown as '\$103.70 USD' after a '\$100.00 USD' statement credit. The 'Passenger Details' section is partially visible at the bottom, with a note: '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

NEED HELP? | COMMENT/COMPLAINT?

DELTA

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 interface for an existing user, Jonathan Bell. The user is logged in, and the 'BOOK A TRIP' section is active. The flight details for DCA to ATL on Dec 02 and ATL to DCA on Dec 04 are displayed. The total price is \$465.20 USD. The 'PASSENGERS' section is highlighted, showing the 'Are You Traveling?' question with 'YES' selected. The passenger information for Jonathan Bell is displayed, including his Delta Air Lines SkyMiles status and contact details.

DELTA

NEED HELP? | COMMENT/COMPLAINT

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 | Continue Checkout

FLIGHTS SKY PRIORITY

FRI 02 DEC DCA - ATL 1:50 PM - 3:53 PM DL 1333 2h 3m | NONSTOP Main Cabin (K) Price per Passenger \$406⁵¹

SUN 04 DEC ATL - DCA 09:40 AM - 11:20 AM DL 1611 1h 40m | NONSTOP Main Cabin (J) Taxes, Fees and Charges \$58⁶⁴

1094 Medallion Qualification Miles (MQM) earned 2003 Miles earned

PAY WITH MILES

YOUR CURRENT MILES BALANCE 341,312 MAXIMUM DISCOUNT PER PASSENGER \$425.20

Total Price \$465.20 USD

PASSENGERS

Are You Traveling? YES NO

1 Passenger Information

PLATINUM

Are you traveling? This Secure Flight Passenger Data is for use by the Transportation Security Administration Only.

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

FREQUENT FLYER PROGRAM	FREQUENT FLYER NUMBER	SKYMILES/MILES NUMBER
Delta Air Lines/SkyMiles		--

GENDER	DATE OF BIRTH	KNOWN TRAVELER NUMBER	REDRESS NUMBER
Male			

Contact Information

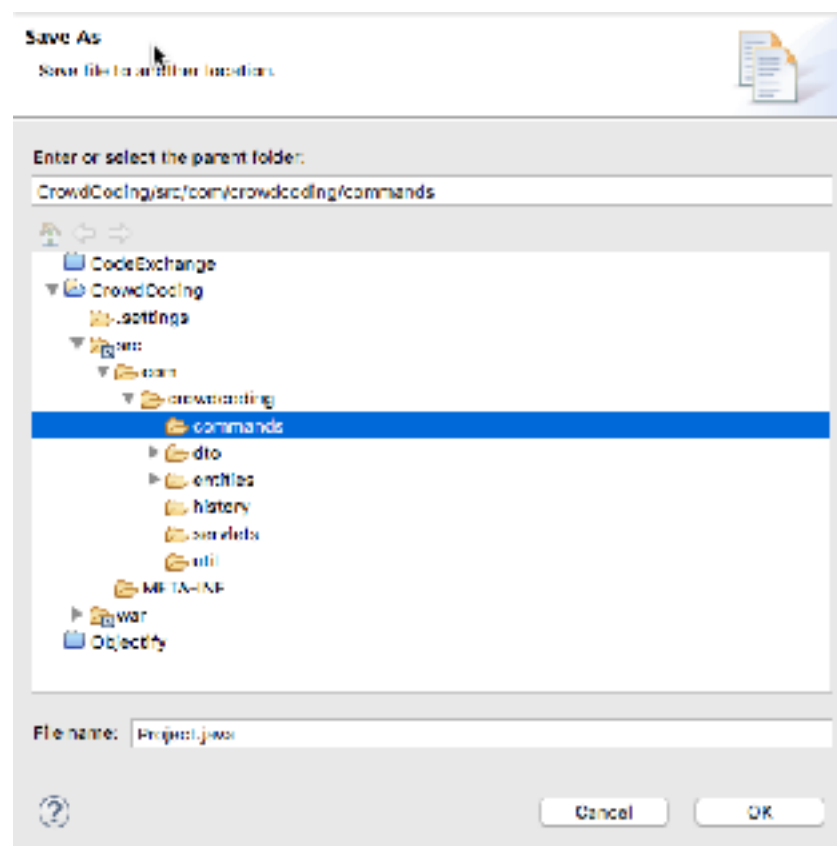
DEVICE TYPE	COUNTRY	PHONE NUMBER
Cell	United States (1)	202-962-4107

