Administrative Stuff

Wednesday office hours: 9:30am-10:45am or by appointment

Final on Wed. 5/14 at 5:05-7:05pm, Ingraham 22

Interim presentation slides by Thursday night!

Next Tuesday: guest lecture

No office hours next Wednesday

No class next Thursday/Friday

Non-Empirical Methods: Heuristic Evaluation

Irene Rae
Computer Sciences

CS-570 Introduction to Human-computer Interaction

Empirical user research = based on observation

Examples:

- Contextual inquiries
- Ethnographies
- Thinkalouds
- Diaries and cultural probes are observations by proxy

Heuristic Evaluation

Heuristics: rules of thumb

A **rational** or **logical** (non-empirical) expert review method where heuristics are used to find usability problems.

Small team of evaluators using **recognized usability principles**

What would you pick?

Nielsen's 10 Major Heuristics

1. Visibility of system status
2. Match between system and real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

More detailed heuristics in readings!

1. Visibility

"The system should **always keep users informed** about what is going on, through appropriate feedback within a reasonable time."

Both visibility of system status & use of feedback

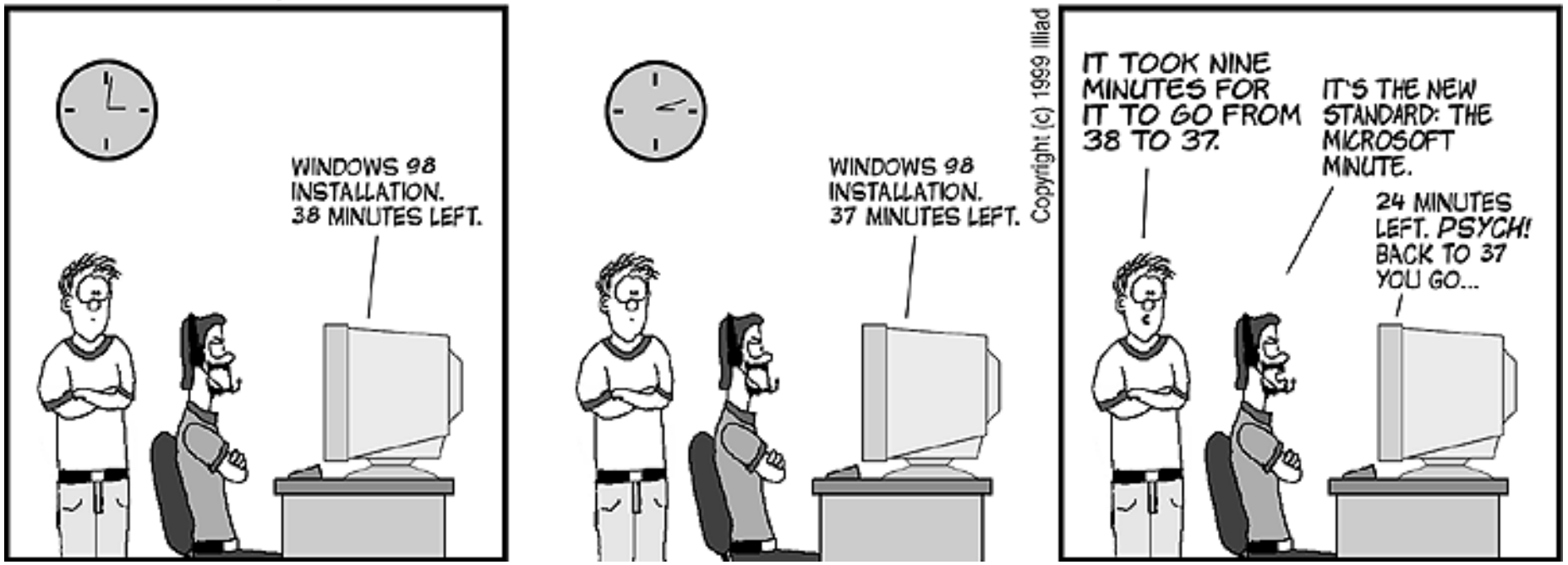
Any time the user wonders what state the system is in or the result of some action, this is a **visibility violation**

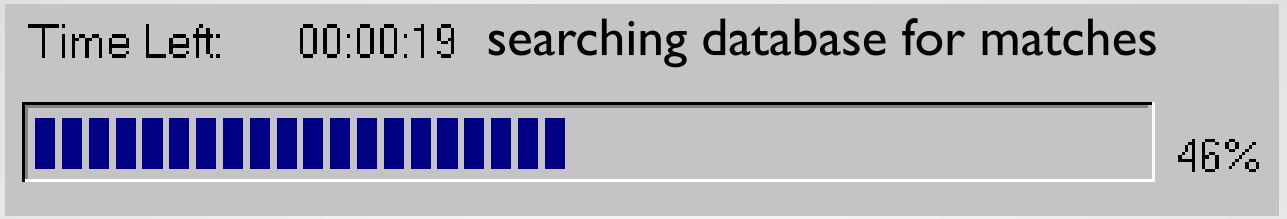
Visibility of **system status and feedback**

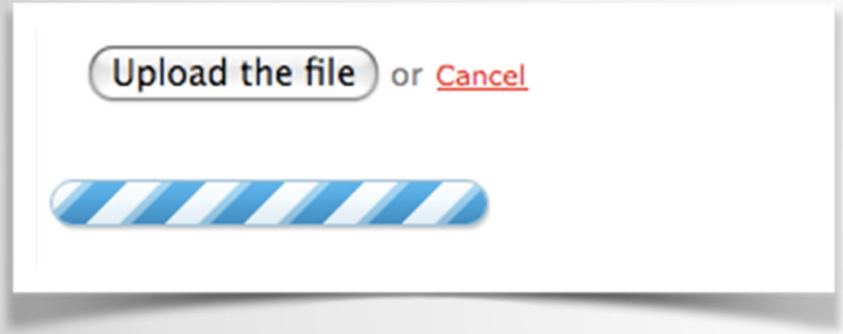
Feedback durations

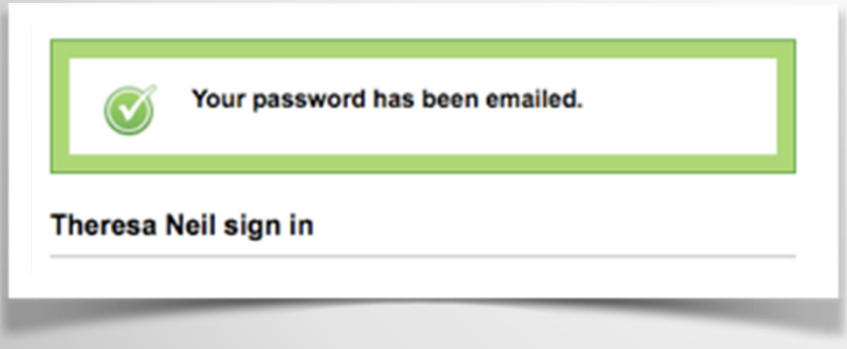
< 0.1 second	Limit for user feeling the system is **reacting instantaneously**
0.1 to 1.0 seconds	Limit for user's **flow of thought** to stay uninterrupted, **noticeable**
1.0 to 10.0 seconds	Limit for keeping user's **attention**, **requires user feedback**
> 10.0 seconds	Users will multi-task, **progress indicator required**

