

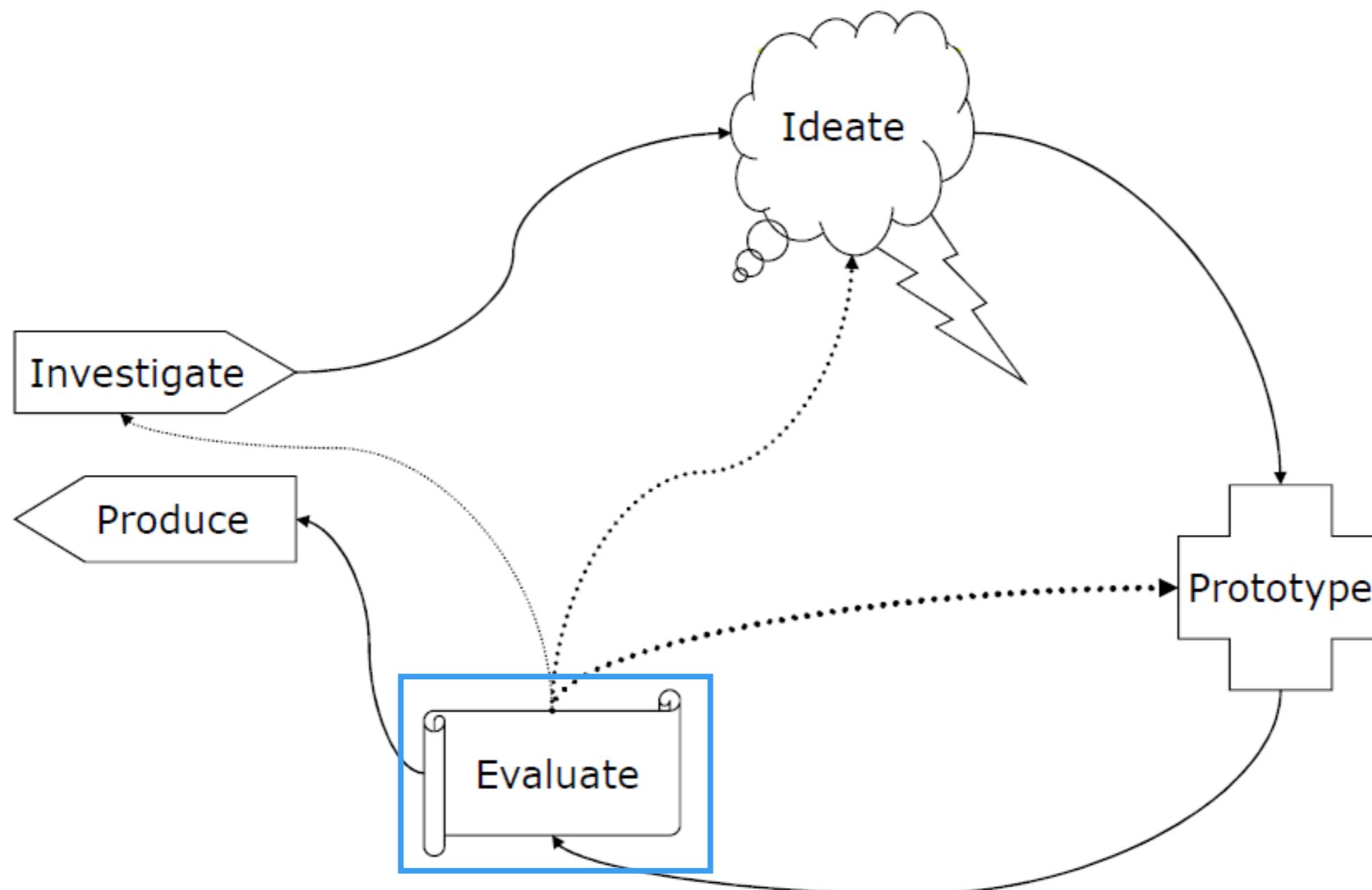
Human-Computer Interaction

CPSC 481 - Spring 2019

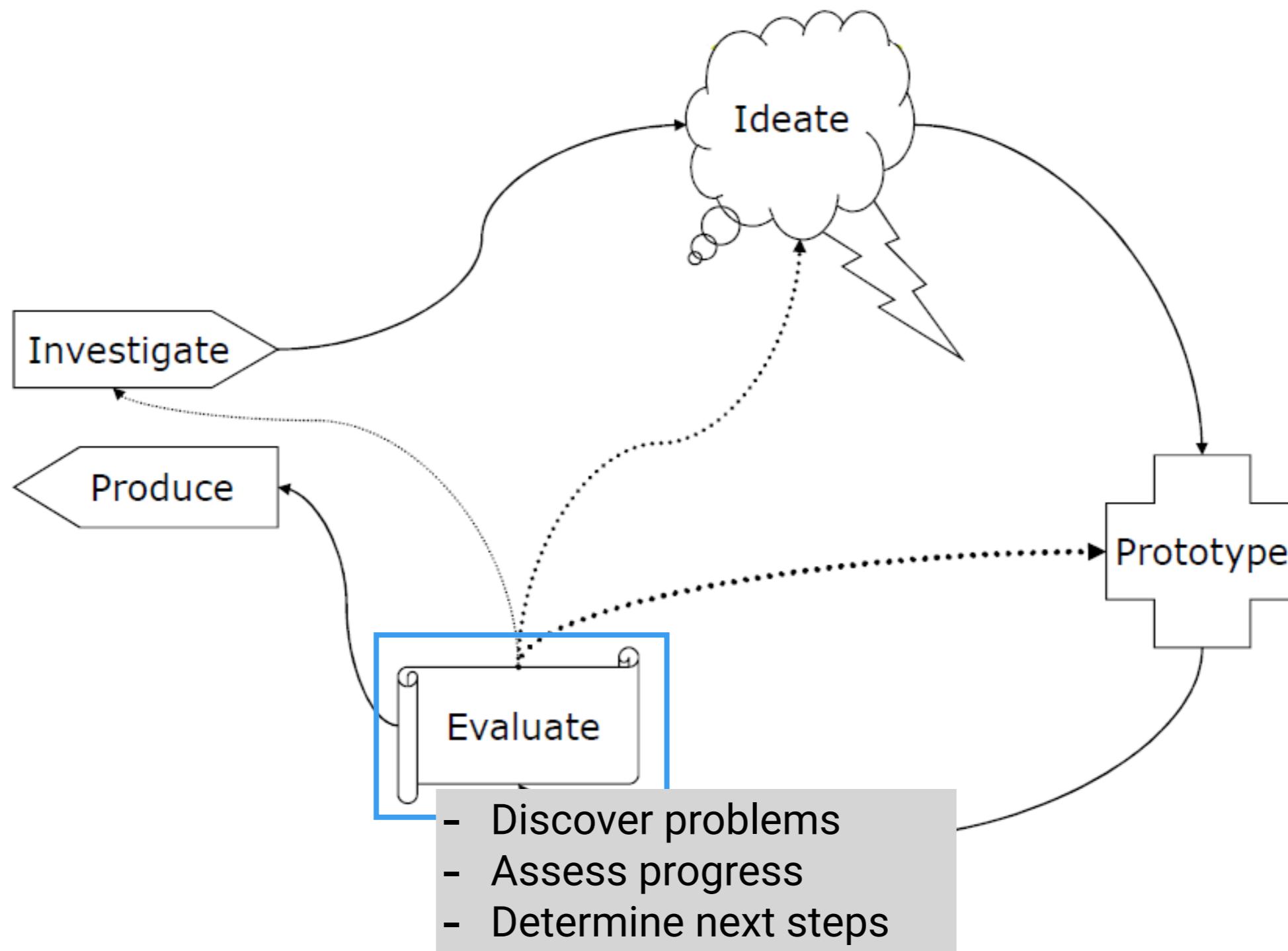
Inspection Evaluation

With acknowledgements to Tony Tang

Evaluate



Evaluate



Why evaluation?