EMAIL

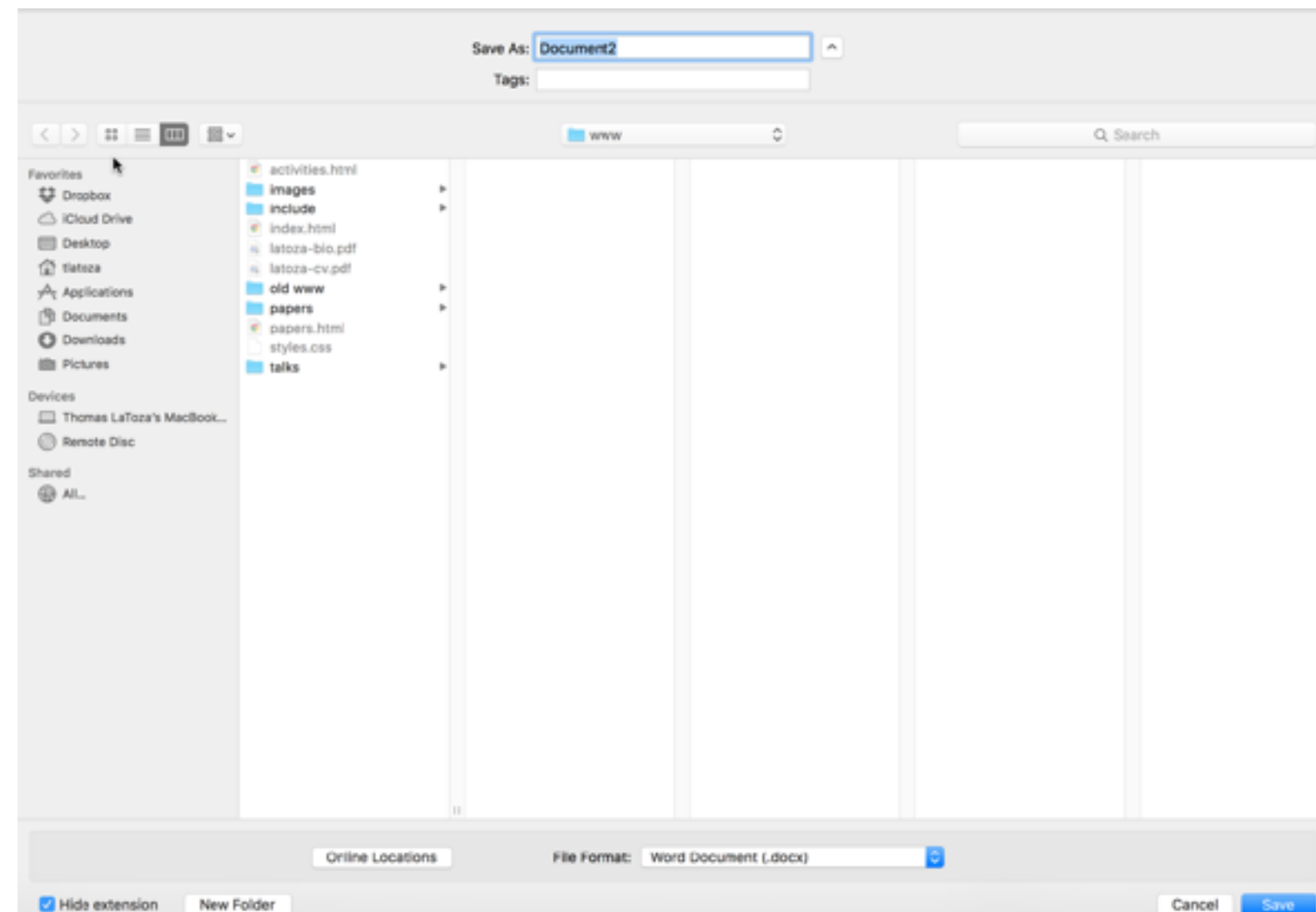
Anticipate likely next actions

- 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 is 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' (which is highlighted), 'Trip Options', 'Select Seats', 'Review & Pay', and 'Finish'. The main content area is titled 'Travelers' and includes a warning icon and the text 'Check below for errors'. Below this, there is a flight summary card for 'Washington to Raleigh/ Durham' for '1 Adult' on 'Sunday January 10, 2016 - Monday January 11, 2016'. To the right of this card, the 'Your Trip Price' is listed as '\$203.70 USD'. Below the flight summary is a 'Show Trip Details' button. Further down, there is a promotional banner for 'Earn 40,000 bonus miles, up to \$100 in statement credits, and your first checked bag free*!'. To the right of this banner, a price breakdown shows 'Your Trip Price: \$203.70 USD' and 'Statement Credit: -\$100.00 USD', resulting in a total of '\$103.70 USD'. At