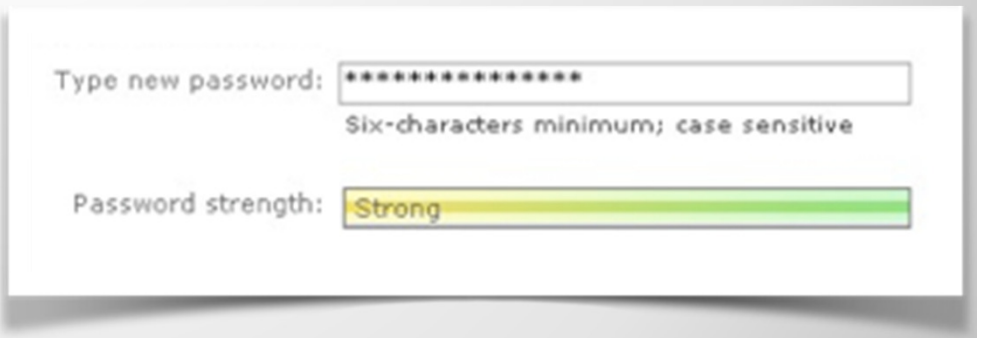
USER FRIENDLY by Illiad



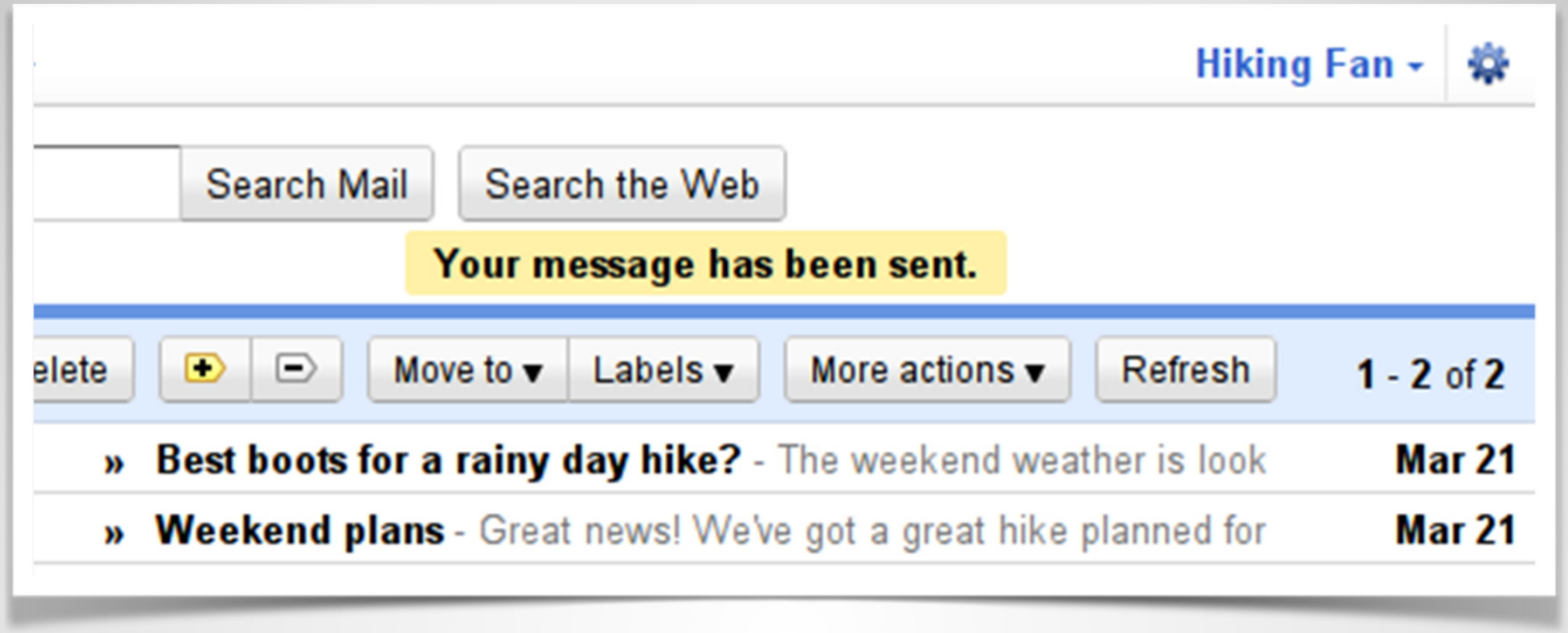


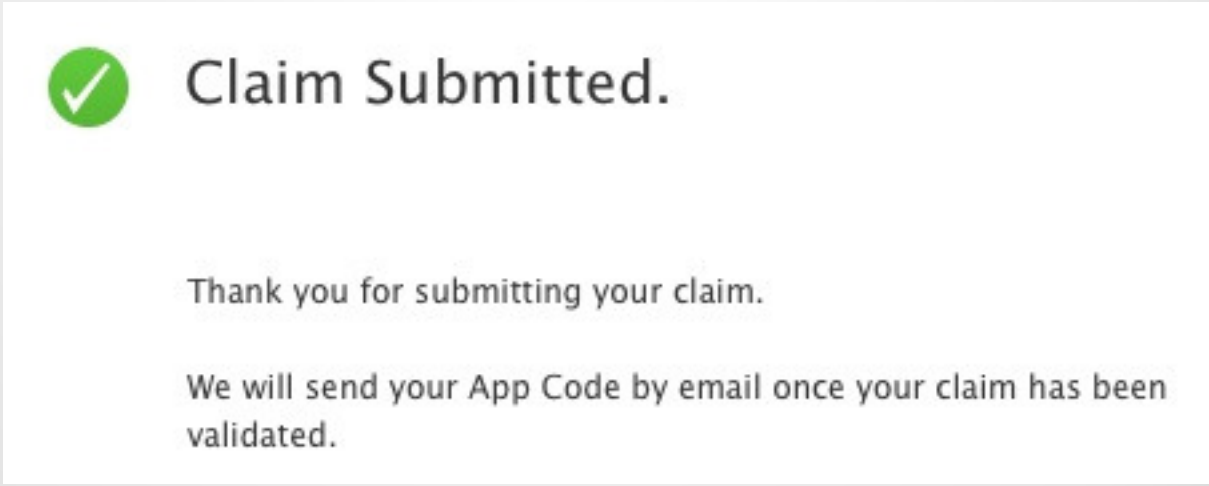




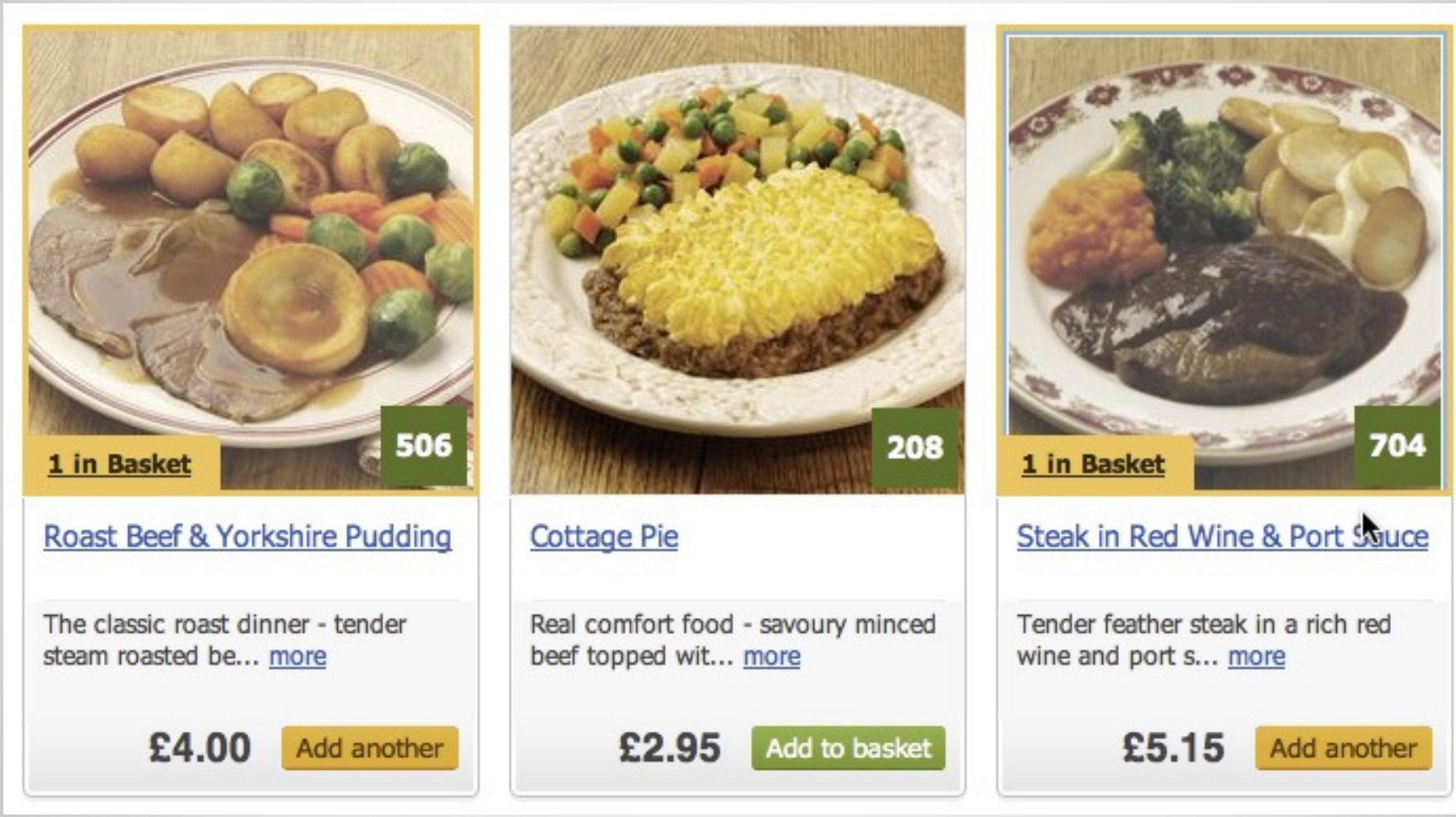


Examples by Theresa Neil


Hiking Fan
Search Mail
Search the Web
Your message has been sent.
elete
Move to ▾
Labels ▾
More actions ▾
Refresh
1 - 2 of 2
» Best boots for a rainy day hike? - The weekend weather is look
Mar 21
» Weekend plans - Great news! We've got a great hike planned for
Mar 21


Claim Submitted.
Thank you for submitting your claim.
We will send your App Code by email once your claim has been validated.

Positive Feedback



2. Real World Match

"The system should **speak the user's language**, with words, phrases, and concepts familiar to the user, rather than system-oriented terms. **Follow real-world conventions**, making information appear in a natural and logical order."

Refers to word and language choice, concpetual model, metaphors, mappings, and sequencing problems.

"PC load letter! What the **** does that mean?!"

– Office Space

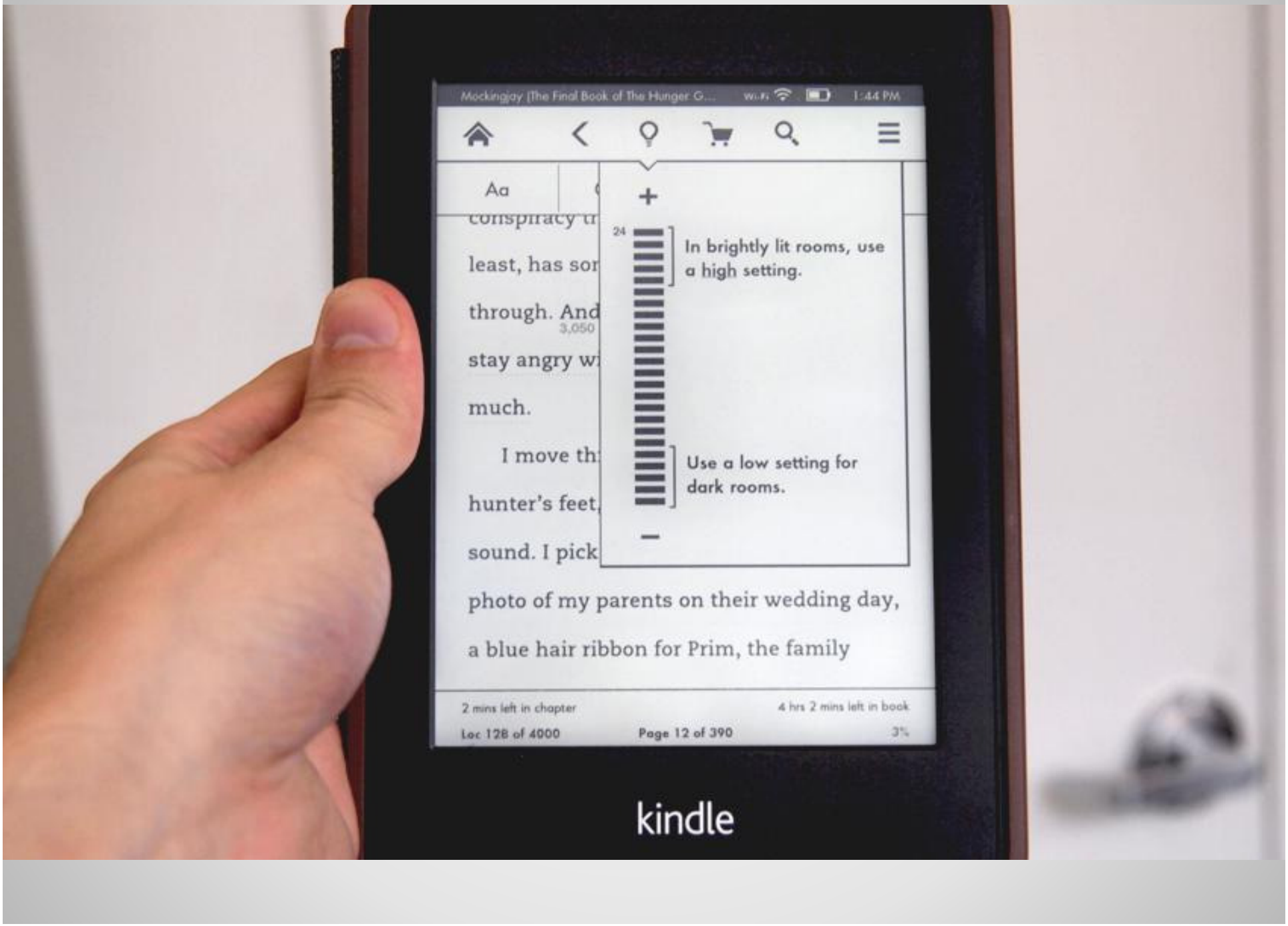
Plastic Containers > Clear Plastic Display Boxes, Clear Plastic Boxes, Clear Display Cases

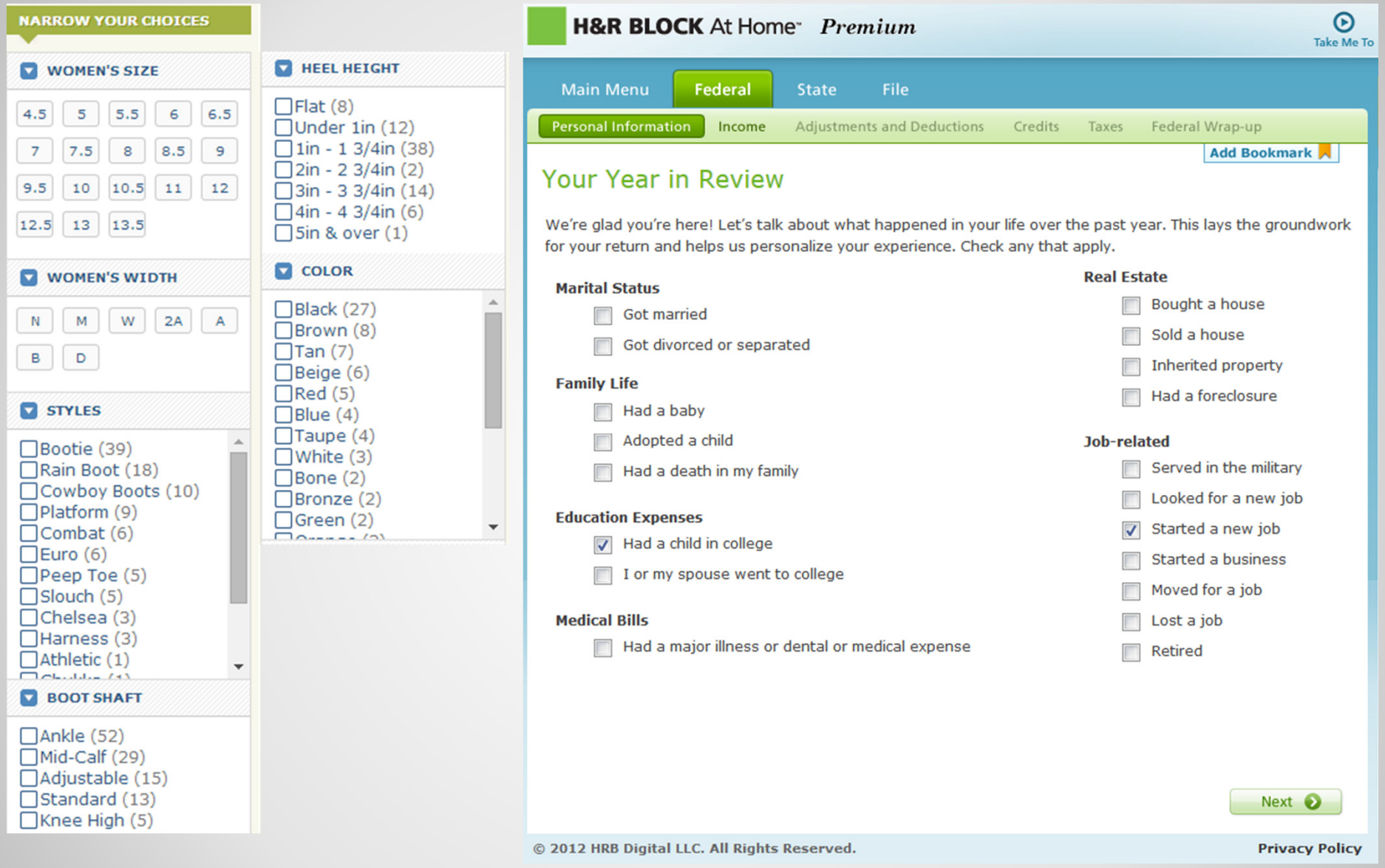
Clear Plastic Display Boxes, Clear Plastic Boxes, Clear Display Cases

- SELECT ONE -
- SELECT ONE -
Clear Flat Top Box 751 (10 ct) - $12.00
Clear Flat Top Box 752 (10 ct) - $12.50
Clear Flat Top Box 754 (10 ct) - $14.50
Clear Flat Top Box 760 - $2.10
Clear Flat Top Box 762 - $2.45
Clear Flat Top Box 763 - $4.00
Clear Flat Top Box 764 - $3.65
Clear Flat Top Box 765 - $5.00
Clear Flat Top Box 772 - $4.00
Clear Flat Top Box 773 - $4.40
Clear Flat Top Box 774 - $4.75

1

Totem Pole


Mockingjay (The Final Book of the Hunger G...
1:44 PM
Aa
24
In brightly lit rooms, use a high setting.
Use a low setting for dark rooms.
least, has sor
through. And
3,050
stay angry w
much.
I move th
hunter's feet,
sound. I pick
photo of my parents on their wedding day,
a blue hair ribbon for Prim, the family
2 mins left in chapter
4 hrs 2 mins left in book
Loc 128 of 4000
Page 12 of 390
3%
kindle


NARROW YOUR CHOICES
WOMEN'S SIZE
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7 7.5 8 8.5 9
9.5 10 10.5 11 12
12.5 13 13.5
WOMEN'S WIDTH
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B D
STYLES
Bootie (39)
Rain Boot (18)
Cowboy Boots (10)
Platform (9)
Combat (6)
Euro (6)
Peep Toe (5)
Slouch (5)
Chelsea (3)
Harness (3)
Athletic (1)
BOOT SHAFT
Ankle (52)
Mid-Calf (29)
Adjustable (15)
Standard (13)
Knee High (5)
HEEL HEIGHT
Flat (8)
Under 1in (12)
1in - 1 3/4in (38)
2in - 2 3/4in (2)
3in - 3 3/4in (14)
4in - 4 3/4in (6)
5in & over (1)
COLOR
Black (27)
Brown (8)
Tan (7)
Beige (6)
Red (5)
Blue (4)
Taupe (4)
White (3)
Bone (2)
Bronze (2)
Green (2)
H&R BLOCK At Home Premium
Take Me To
Main Menu
Federal
State
File
Personal Information
Income
Adjustments and Deductions
Credits
Taxes
Federal Wrap-up
Add Bookmark
Your Year in Review
We're glad you're here! Let's talk about what happened in your life over the past year. This lays the groundwork for your return and helps us personalize your experience. Check any that apply.
Marital Status
Got married
Got divorced or separated
Family Life
Had a baby
Adopted a child
Had a death in my family
Education Expenses
Had a child in college
I or my spouse went to college
Medical Bills
Had a major illness or dental or medical expense
Real Estate
Bought a house
Sold a house
Inherited property
Had a foreclosure
Job-related
Served in the military
Looked for a new job
Started a new job
Started a business
Moved for a job
Lost a job
Retired
Next
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3. User in Control

"Users often choose system functions by mistake and will need a clearly marked 'emergency exit' to leave the unwanted state without having to go through an extended dialogue. Support **undo** and **redo**."