Why evaluation?

- Automated processes can find bugs, but not usability issues
- Evaluation gives you a way to move forward
 - What needs to be fixed, added, removed?

Why evaluation?

- Automated processes can find bugs, but not usability issues
- Evaluation gives you a way to move forward
 - What needs to be fixed, added, removed?
- Answers to two questions:
 - Did we build the right thing?
 - Did we build the thing right?

Which evaluation method to choose?

- Time
- Cost
- Required number of specialists
- Required number of users
- Physical environment configuration
- Equipments

In most organizations, you have three major options

- **“Inspection Evaluations”**
 - *Idea:* a principled “by myself” walkthrough of an interface
- **Usability Test**
- **Field Deployment**

Inspection Evaluation

Inspection Evaluation

- Who evaluates?

Inspection Evaluation

- Who evaluates?
 - Usability specialist
 - Software development consultants specialized in a particular interface style

Inspection Evaluation

- Who evaluates?
 - Usability specialist
 - Software development consultants specialized in a particular interface style
- Inspection methods
 - Heuristic Evaluation
 - Guideline Review
 - Cognitive Walkthrough

Cognitive Walkthrough

Cognitive Walkthrough

- The cognitive walkthrough is a usability evaluation method in which one or more evaluators work through a series of tasks and ask a set of questions from the perspective of the user.
- The focus of the cognitive walkthrough is on understanding the system's learnability for new or infrequent users.
- The cognitive walkthrough was originally designed as a tool to evaluate walk-up-and-use systems like postal kiosks, ATMs, and interactive exhibits in museums where users would have little or no training.
- However, the cognitive walkthrough has been employed successfully with more complex systems like CAD software and software development tools to understand the first experience of new users.

Guideline Review

Guideline Review

- The interface is inspected to check whether it complies to a series of very specific guidelines.
- These guidelines are usually arranged in checklists, in which the evaluator indicates whether or not a particular item complies to a particular guideline.
- These checklists usually have a large number of items, depending on the size of the application being checked, it may take days or weeks for a full evaluation to take place.

Guideline Review

USERFOCUS

[Home](#) [Usability consultancy](#) [Usability training](#) [Articles & Resources](#) [About Us](#)

247 web usability guidelines

Although designing usable systems requires far more than simply applying guidelines, guidelines can still make a significant contribution to usability by promoting consistency and good practice. We use this list of guidelines in our consultancy work. For best results, remember to interpret the guideline in context — this requires a bit more thought but ensures you will get a lot more from your review. — [DAVID TRAVIS](#), OCTOBER 22, 2014. LAST UPDATED APRIL 12 2016

Web usability guidelines

- Home page usability
- Task orientation
- Navigation and IA
- Forms and data entry
- Trust and credibility
- Writing and content quality
- Page layout and visual design
- Search usability
- Help, feedback and error tolerance



Photo by Tirza van Dijk on Unsplash

"One of the best spreadsheets I've ever seen!" – @handrus

"This covers it all! Great resource-->RT." – @WP4SmallBiz

"Definitely Bookmarked!!" – @gregprogramming

"Well thought out info for improving site usability." – @stevemclintock

"Une mine d'or!" – @profstiwiw

"This is fab,fab,fab RT." – @blakey

Web usability guidelines

- [Home page usability](#): 20 guidelines to evaluate the usability of home pages.
- [Task orientation](#): 44 guidelines to evaluate how well a web site supports the users tasks.
- [Navigation and IA](#): 29 guidelines to evaluate navigation and information architecture.
- [Forms and data entry](#): 23 guidelines to evaluate forms and data entry.
- [Trust and credibility](#): 13 guidelines to evaluate trust and credibility.
- [Writing and content quality](#): 23 guidelines to evaluate writing and content quality.
- [Page layout and visual design](#): 38 guidelines to evaluate page layout and visual design.
- [Search usability](#): 20 guidelines to evaluate search.
- [Help, feedback and error tolerance](#): 37 guidelines to evaluate help, feedback and error tolerance.



[Download an Excel workbook containing all 247 web usability guidelines](#)

20 home page usability guidelines

The home page is an organisation's face to the world and the point at which users decide to interact with an organisation. It needs to strike a balance between showing the range of items on offer and simplifying the content to ensure that the majority of customers can easily embark on the most common tasks.

Web usability guidelines

Home page usability

Task orientation

Navigation and IA

Forms and data entry

Trust and credibility

Writing and content quality

Page layout and visual design

Search usability

Help, feedback and error tolerance

List of home page usability guidelines

1. The items on the home page are clearly focused on users' key tasks ("featuritis" has been avoided).
2. If the site is large, the home page contains a search input box.
3. Product categories are provided and clearly visible on the homepage.
4. Useful content is presented on the home page or within one click of the home page.
5. The home page shows good examples of real site content.
6. Links on the home page begin with the most important keyword (e.g. "Sun holidays" not "Holidays in the sun").
7. There is a short list of items recently featured on the homepage, supplemented with a link to archival content.
8. Navigation areas on the home page are not over-formatted and users will not mistake them for adverts.
9. The value proposition is clearly stated on the home page (e.g. with a tagline or welcome blurb).
10. The home page contains meaningful graphics, not clip art or pictures of models.
11. Navigation choices are ordered in the most logical or task-oriented manner (with the less important corporate information at the bottom).
12. The title of the home page will provide good visibility in search engines like Google.
13. All corporate information is grouped in one distinct area (e.g. "About Us").
14. Users will understand the value proposition.
15. By just looking at the home page, the first time user will understand where to start.
16. The home page shows all the major options.
17. The home page of the site has a memorable URL.
18. The home page is professionally designed and will create a positive first impression.
19. The design of the home page will encourage people to explore the site.
20. The home page looks like a home page; pages lower in the site will not be confused with it.