the bottom, there is a 'Passenger Details' section with a warning icon and instructions: 'Please enter all passenger names as they appear on the passenger's government issued photo identification. More details on passenger names'. Below this is a 'TSA Privacy Notice' link and a '*Required' note.

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

Departments [Browsing History](#) [Thomas's Amazon.com](#) [Today's Deals](#) Hello, Thomas [Your Account](#) [Prime](#) [Lists](#) [Cart](#)

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
- 780i
- 720p (1)
- 720i
- 480p
- 480i

Showing most relevant results. See all results for [lg tv 4k](#).

Television Feature: [Smart TV](#) | [3D](#)

Sponsored by LG HOME ELECTRONICS

Save on LG Super UHD TVs

LG Electronics 65UH77... LG Electronics 55UH77...

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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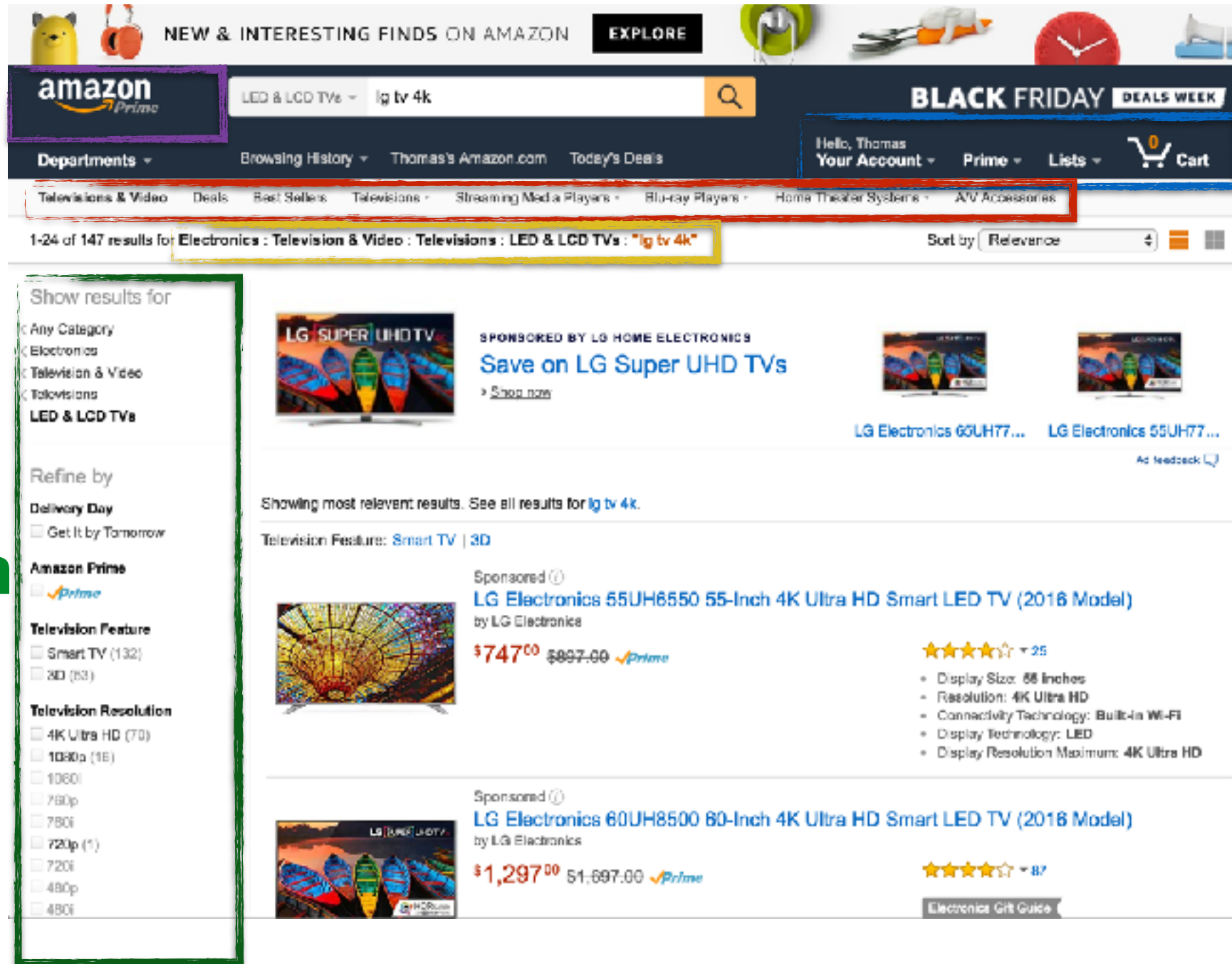
Web navigation conventions