Not just for navigation exits, but for getting out of any situation or state.

skype

available

recent 2

Pete Bergman
Check out these photos I took...
just now

Maxine Richardson
Going out for an hour or so
10:15

Nina Kovac, Pete Bergman,...
Travel safely
09:26

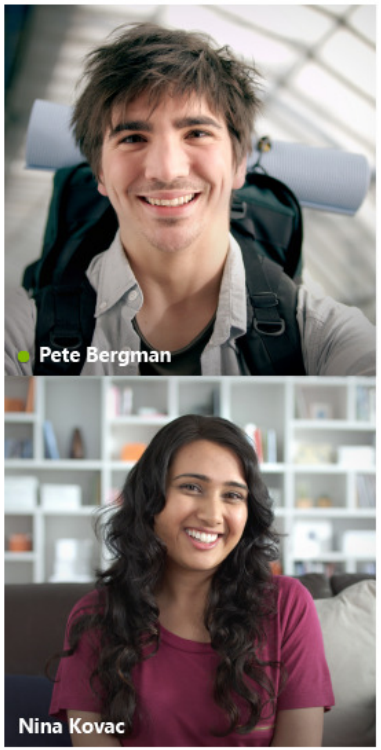
Bryan Haynes
I'll send you the link, it's hilarious
12:45

Erika Sullivan
09:12

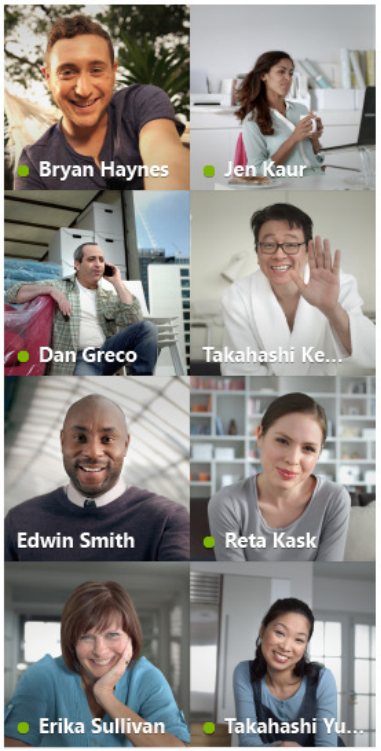
Edwin Smith
Should be arriving at 2pm
10:25

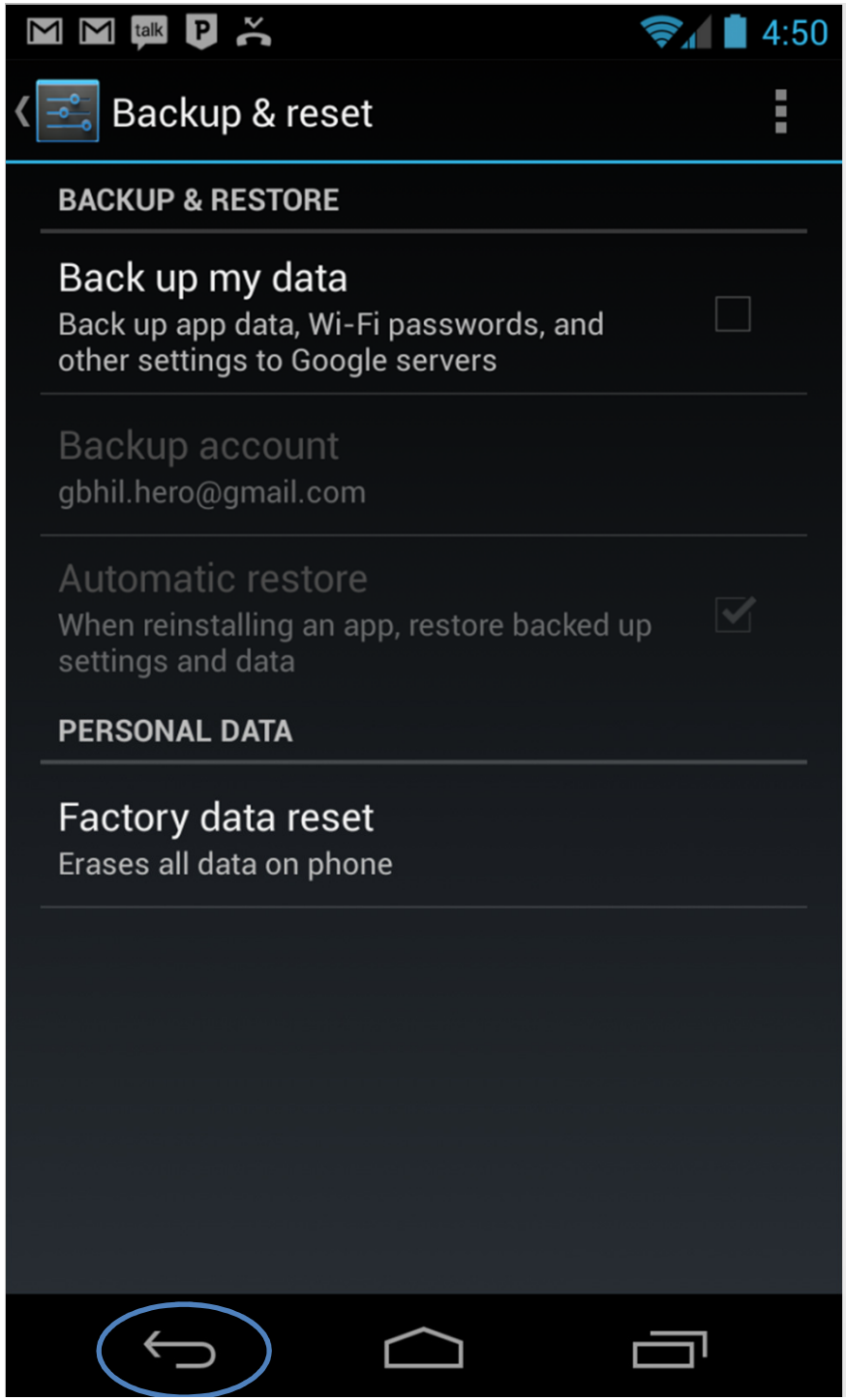
Takahashi Kenta
Brilliant.
8:34

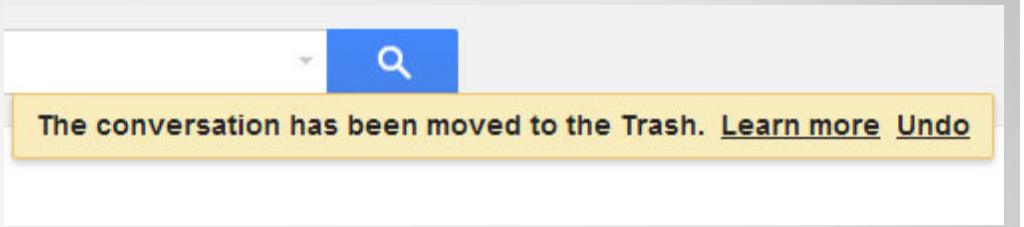
favorites

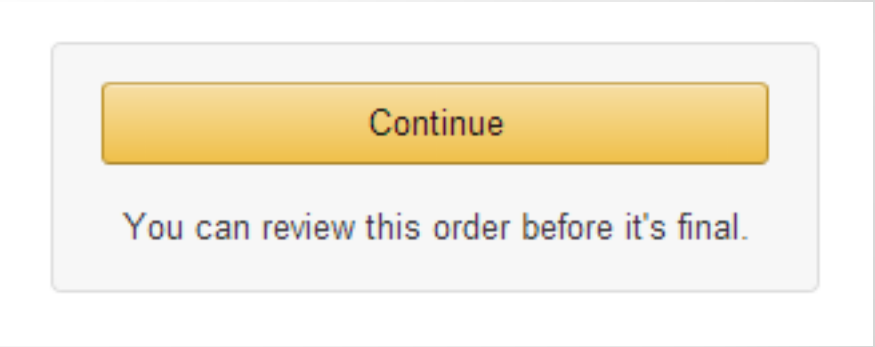


people




4:50
Backup & reset
BACKUP & RESTORE
Back up my data
Back up app data, Wi-Fi passwords, and other settings to Google servers
Backup account
gbhil.hero@gmail.com
Automatic restore
When reinstalling an app, restore backed up settings and data
PERSONAL DATA
Factory data reset
Erases all data on phone


The conversation has been moved to the Trash. Learn more Undo

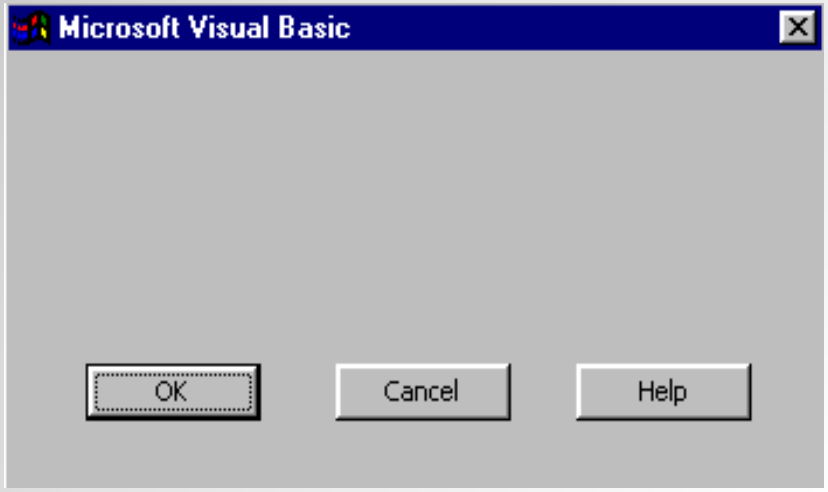

Continue
You can review this order before it's final.

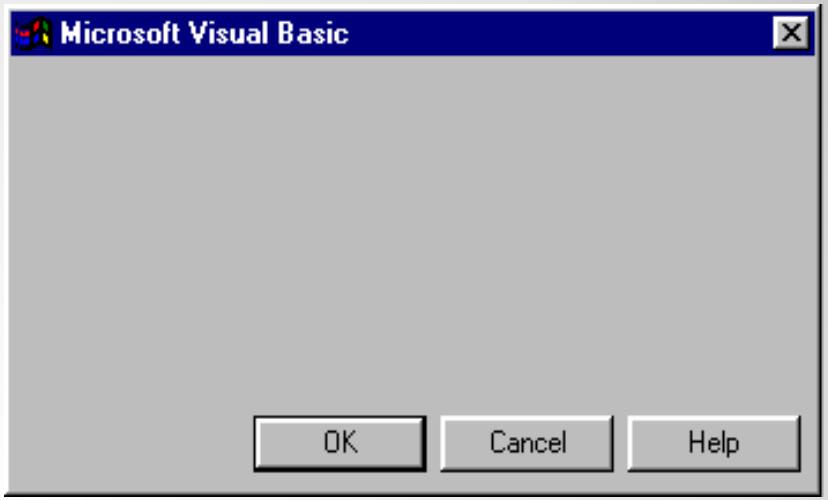
4. Consistency

"Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions."

Internal consistency is consistency throughout the same product.

External consistency is consistency with other products in its class.