[Download an Excel workbook containing all 247 web usability guidelines](#)

AutoSave OFF

ExpertReviewCheckpoints.xls [Compatibility Mode]

Search Sheet

Share

Home Insert Page Layout Formulas Data Review View

Paste B I U A Wrap Text General Conditional Formatting

Merge & Center Format as Table Cell Styles Insert Delete Format

AutoSum Fill Clear Sort & Filter

D10 fx

A B C D E F G H I J K L M N O

1 Home Page

2

3

4

5

6

7

8 Checkpoint

The items on the home page are clearly focused on users' key tasks ("featuritis" has been avoided)

The home page contains a search input box

Product categories are provided and clearly visible on the homepage

Useful content is presented on the home page or within one click of the home page

The home page shows good examples of real site content

Links on the home page begin with the most important keyword (e.g. "Sun holidays" not "Holidays in the sun")

There is a short list of items recently featured on the homepage, supplemented with a link to archival content

Navigation areas on the home page are not over-formatted and users will not mistake them for adverts

The value proposition is clearly stated on the home page (e.g. with a tagline or welcome blurb)

The home page contains meaningful graphics, not clip art or pictures of models

Navigation choices are ordered in the most logical or task-oriented manner (with the less important corporate information at the bottom)

The title of the home page will provide good visibility in search engines like Google

All corporate information is grouped in one distinct area (e.g. "About Us")

Users will understand the value proposition

By just looking at the home page, the first time user will understand where to start

The home page shows all the major options

The home page of the site has a memorable URL

The home page is professionally designed and will create a positive first impression

The design of the home page will encourage people to explore the site

The home page looks like a home page; pages lower in the site will not be confused with it

Comments

Instructions Results Home Page Task Orientation Navigation & IA Forms & Data Entry Trust & Credibility Writing & Content Quality Page Layout & VI +

Ready 100%

ExpertReviewCheckpoints.xls [Compatibility Mode]

Home Insert Page Layout Formulas Data Review View

Paste B I U A Wrap Text General Conditional Formatting

Merge & Center Format as Table Cell Styles Insert Delete Format

D10 fx

A B C D E F G H I J K L M N O

Page Layout & Visual Design

Checkpoint

The screen density is appropriate for the target users and their tasks

The layout helps focus attention on what to do next

On all pages, the most important information (such as frequently used topics, features and functions) is presented on the first screenful of information ("above the fold")

The site can be used without scrolling horizontally

Things that are clickable (like buttons) are obviously pressable

Items that aren't clickable do not have characteristics that suggest that they are

The functionality of buttons and controls is obvious from their labels or from their design

Clickable images include redundant text labels (i.e. there is no 'mystery meat' navigation)

Hypertext links are easy to identify without needing to 'minesweep' (e.g. underlined)

Fonts are used consistently

The relationship between controls and their actions is obvious

Icons and graphics are standard and/or intuitive (concrete and familiar)

There is a clear visual "starting point" to every page

Each page on the site shares a consistent layout

Pages on the site are formatted for printing, or there is a printer-friendly version

Buttons and links show that they have been clicked

GUI components (like radio buttons and check boxes) are used appropriately

Fonts are readable

The site avoids italicised text and uses underlining only for hypertext links

There is a good balance between information density and use of white space

The site is pleasant to look at

Pages are free of "scroll stoppers" (headings or page elements that create the illusion that users have reached the top or bottom of a page when they have not)

The site avoids extensive use of upper case text

The site has a consistent, clearly recognisable look and feel that will engage users

Saturated blue is avoided for fine detail (e.g. text, thin lines and symbols)

Comments

Results Home Page Task Orientation Navigation & IA Forms & Data Entry Trust & Credibility Writing & Content Quality Page Layout & Visual Design

Ready 100%

Heuristic Evaluation

Heuristic Evaluation

- *Systematic inspection of an interface design to see if an interface complies with a set of usability heuristics, or usability guidelines.*
- Generally:
 - 3-5 inspectors (usability engineers, end users, experts...)
 - inspect interface in isolation (~1-2 hr for simple interfaces)
 - results are aggregated afterwards
 - single evaluator catches ~35% usability problems
 - 5 evaluators catch ~75%

Heuristic Evaluation

- A heuristic is a rule of thumb – a principle that is a shortcut for solving a problem or making decisions
 - *never chase after a bus, another one is coming...*
 - *stuck in traffic: car in the lane next to me passed me >> that lane must be moving faster*
- Not always right/true, but cognitive shortcuts

Heuristic Evaluation

- **Design Heuristics**
 - Broad usability statements that can guide a developer's design efforts
 - Derived from common design problems across many systems
 - Several researchers and practitioners have developed different sets of heuristics (e.g. **domain specific**)