Site ID

You are here

Local navigation

Footer navigation



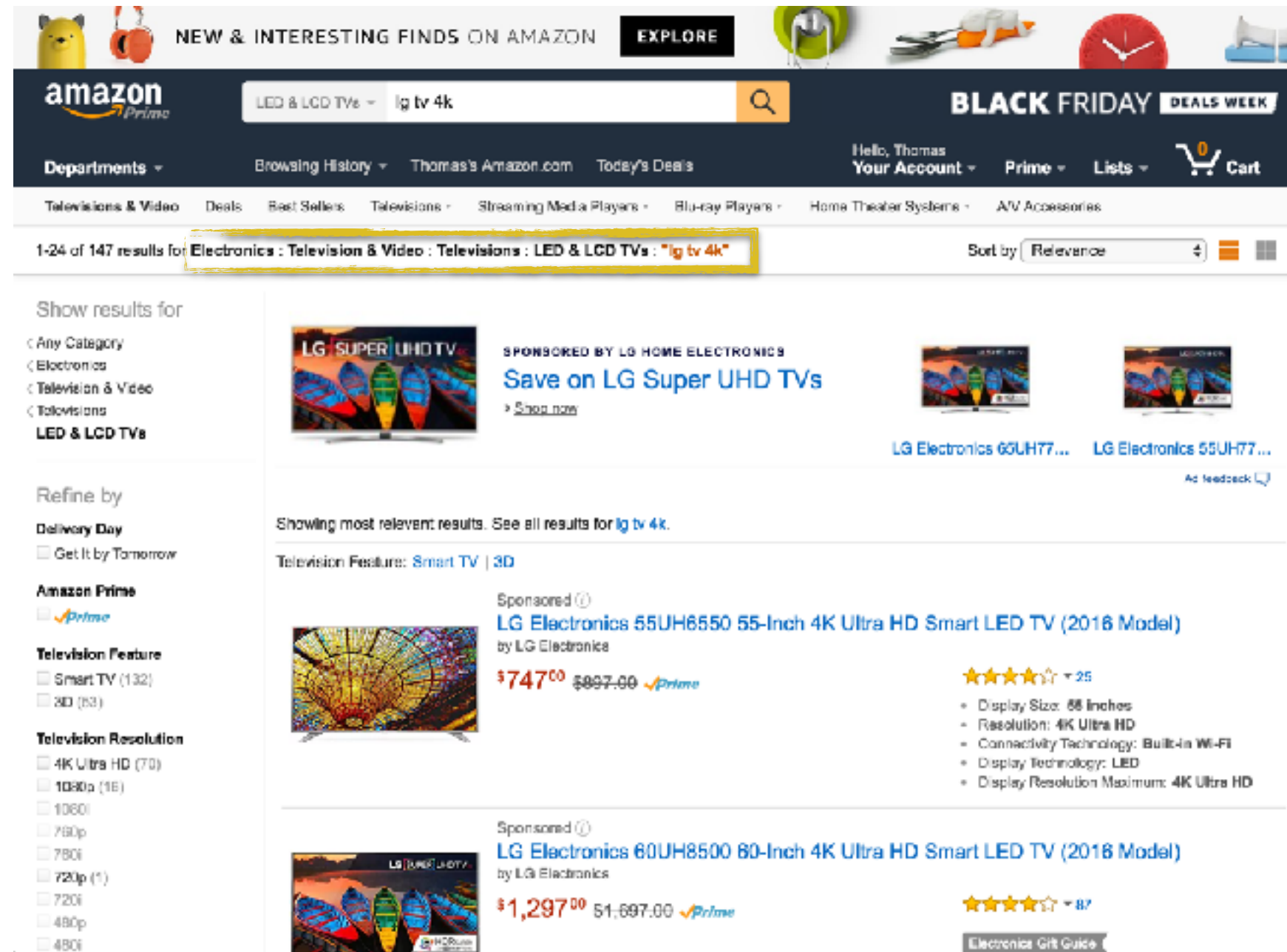
Utilities
Sections