Microsoft Visual Basic
OK
Cancel
Help


Microsoft Visual Basic
OK
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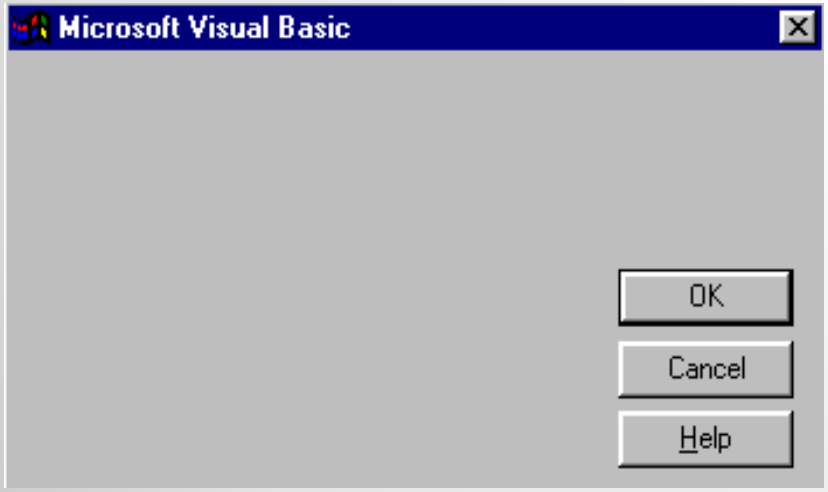
Microsoft Visual Basic
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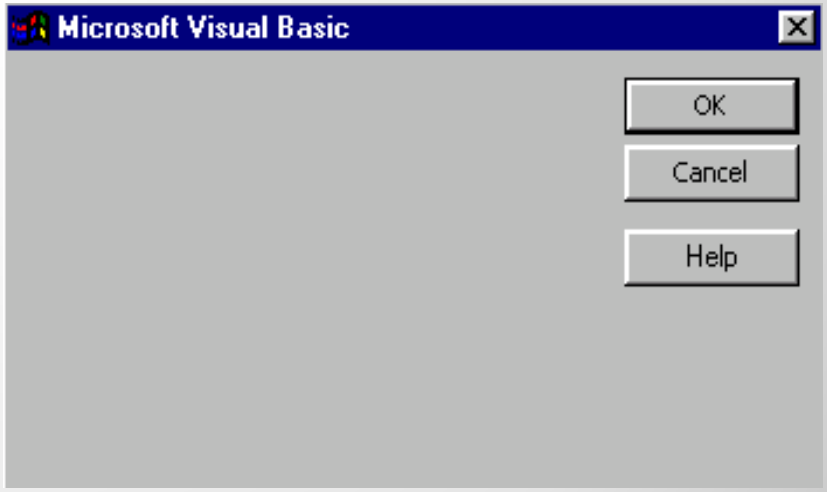
Microsoft Visual Basic
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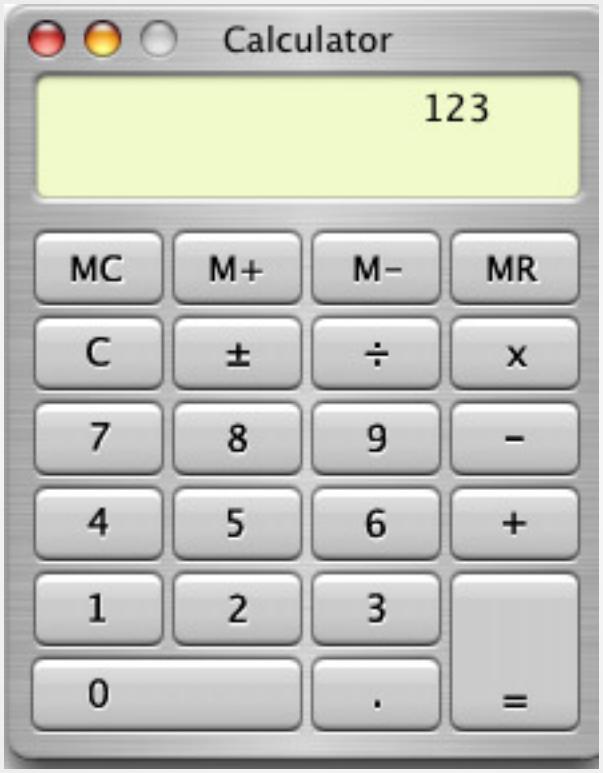
Calculator
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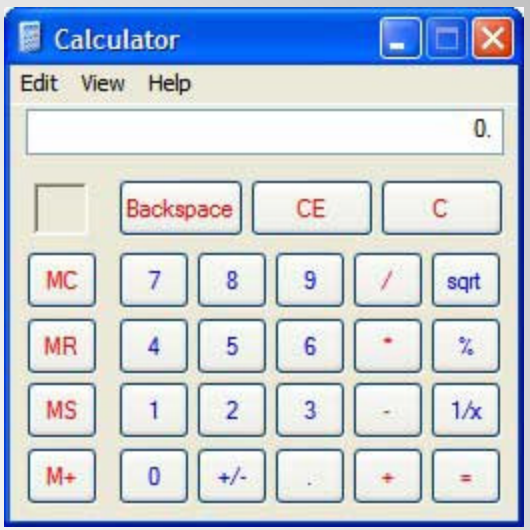
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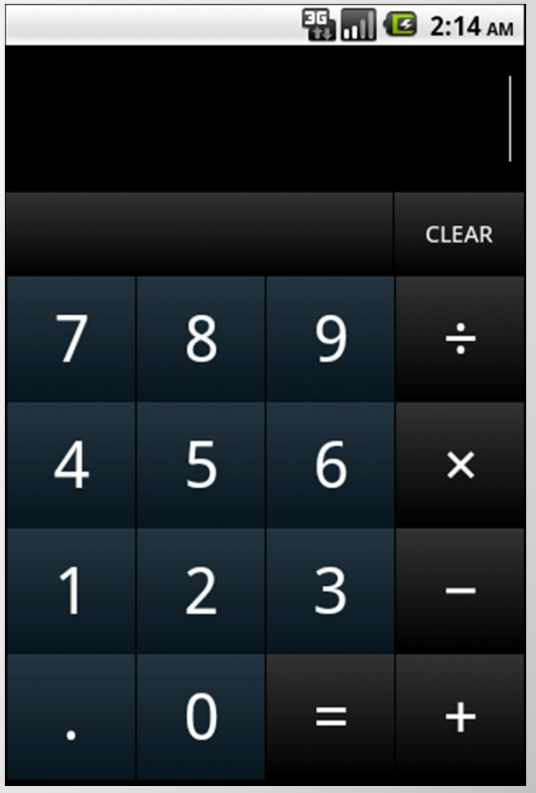
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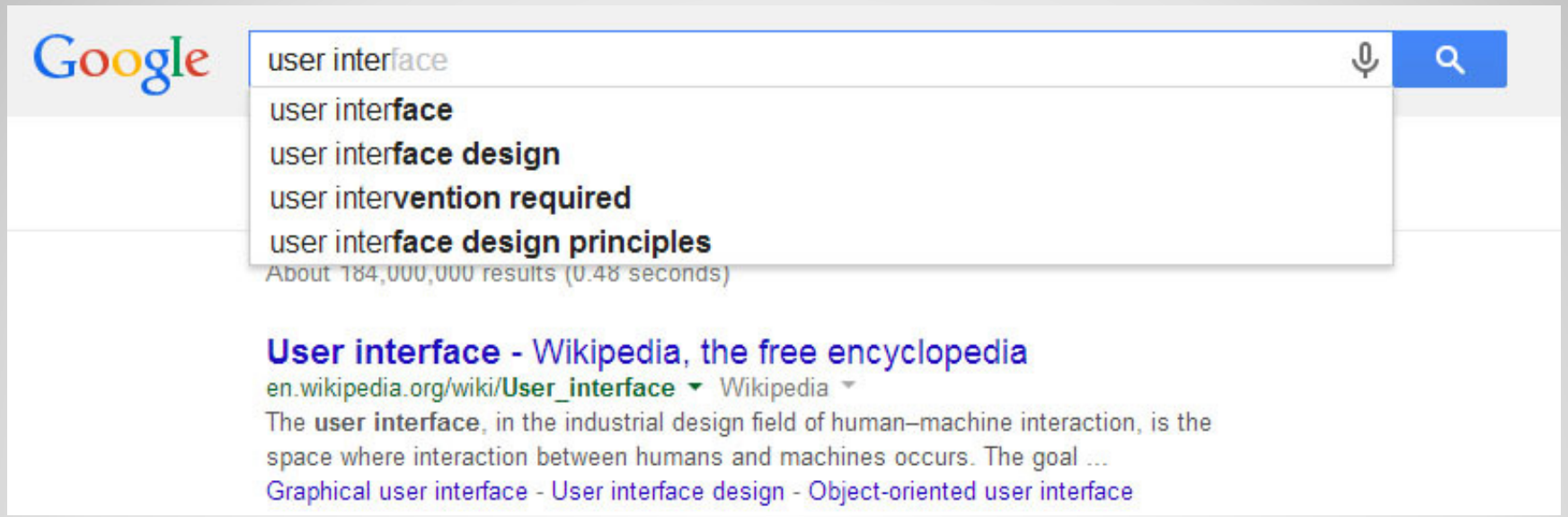
5. Error Prevention

"Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either **eliminate error-prone conditions or check for them and present users with a confirmation option** before they commit to action."

Try to commit errors and see how they are handled. Could they have been prevented?

Address errors **before they occur**


Google
user interface
user interface
user interface design
user intervention required
user interface design principles
About 184,000,000 results (0.48 seconds)
User interface - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/User_interface Wikipedia
The user interface, in the industrial design field of human–machine interaction, is the space where interaction between humans and machines occurs. The goal ...
Graphical user interface - User interface design - Object-oriented user interface

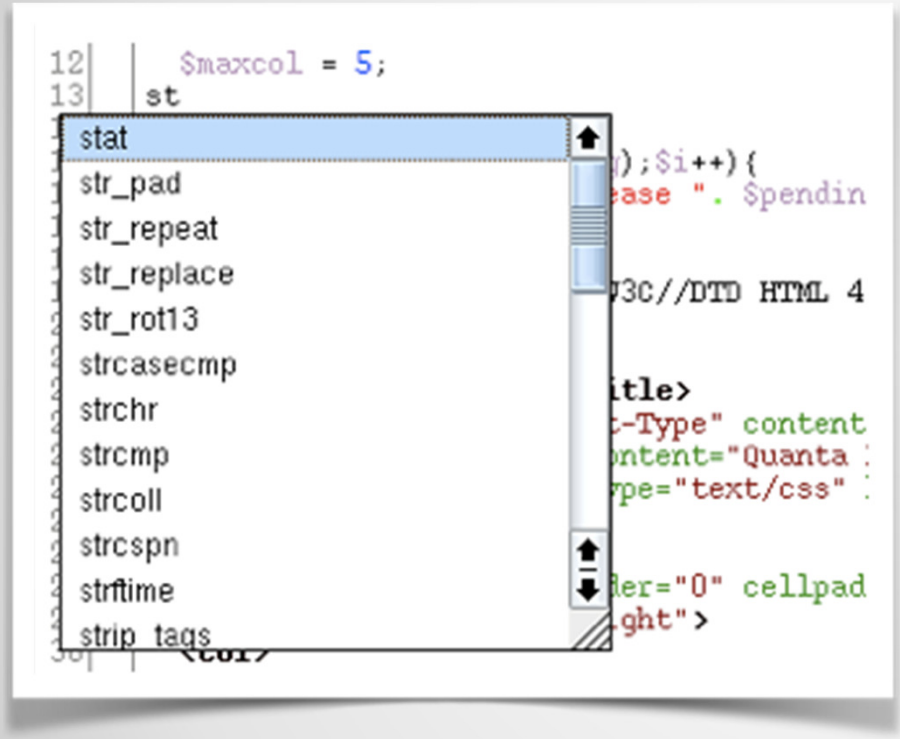
WARNING!
Resetting your phone will erase all your personal content, including apps that you have purchased and downloaded, and will restore the factory settings. Do you want to continue?
yes
no

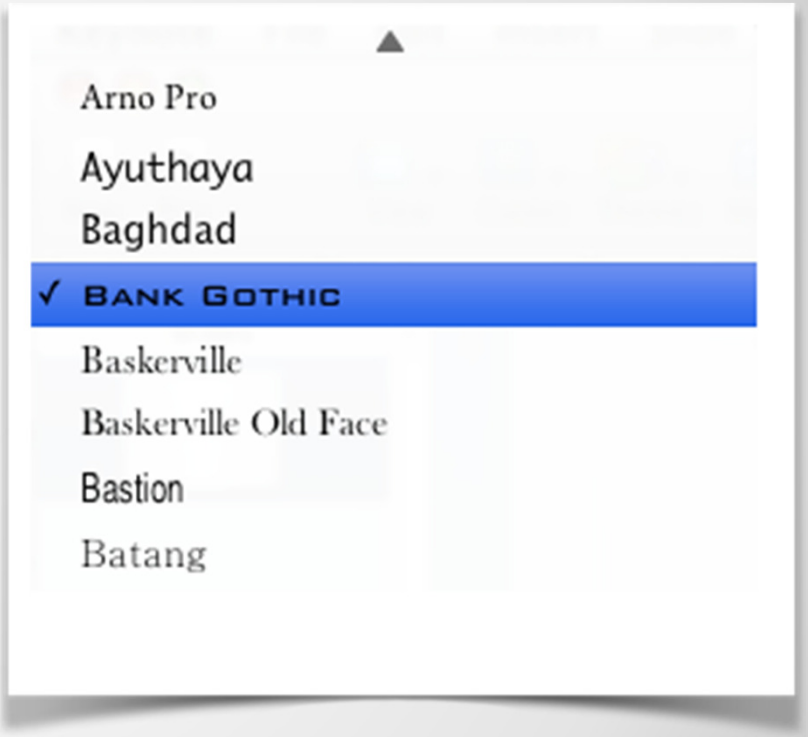
6. Recognition Not Recall

"**Minimize the user's memory load** by making objects, actions, and options visible."