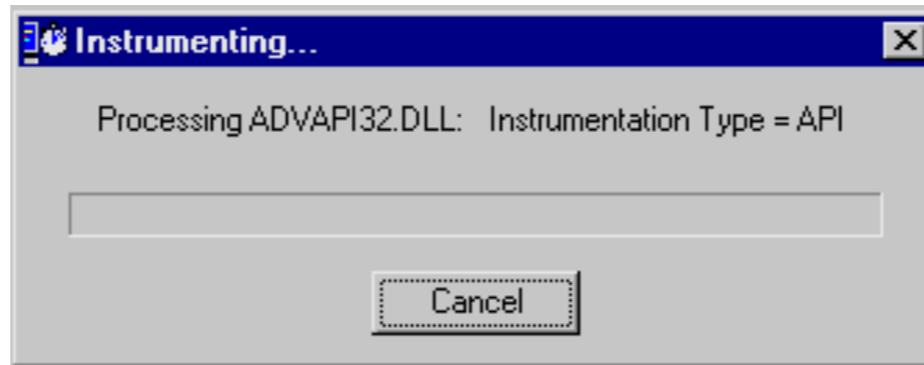
Heuristic Evaluation

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

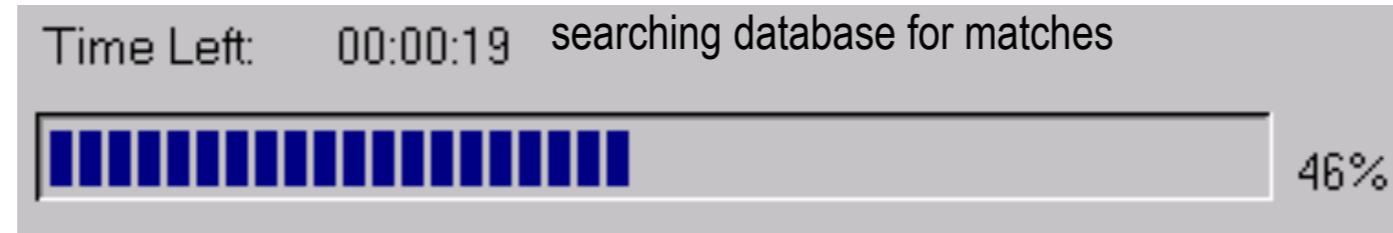
1. Visibility of system status

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

1. Visibility of system status



1. Visibility of system status

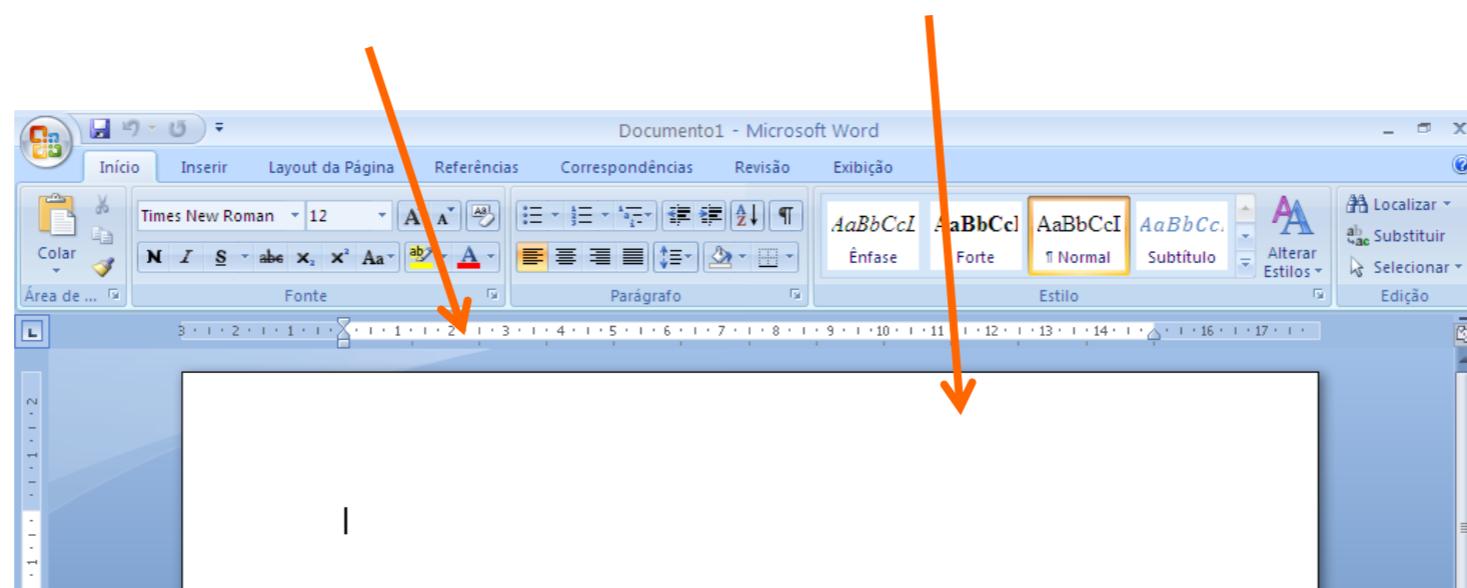


- example: *pay attention to response time*
 - 0.1 sec: no special indicators needed, why?
 - 1.0 sec: user tends to lose track of data
 - 10 sec: max. duration if user to stay focused on action
 - for longer delays, use percent-done progress bars

2. Match between system and the real world

- The system should speak the users' 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.

2. Match between system and the real world



3. User control and freedom

- 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.