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.

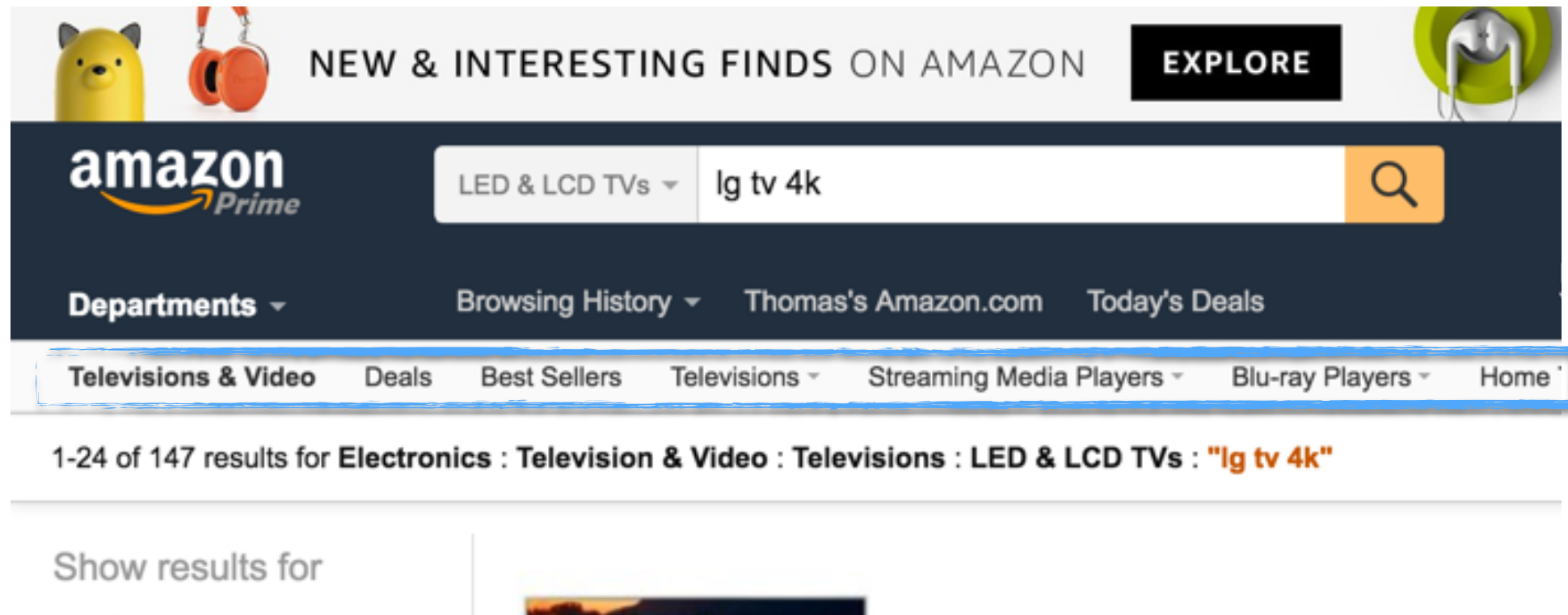
Breadcrumbs

- 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?