The user should never carry a memory load

Visibility of **features and information**


12 $maxcol = 5;
13 st
stat
str_pad
str_repeat
str_replace
str_rot13
strcasecmp
strchr
strcmp
strcoll
strcspn
strftime
strip_tags


Arno Pro
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Baghdad
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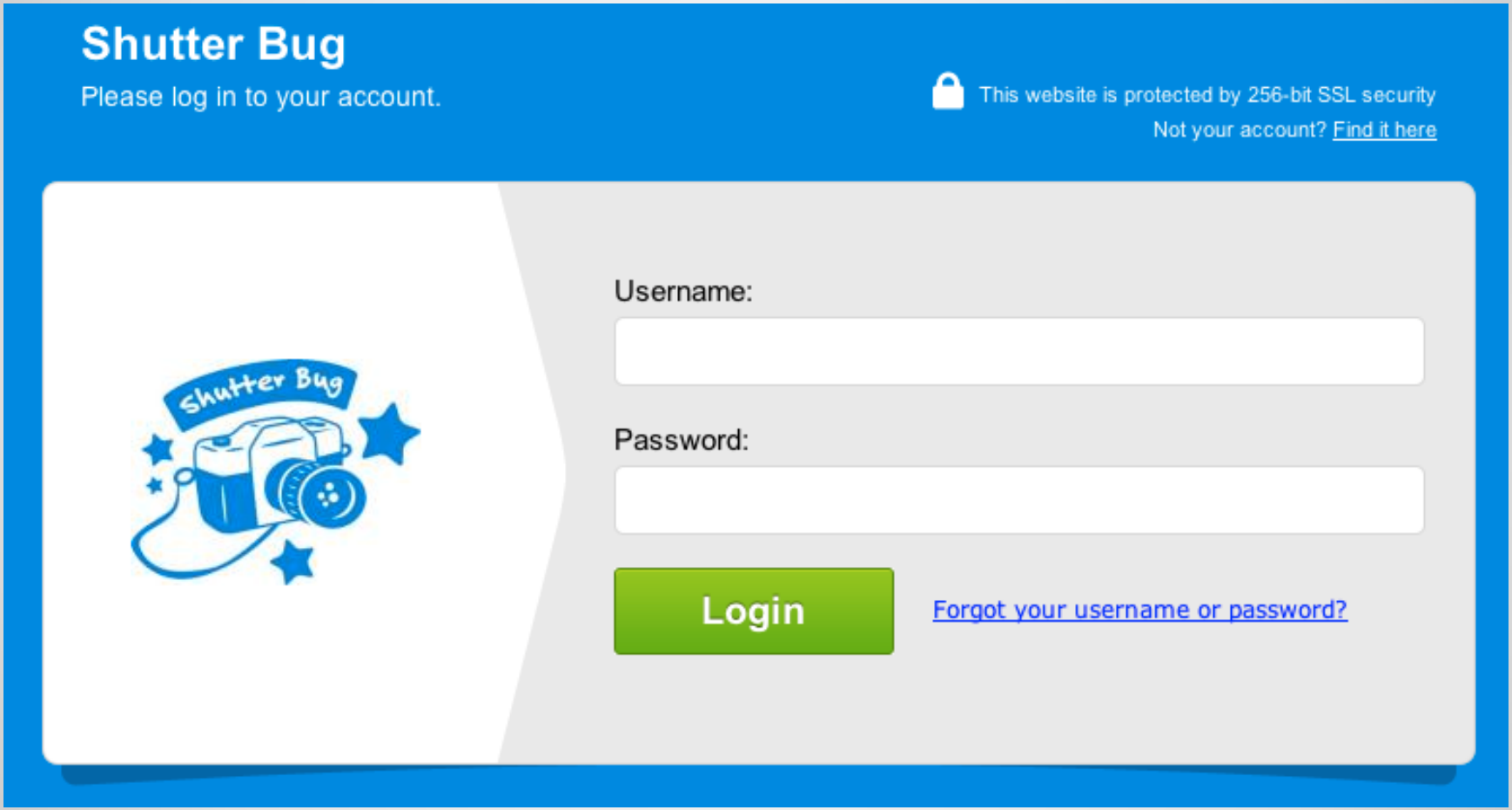
Baskerville
Baskerville Old Face
Bastion
Batang

Are there exceptions to this?

Passwords

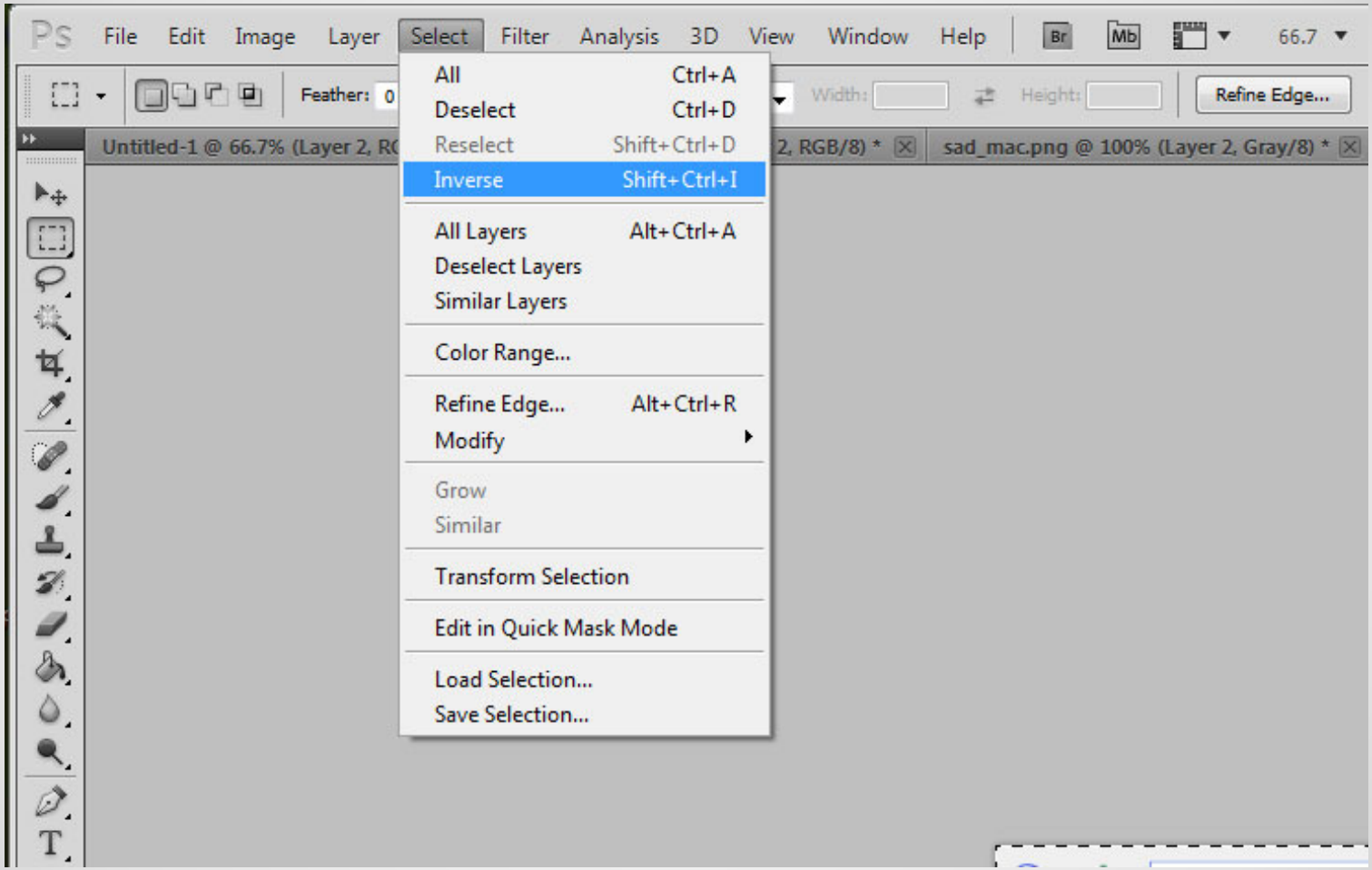

Shutter Bug
Please log in to your account.
This website is protected by 256-bit SSL security
Not your account? Find it here
Shutter Bug
Username:
Password:
Login
Forgot your username or password?

7. Flexibility and Efficiency

"Accelerators–unseen by the novice user–may often speed up the interaction for the expert user such that the system can **cater to both inexperienced and experienced users**."

Allow users to tailor frequent actions

Allow multiple ways of doing things


File
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Select
Filter
Analysis
3D
View
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Help
66.7
Feather: 0
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Height:
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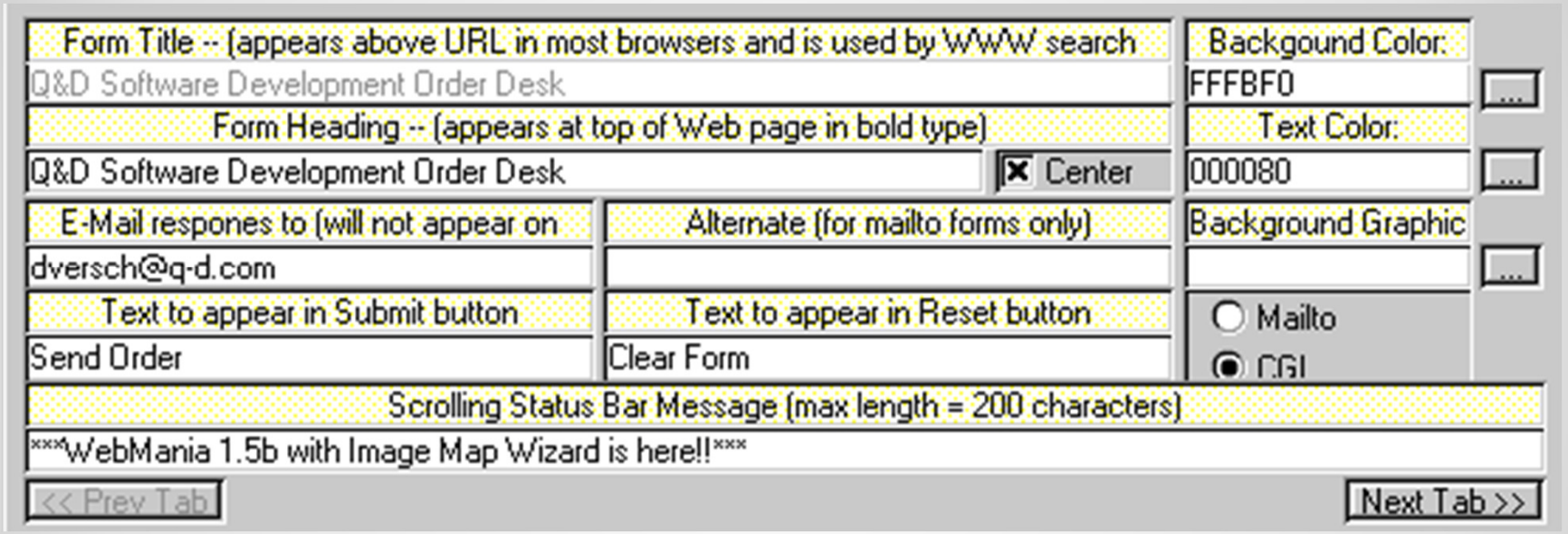
Untitled-1 @ 66.7% (Layer 2, RG
2, RGB/8) *
sad_mac.png @ 100% (Layer 2, Gray/8) *
All Ctrl+A
Deselect Ctrl+D
Reselect Shift+Ctrl+D
Inverse Shift+Ctrl+I
All Layers Alt+Ctrl+A
Deselect Layers
Similar Layers
Color Range...
Refine Edge... Alt+Ctrl+R
Modify
Grow
Similar
Transform Selection
Edit in Quick Mask Mode
Load Selection...
Save Selection...

You can take a closer look at some items. Click on the gate buzzer
skip tutorial
Menu
INVENTORY
Hint

8. Aesthetic Design

"Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility."

Not just about "ugliness" but about clutter, overload of the visual field, visual noise, distracting animations, etc.


Form Title -- (appears above URL in most browsers and is used by WWW search
Q&D Software Development Order Desk
Backgound Color:
FFFBF0
...
Form Heading -- (appears at top of Web page in bold type)
Q&D Software Development Order Desk
Center
Text Color:
000080
...
E-Mail respones to (will not appear on
dversch@q-d.com
Alternate (for mailto forms only)
Background Graphic
...
Text to appear in Submit button
Send Order
Text to appear in Reset button
Clear Form
Mailto
CGI
Scrolling Status Bar Message (max length = 200 characters)
WebMania 1.5b with Image Map Wizard is here!!
<< Prev Tab
Next Tab >>

Home Mail News Sports Finance Weather Games Groups Answers Screen Flickr Mobile More

YAHOO!

Search

My Yahoo Hi, Mail

- Mail
- Autos
- News
- Sports
- Finance
- Weather
- Games
- Homes
- Food
- Tech
- Answers
- Screen
- Flickr
- Jobs
- Shopping
- Travel
- Dating

More Yahoo Sites ›

Get the Yahoo mobile app

Make YAHOO!

6 reasons why your workout isn't working

You can hit the gym every day and still not get results, due to these common, and costly, mistakes.

Avoid an empty stomach »

1 – 5 of 70

6 workout mistakes | Car fire in lion park | High-paying careers | Shark in pickup truck | Netflix to raise prices

All Stories News Local Entertainment Sports More

Expectant Parents Asked the Internet to Name Their Child. And the Winning Name Is...

In January of this year, an expectant father named Stephen started the website NameMyDaughter.com, where anyone on the Internet could suggest and vote on

Yahoo Tech

Woman accused in babies' deaths appears in court

PROVO, Utah (AP) — Prosecutors have been granted more time to determine what charges to file against a Utah woman accused of killing six of her babies and storing their bodies in her garage.

Associated Press

Prince George Squeals With Delight, Meeting His Bilby Namesake With Parents Kate Middleton, Prince William: Pictures

Kate Middleton and Prince William took their son Prince George to the Taronga Zoo

Trending Now

1 Macaulay Culkin
2 Melissa Gorga
3 Starved inmate
4 Real Housewives of At...
5 Courthouse shooting
6 Neil Patrick Harris
7 Antiaging creams
8 Mila Kunis
9 Oscar Mayer recall
10 Heaven Is for Real m...