3. User control and freedom

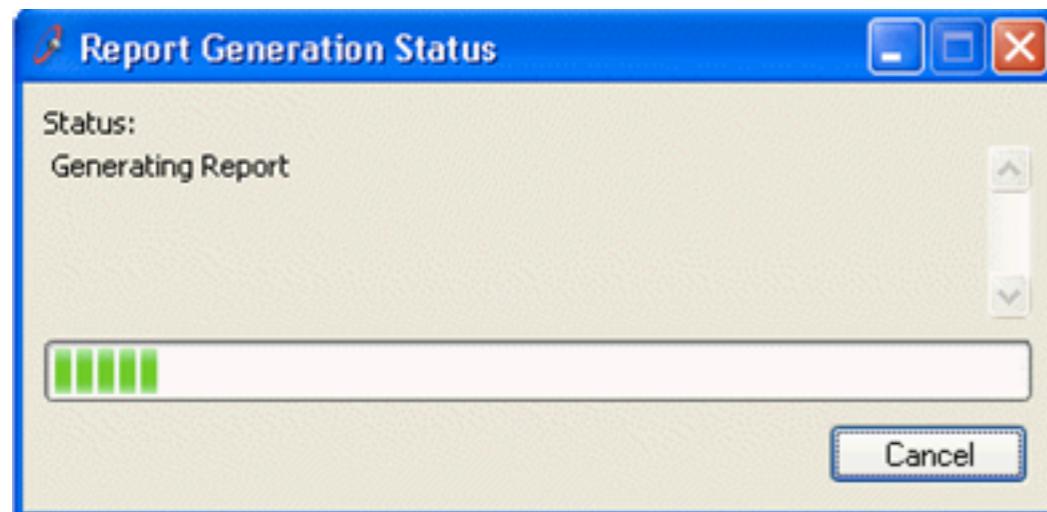


3. User control and freedom

Learning by exploring

Dealing with errors

User is sentient, computer is not



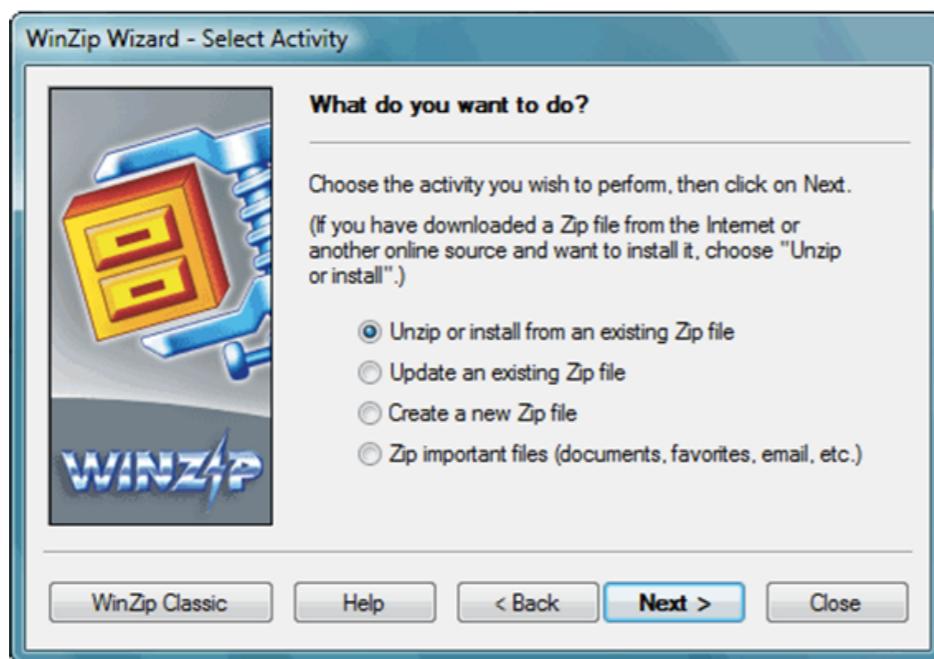
Long actions should be cancelable

3. User control and freedom

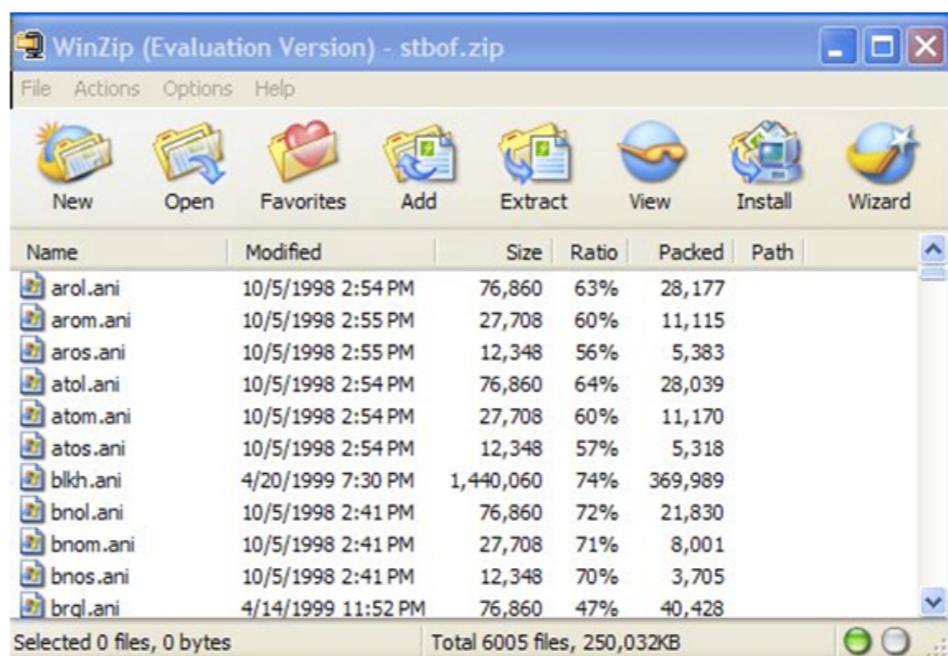


All dialogues should have a cancel button

3. User control and freedom



Wizard

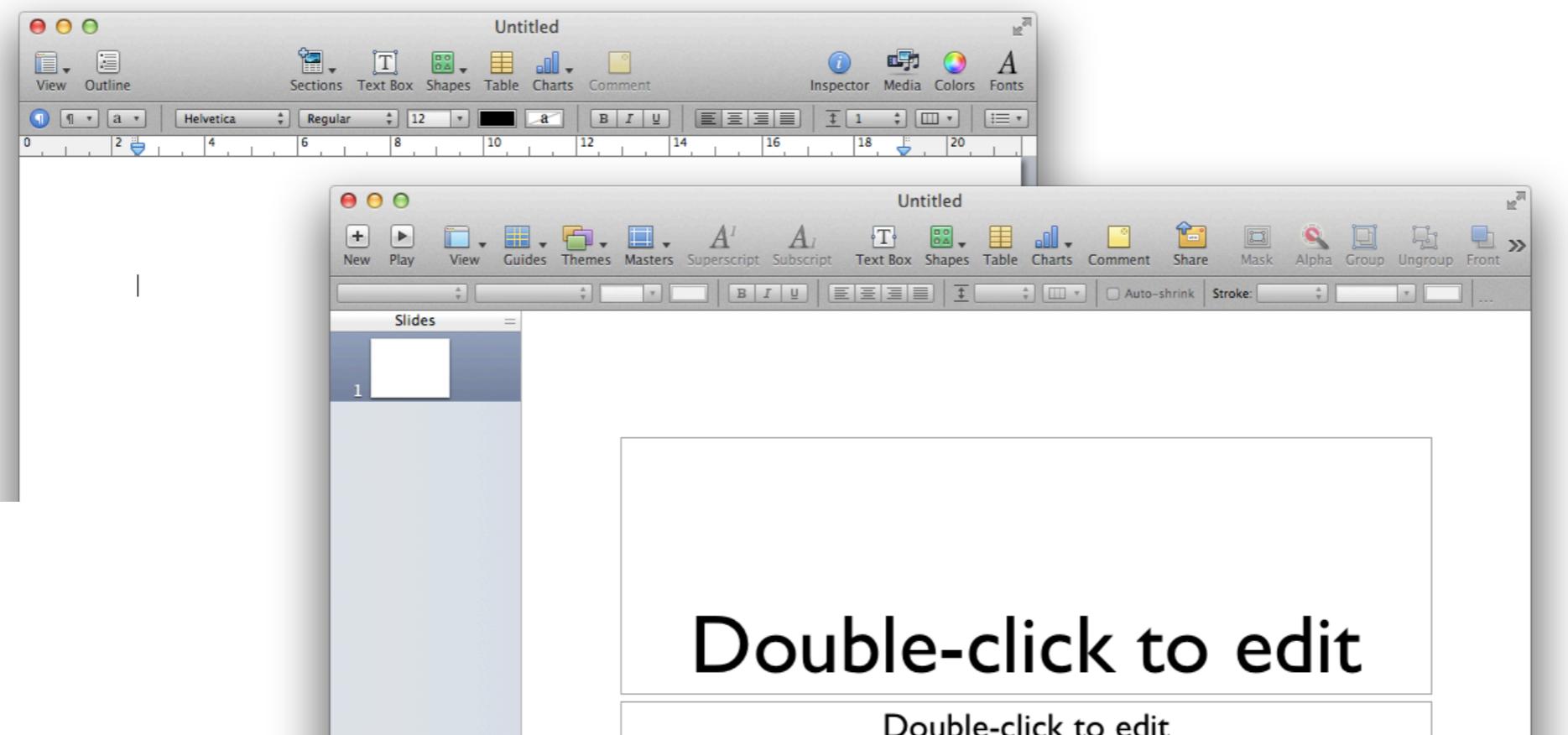


Center Stage

4. Consistency and standards

- Users should not have to wonder whether different words, situations, or actions mean the same thing.