Today's Headlines

1 First since 1983: American man wins Boston Marathon
2 U.S. weighs curbing deportations
3 Biden offers Ukraine U.S. help on energy, aid allocation
4 U.S. must disclose version of drone memo: court
41 minutes ago
5 U.S. looking into possible chemical attack in Syria

Madison

68°F Cloudy

Today	Tomorrow	Wednesday
67° 38°	57° 32°	56° 40°

Quotes Yahoo Finance

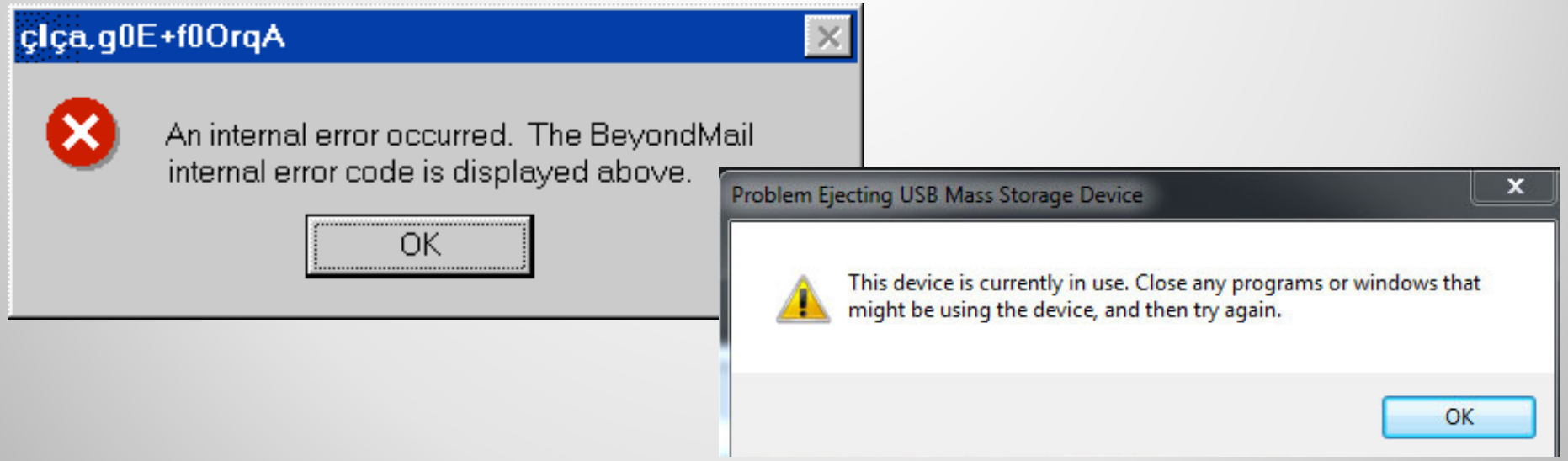
S&P 500	1,871.89	↑	0.38%
NASDAQ Composite	4,121.55	↑	0.64%
Dow Jones Indust...	16,449.25	↑	0.25%

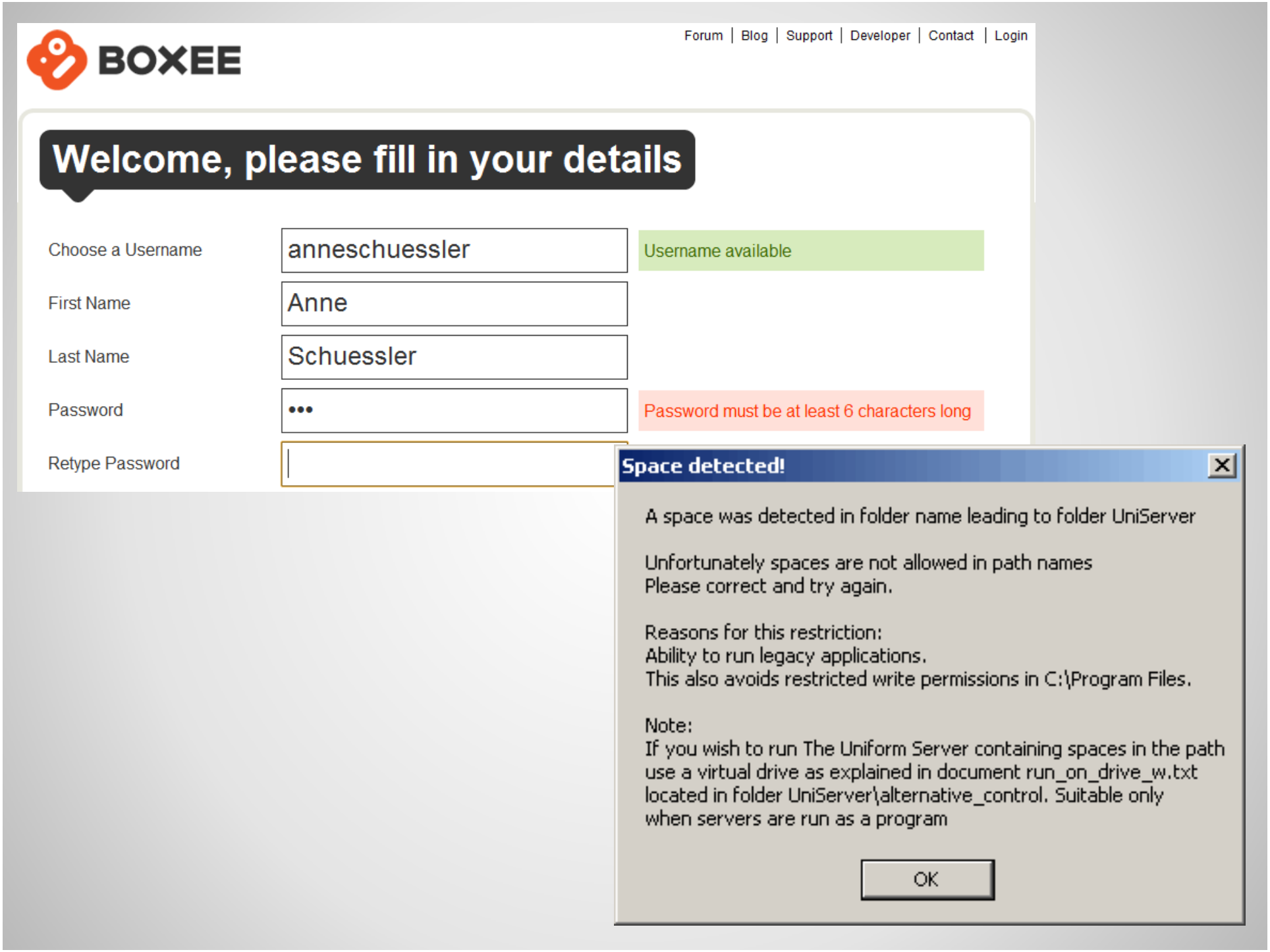
EXIT
The Soldier
Welcome to the Soldier weapons course!
Press Spacebar to continue
200
4 20

9. Error Recovery

"Error messages should be expressed **in plain language** (no codes), **precisely indicate the problem**, and **constructively suggest a solution**."

How to address errors **after they occur**



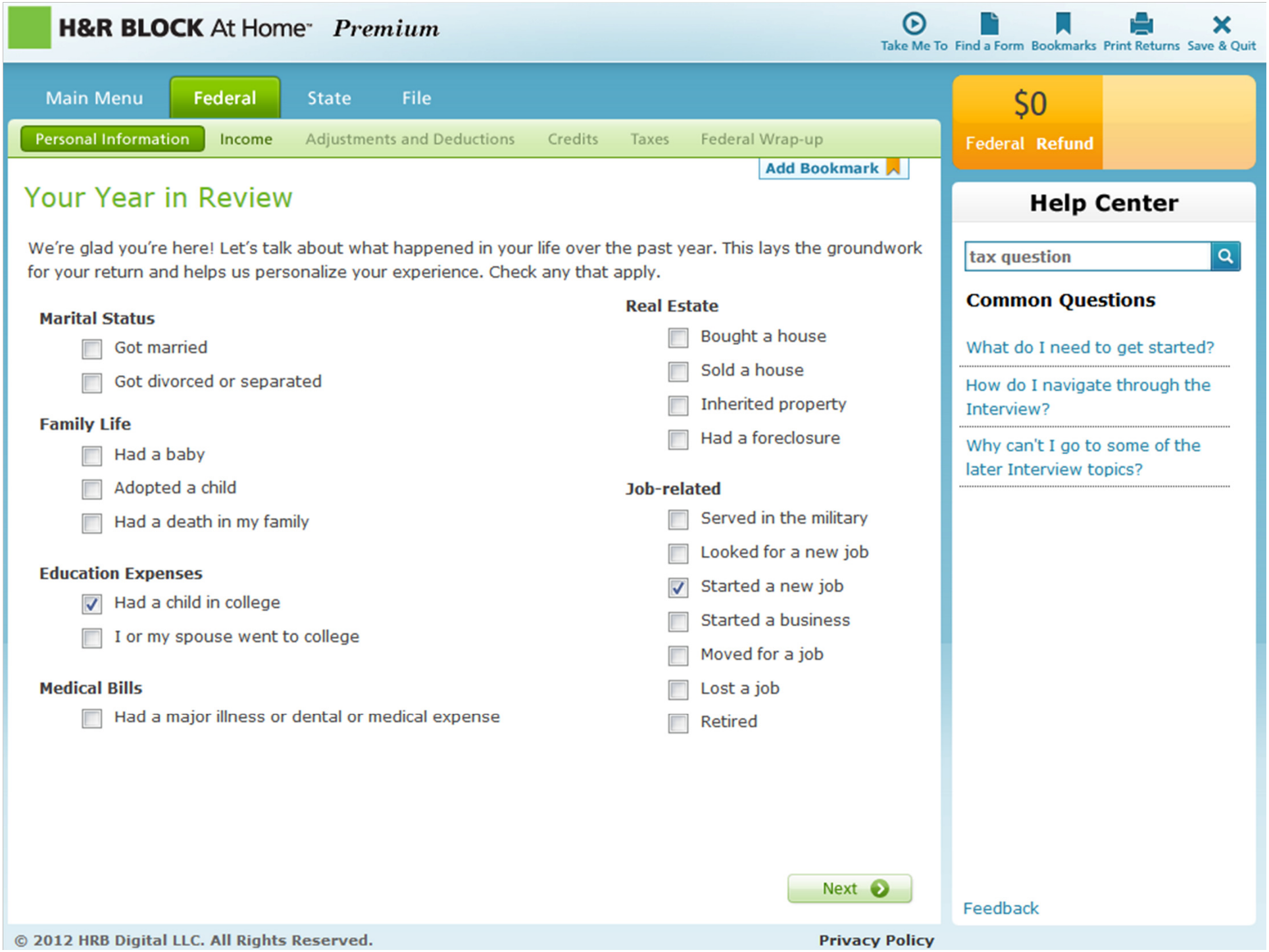

BOXEE
Forum | Blog | Support | Developer | Contact | Login
Welcome, please fill in your details
Choose a Username
anneschuessler
Username available
First Name
Anne
Last Name
Schuessler
Password
Password must be at least 6 characters long
Retype Password
Space detected!
A space was detected in folder name leading to folder UniServer
Unfortunately spaces are not allowed in path names
Please correct and try again.
Reasons for this restriction:
Ability to run legacy applications.
This also avoids restricted write permissions in C:\Program Files.
Note:
If you wish to run The Uniform Server containing spaces in the path use a virtual drive as explained in document run_on_drive_w.txt located in folder UniServer\alternative_control. Suitable only when servers are run as a program
OK

10. Help and Documentation

Although it is better if the system can be used without documentation, it may be necessary to **provide help and documentation**.

Should be easy to search, focused on the user's task, list concrete steps to carry out, not too large.

Different than a "user manual"


H&R BLOCK At Home Premium
Take Me To
Find a Form
Bookmarks
Print Returns
Save & Quit
Main Menu
Federal
State
File
Personal Information
Income
Adjustments and Deductions
Credits
Taxes
Federal Wrap-up
$0
Federal Refund
Add Bookmark
Your Year in Review
We're glad you're here! Let's talk about what happened in your life over the past year. This lays the groundwork for your return and helps us personalize your experience. Check any that apply.
Marital Status
Got married
Got divorced or separated
Family Life
Had a baby
Adopted a child
Had a death in my family
Education Expenses
Had a child in college
I or my spouse went to college
Medical Bills
Had a major illness or dental or medical expense
Real Estate
Bought a house
Sold a house
Inherited property
Had a foreclosure
Job-related
Served in the military
Looked for a new job
Started a new job
Started a business
Moved for a job
Lost a job
Retired
Next
Help Center
tax question
Common Questions
What do I need to get started?
How do I navigate through the Interview?
Why can't I go to some of the later Interview topics?
Feedback
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Questions?

Conducting a Heuristic Evaluation

Heuristic Evaluation Process

Step 1: Individual Evaluation

- Each evaluator compares the design with known usability principles (heuristics)
- Each evaluator writes down all problems in a Usability Aspect Report (UAR)

Step 2: Group Process

- Group combines the problems & assigns severity ratings

Step 3: Write a report

Heuristic Evaluation vs. Usability Testing

Heuristic Evaluation

Inspection method

3-5 evaluators, 1 manager

Evaluators shouldn't be left without help

1-4 hours/session

Finds hardest-to-find problems, but may miss common problems

Usability Testing

Empirical method

5 users, 1 experimenter

Users left without help to struggle

0.5-1 hour/session

Finds most common problems, including conceptual model problems

Step 1: Individual Evaluation

Briefing (Method, Domain, Scenario)

Evaluation by each individual:

- Read all heuristics & descriptions, queue in mind
- Have cheat sheet of heuristics in front of you
- Inspect flow & each screen against heuristics
- Make a **general pass** to get a feel and not gross violations
- Make a **second detailed pass** focusing on things that caught your attention earlier

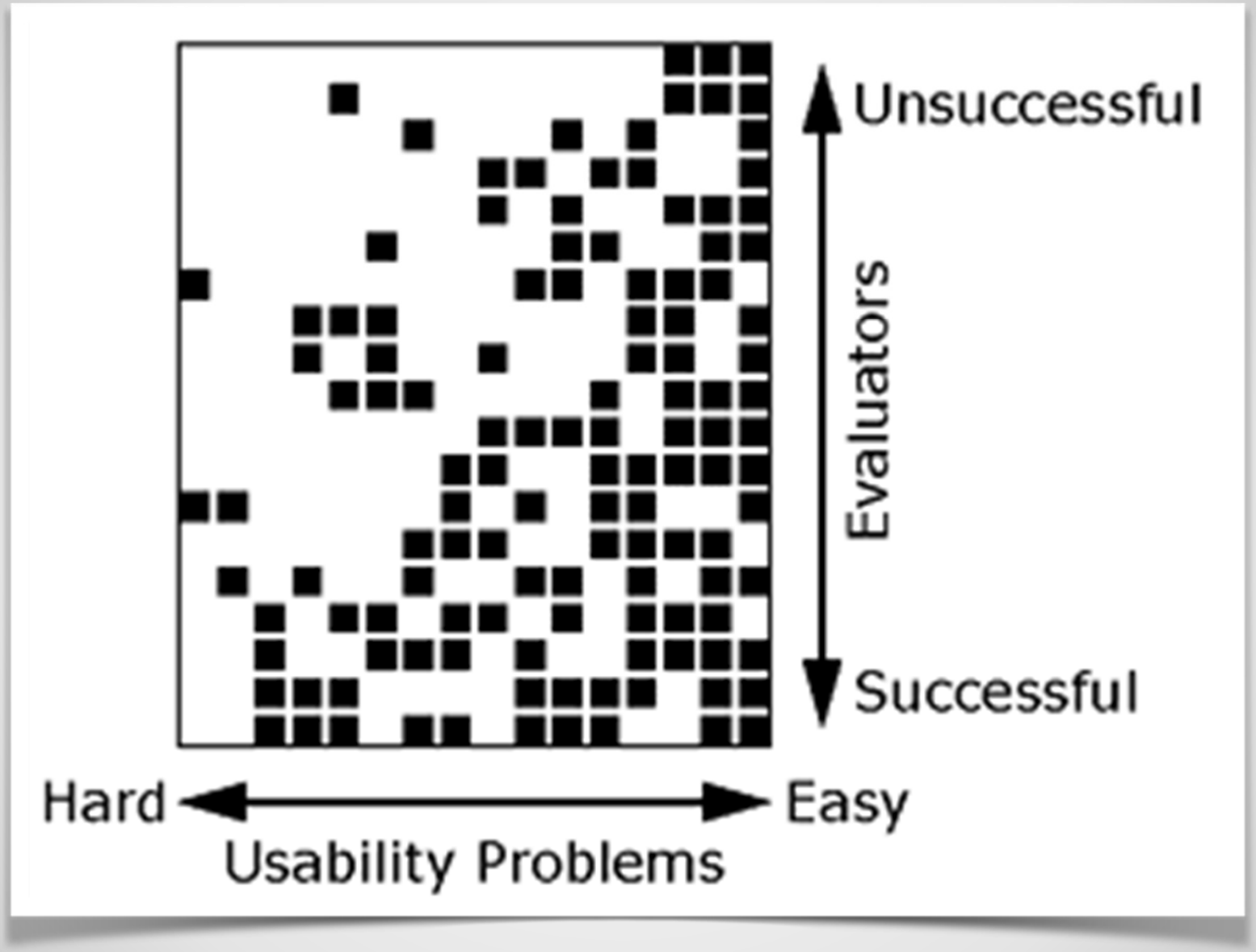
More Than One Evaluator!

Not a single-user empirical test

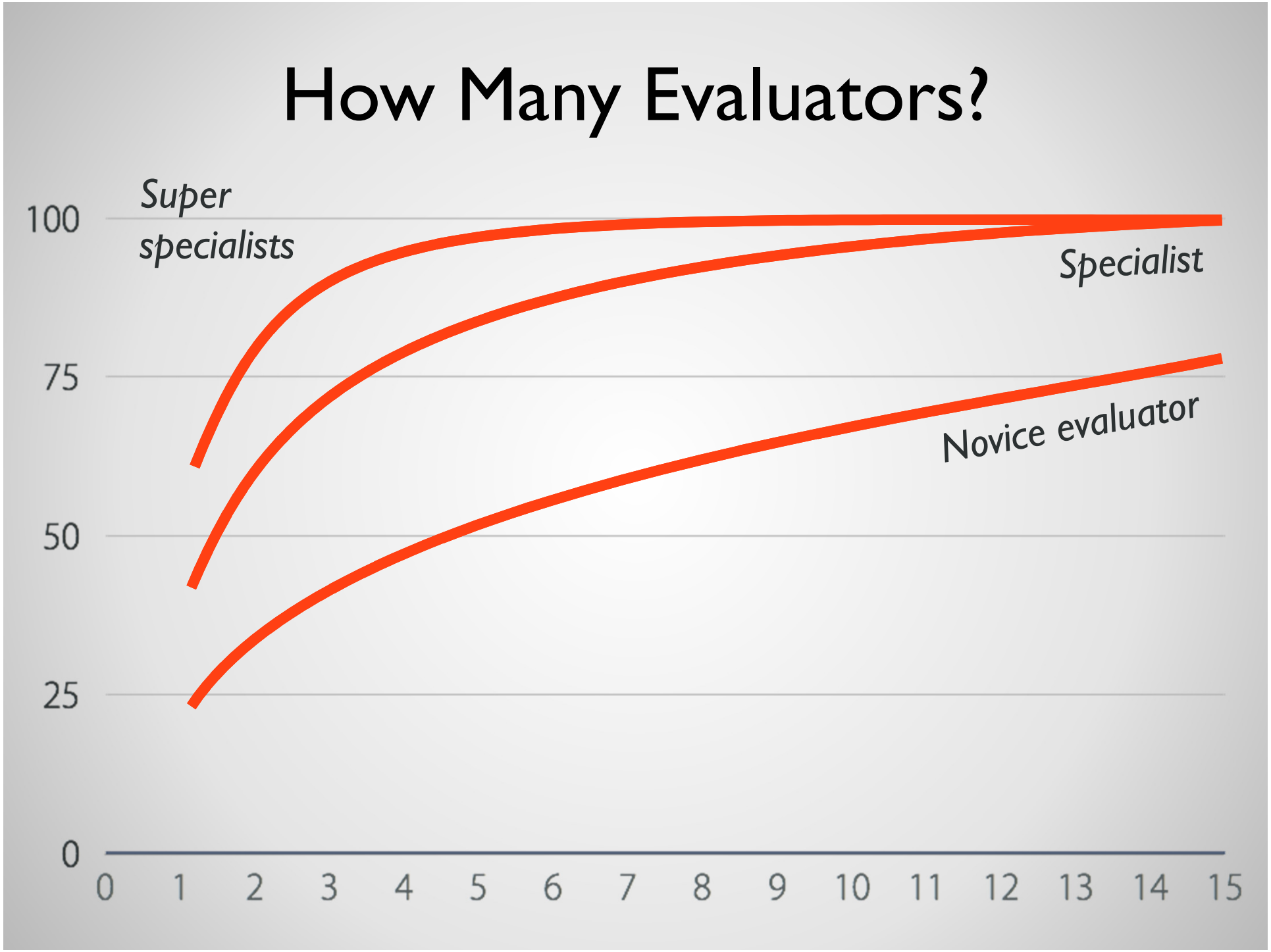
A single person won't find all usability problems

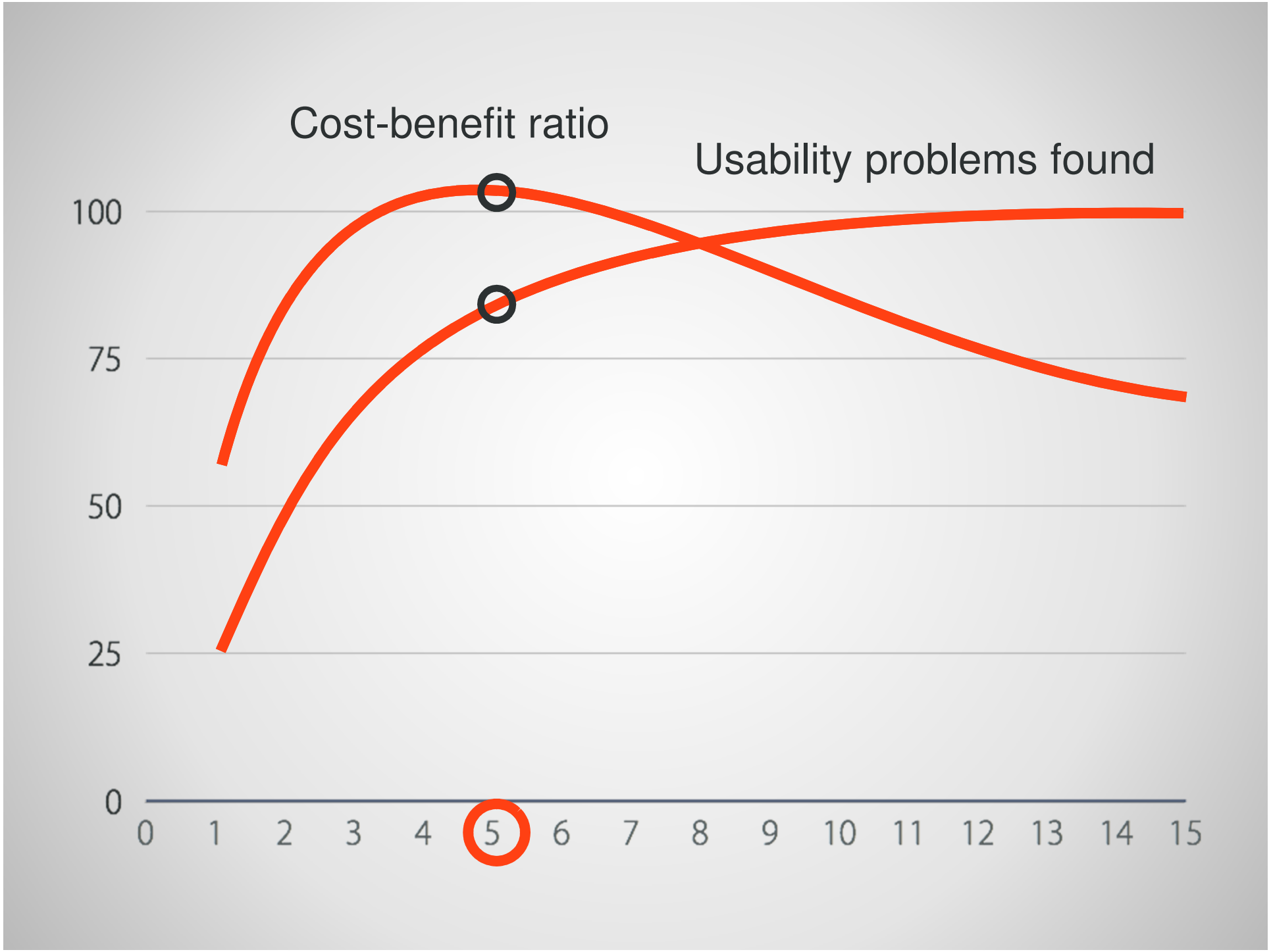
Different people find different problems

Successful evaluators may find easy and difficult problems


Unsuccessful
Evaluators
Successful
Hard
Easy
Usability Problems

How Many Evaluators?




Cost-benefit ratio
Usability problems found
100
75
50
25
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

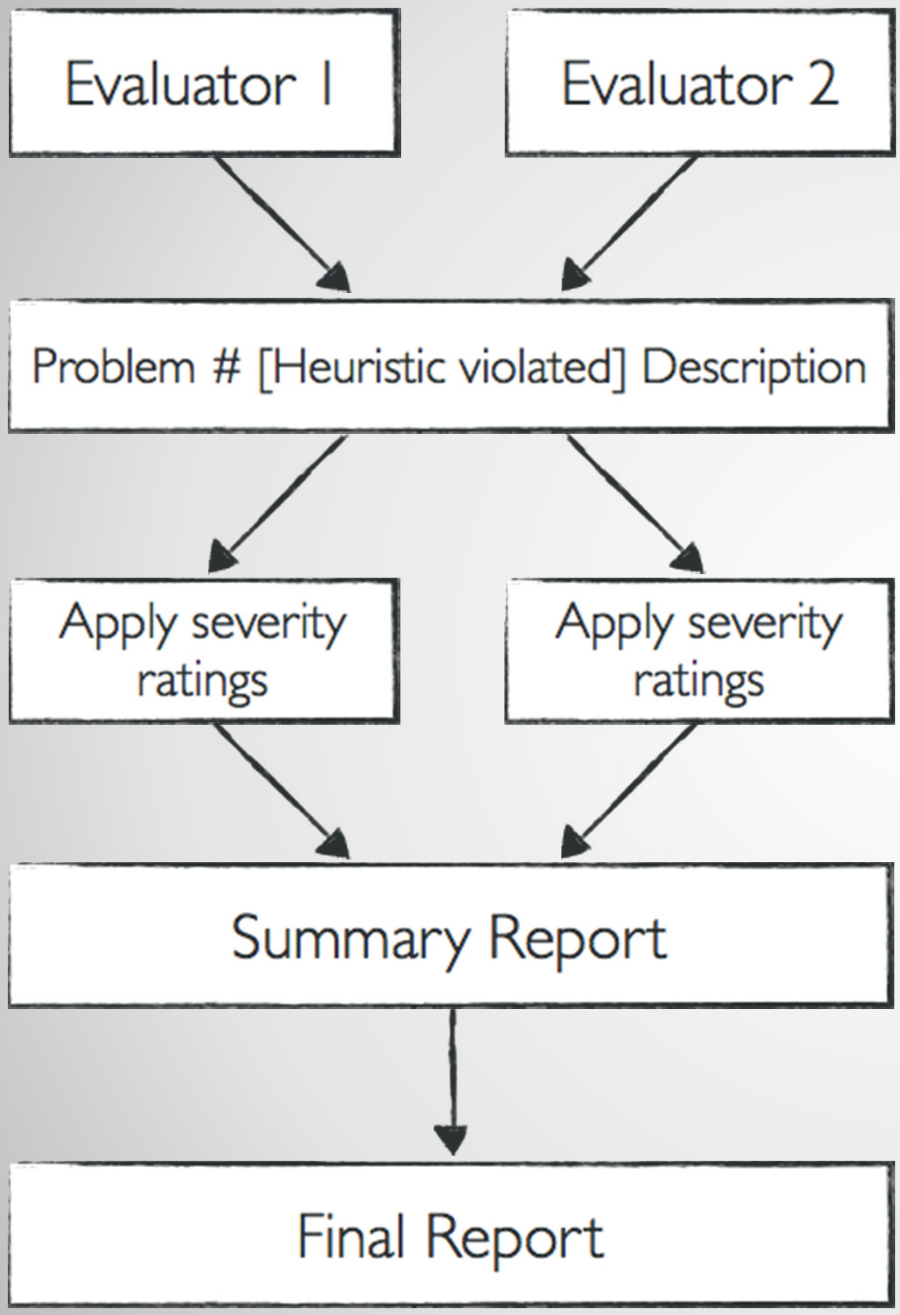
Total number of usability problems in the design

Number of evaluators

$$N=(1-(1-L)^n)$$

Proportion of problems discovered per evaluator

5



Multiple evaluators independently produce a list of usability problems.