4. Consistency and standards



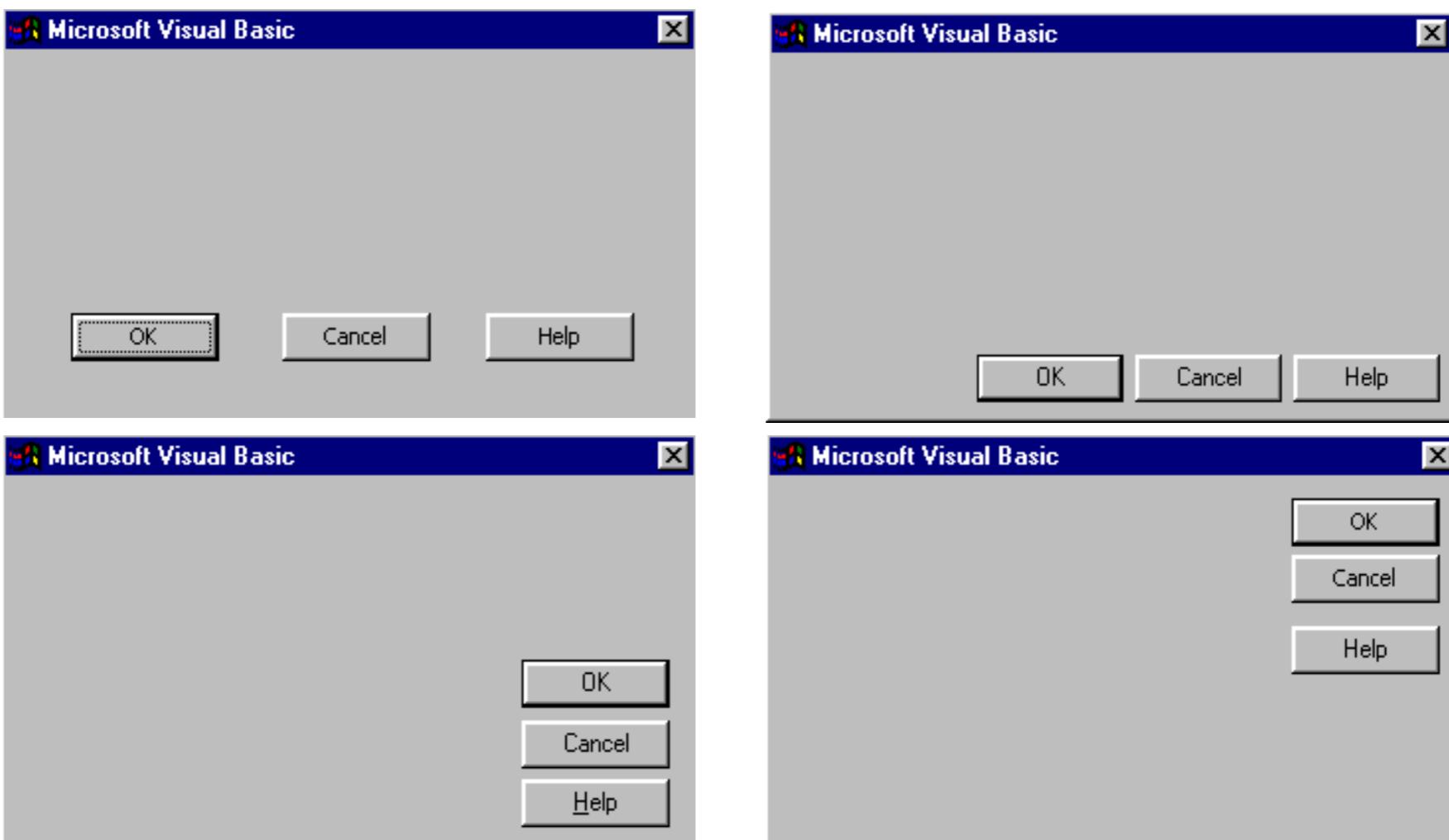
4. Consistency and standards

- Principle of least surprise
 - similar things should act similarly
 - different things should look different
- Adhere to platform guidelines
- Consistent language, colour, wording, ordering
- Consistent use of input syntax



4. Consistency and standards

- Goal: Predictability



4. Consistency and standards

Types of Consistency:

- **internal consistency** » is the interface consistent with itself?
- **external consistency** » is the design consistent with similar types of applications/applications on the platform?
- **metaphorical consistency** » is the design consistent with the similar real-world entity/object?

5. Error prevention

- Even better than good error messages is a careful design which prevents a problem from occurring in the first place.

5. Error prevention

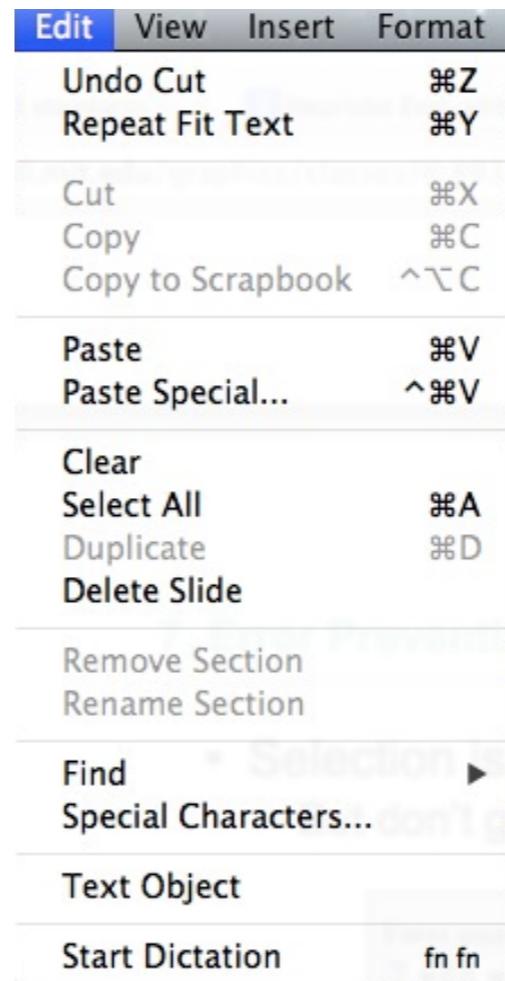
- Design to prevent errors from occurring
- Eliminate error-prone conditions
- Present users with a confirmation option before they commit to the action



5. Error prevention

Prevention techniques:

- **Grey out illegal commands**



5. Error prevention

Prevention techniques:

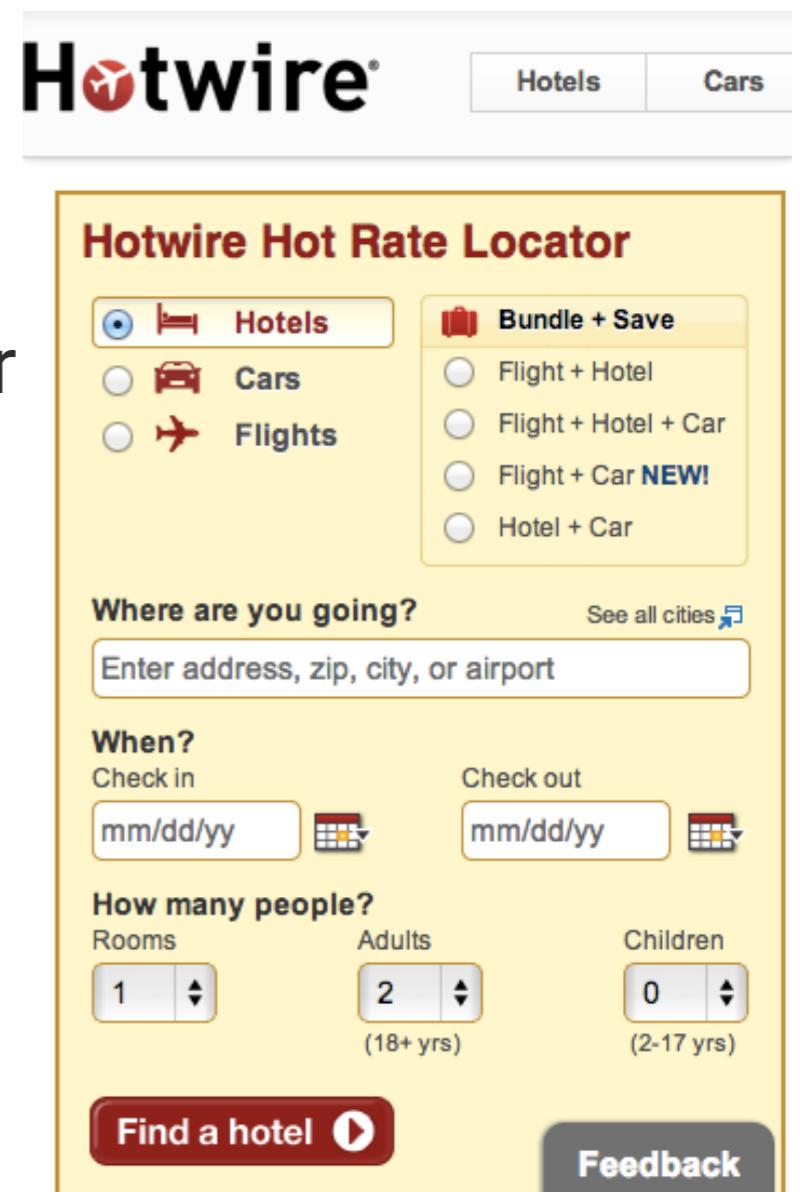
- **Avoid typing errors through selection**



5. Error prevention

Prevention techniques:

- Provides auto-complete for city
- Date picker for dates (while still allowing for text-entry)
- Greys out inappropriate “check out” dates given “check in” dates
- ...