Aggregate findings into a single list of problems and the heuristics violated. Eliminate redundancies and clarify.

Independently review the list and assign a severity rating to each problem.

Create a summary report is that includes the average severity rating for each problem. The evaluators and design team then go through a debriefing session, discuss the problems, potential fixes, and add fix ratings to the summary report.

UI Redesign / Next Prototype

Questions?

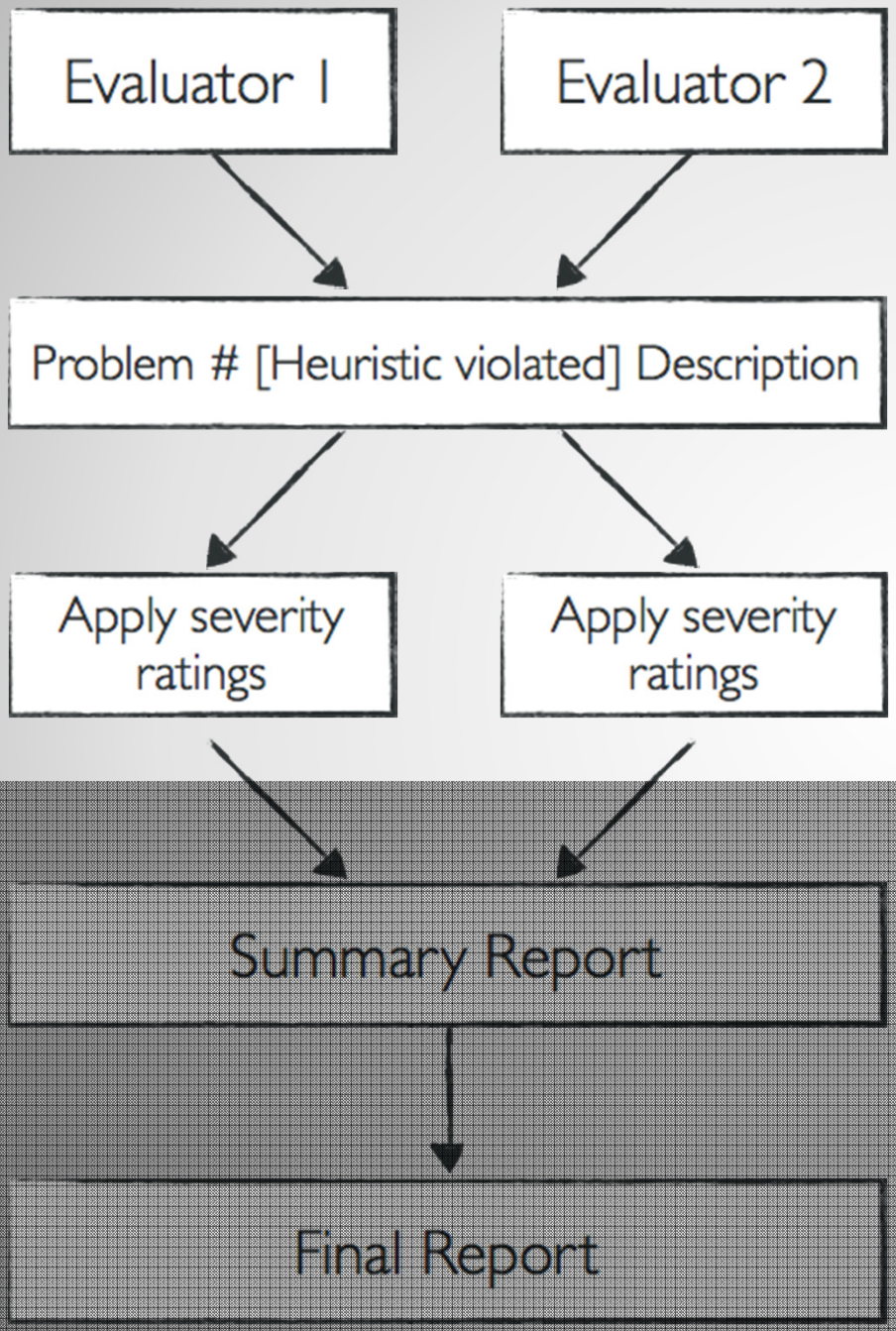
Severity & Fixability Ratings

Used to allocate resources to fix problems & make estimates for future usability efforts

Combination of **frequency**, **impact**, and **persistence**

Done independently by all evaluators

Done after the heuristic evaluation



Multiple evaluators independently produce a list of usability problems.

Aggregate findings into a single list of problems and the heuristics violated. Eliminate redundancies and clarify.

Independently review the list and assign a severity rating to each problem.

Components

Frequency

Will the problem be common or rare?

Impact

Is it easy or difficult for users to overcome?

Persistence

Will this be one-time or a repeated nuisance for users, even if they know about it?

Do not rate low persistence if problem causes users to abandon the application!

5-point Scale

0 = Not a problem at all

1 = Cosmetic problem only

2 = Minor usability problem, *fix with low priority*

3 = Major usability problem, *fix with high priority*

4 = Usability catastrophe, *must fix before release!*

In Table Form

Frequency \ Damage	*Low*	*High*
Low	Not severe at all. *Ignorable.*	Severe. *Should be addressed.*
High	Annoyances. *Should be addressed.*	Catastrophic. *Must be addressed.*

Heuristic Evaluation Form

Evaluator ID

Name of problem

Evidence
- Heuristic, interface aspect

Explanation
- Severity: rating (number and name), frequency, impact, persistence, how you weighted these factors

Possible solutions/Trade offs

Advantages of Heuristic Evaluation

"Discount usability engineering"

Don't need to identify tasks/activities

Can identify low-cost, high-value fixes

Can expose problems user testing doesn't (e.g., with expert functions)

Provides a language for justifying usability recommendations

Can be used with any level of prototyping

Disadvantages of Heuristic Evaluation

Non-empirical, thus un-validated

Unreliable (different people identify different problems)

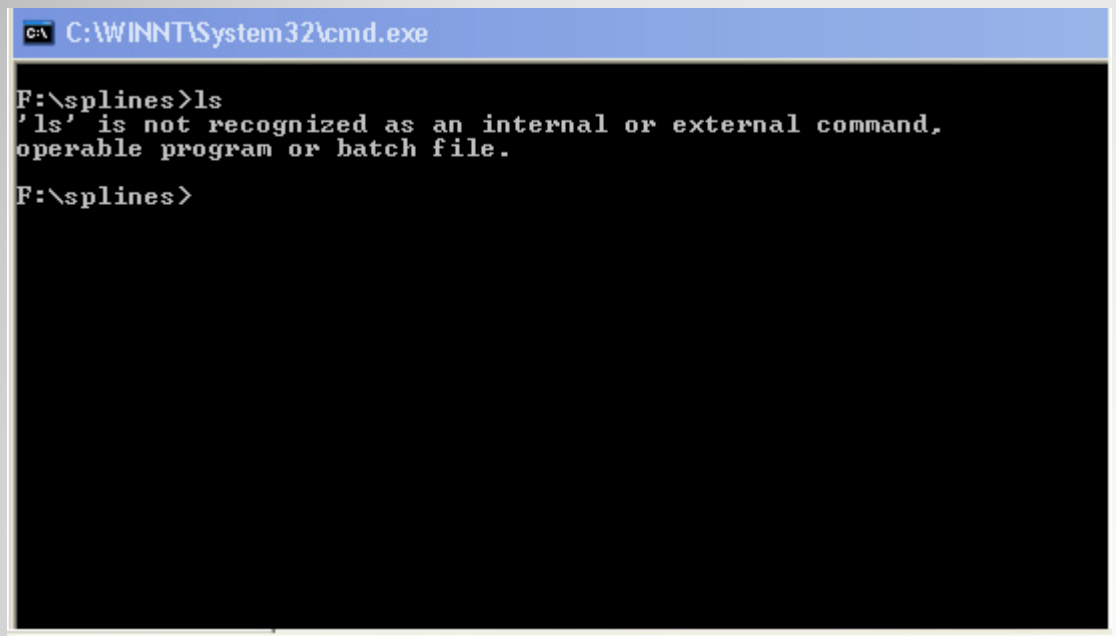
Needs usability experts

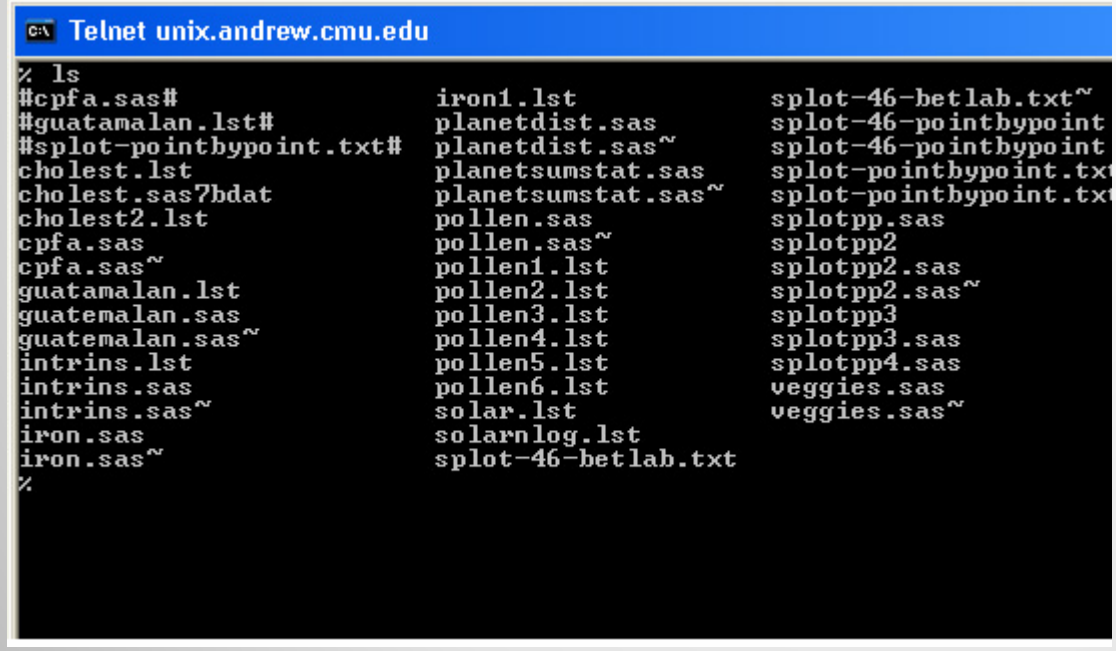
Problems are unconnected

Heuristics may be hard to apply to new technology

Coordination costs

Questions?





1. Visibility of system status

2. Match between system and the real world

3. User control and freedom

4. Consistency and standards

5. Error prevention

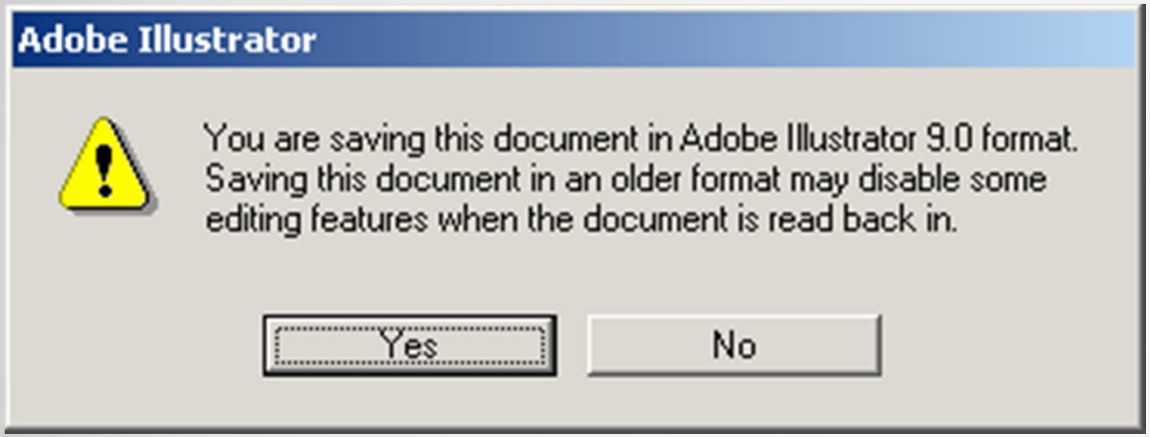
6. Recognition rather than recall

7. Flexibility and efficiency of use

8. Aesthetic and minimalist design

9. Help users recognize, diagnose, and recover from errors

10. Help and documentation



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