The image shows the 'Hotwire Hot Rate Locator' search interface. At the top, there's a logo for 'Hotwire' with 'Hotels' and 'Cars' buttons. Below the logo is a section titled 'Hotwire Hot Rate Locator' with a radio button selected for 'Hotels'. To the right, there are other options: 'Bundle + Save', 'Flight + Hotel', 'Flight + Hotel + Car', 'Flight + Car NEW!', and 'Hotel + Car'. The main search area has fields for 'Where are you going?' (with a 'See all cities' link) and 'When?' (with 'Check in' and 'Check out' date pickers). Below that, there's a 'How many people?' section with dropdowns for 'Rooms' (1), 'Adults' (2, with '(18+ yrs)' note), and 'Children' (0, with '(2-17 yrs)' note). At the bottom are 'Find a hotel' and 'Feedback' buttons.

5. Error prevention

What do you think of this redesign?

<u>Undo</u>	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Del
Find...	Ctrl+F
Find <u>Next</u>	F3
Replace...	Ctrl+H
Go To...	Ctrl+G
Select All	Ctrl+A
Time/ <u>Date</u>	F5

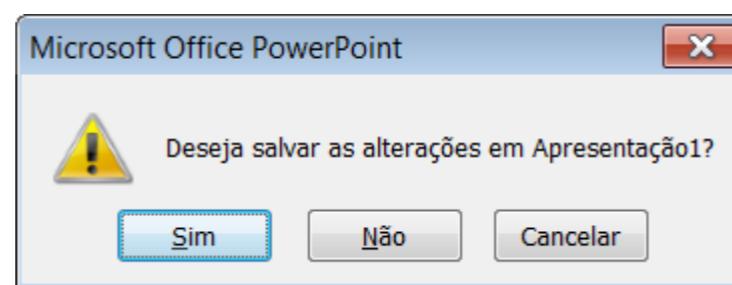
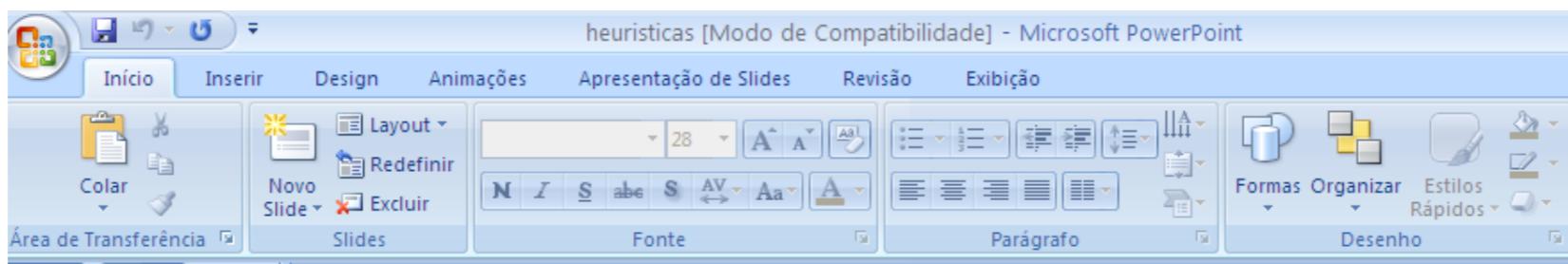


<u>Undo</u>	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Del
Find...	Ctrl+F
Find <u>Next</u>	F3
Replace...	Ctrl+H
Go To...	Ctrl+G
Select All	Ctrl+A
Time/ <u>Date</u>	F5

5. Error prevention

Prevention techniques:

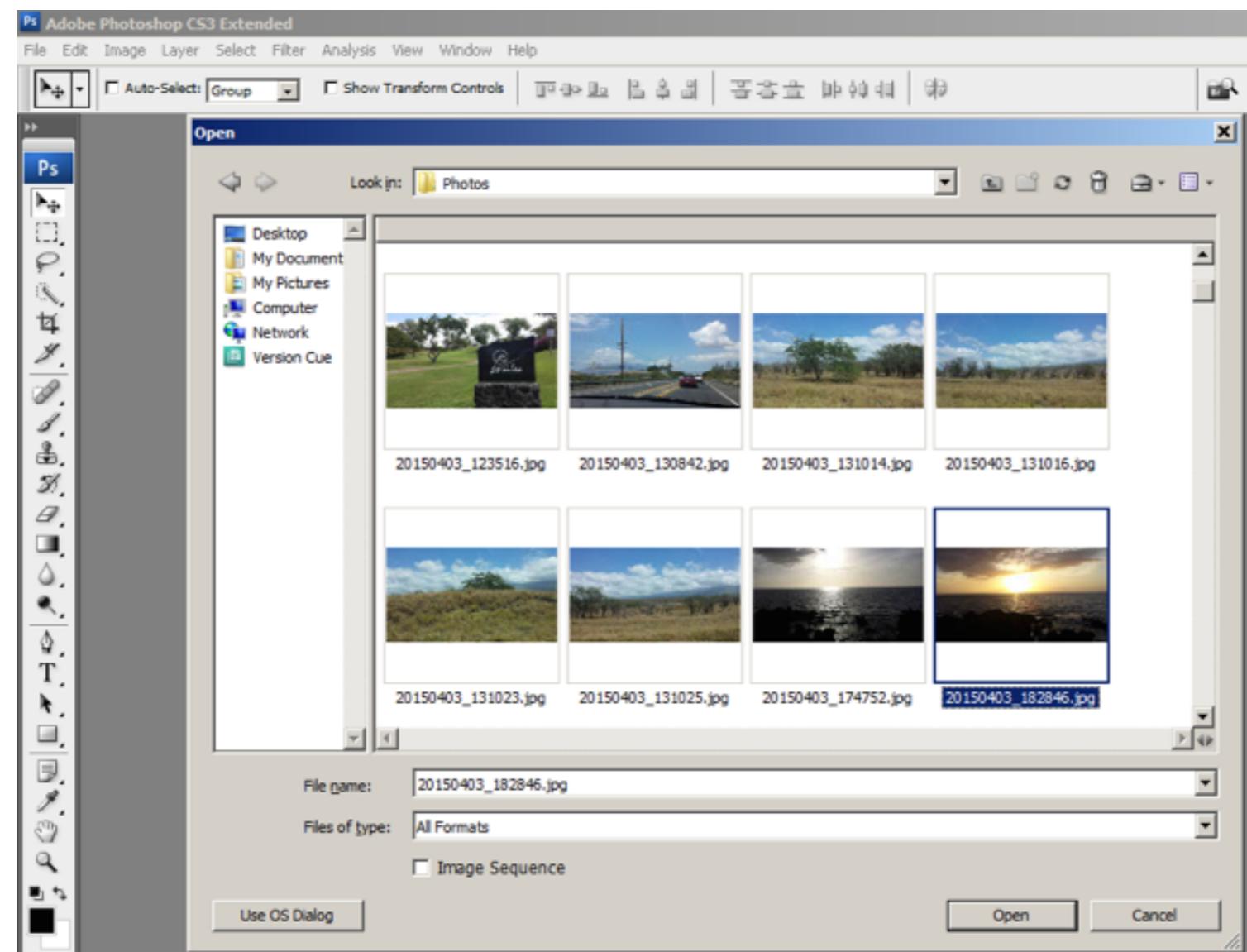
- Confirmation Dialogs



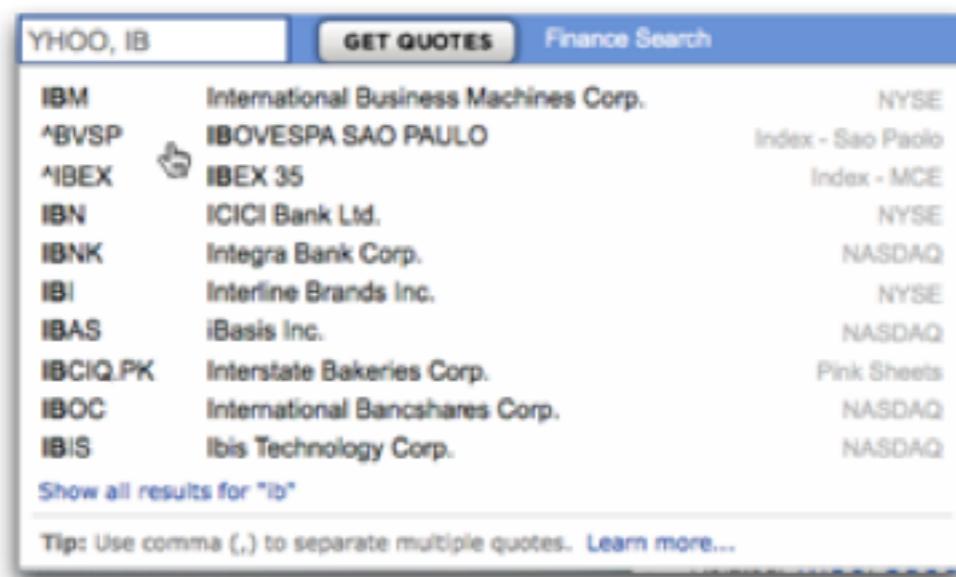
6. Recognition rather than recall

- Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another.

6. Recognition rather than recall



6. Recognition rather than recall



- Autocomplete is a nice example of how the system aids you. It is easier to recognize symbols rather than recall them from scratch.

A screenshot of a Karel script editor showing a script titled "002 Sprite Display.kpl". The script contains the following code:

```
1 | 1 Program UFO
2 | 2
3 | 3 Method Main()
4 | 4 P
5 | 5   PlaySound
6 | 6   PlaySoundLoop
7 | 7   Plum
8 | 8   PowderBlue
9 | 9   Power
10| 10  Print
11| 11  PrintInRectangle
12| 12  PrintLine
13| 13  Purple
14| 14  PutPixel
15| 15 End P
```

A tooltip is open over the "Print" command at line 10, showing its documentation:

As Sprite
`ufo.gif")`
Drawing.Print(Text As String)
Description: Prints the given text at the current pen location.
Parameters:
Text - Text to be displayed in the debug window

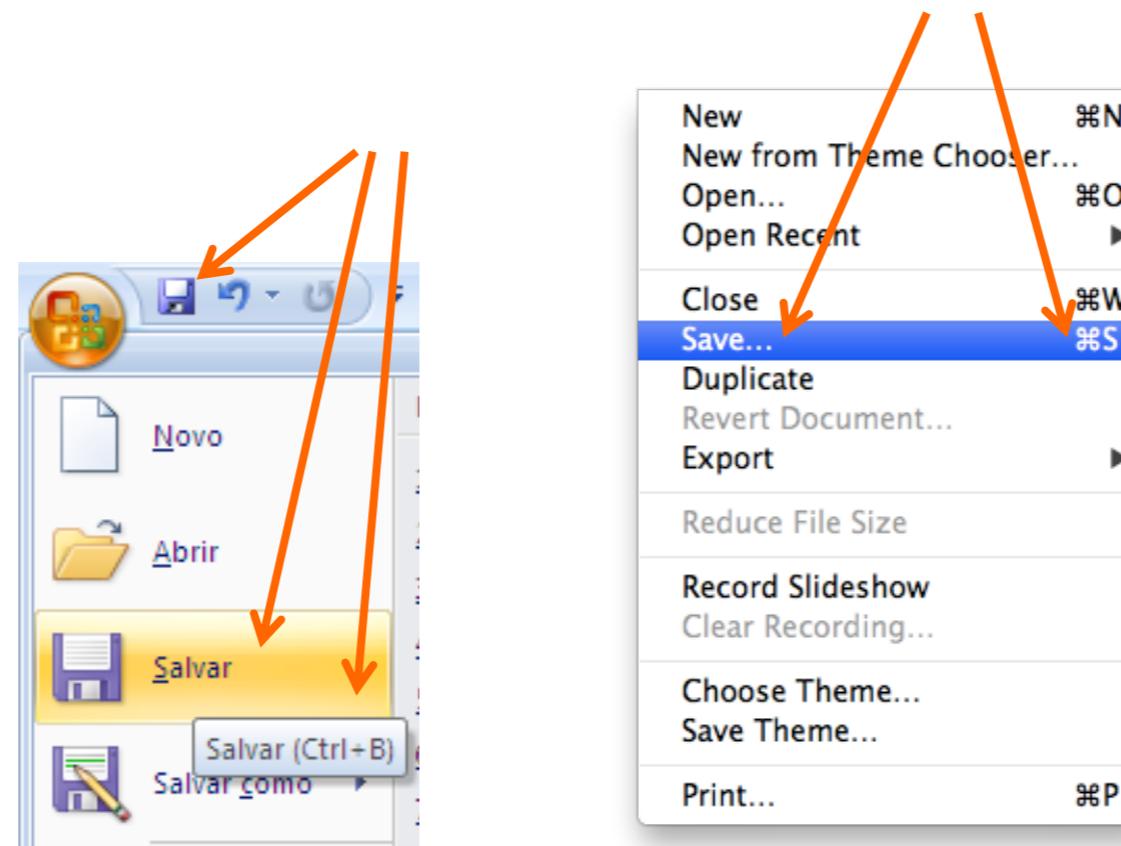
6. Recognition rather than recall



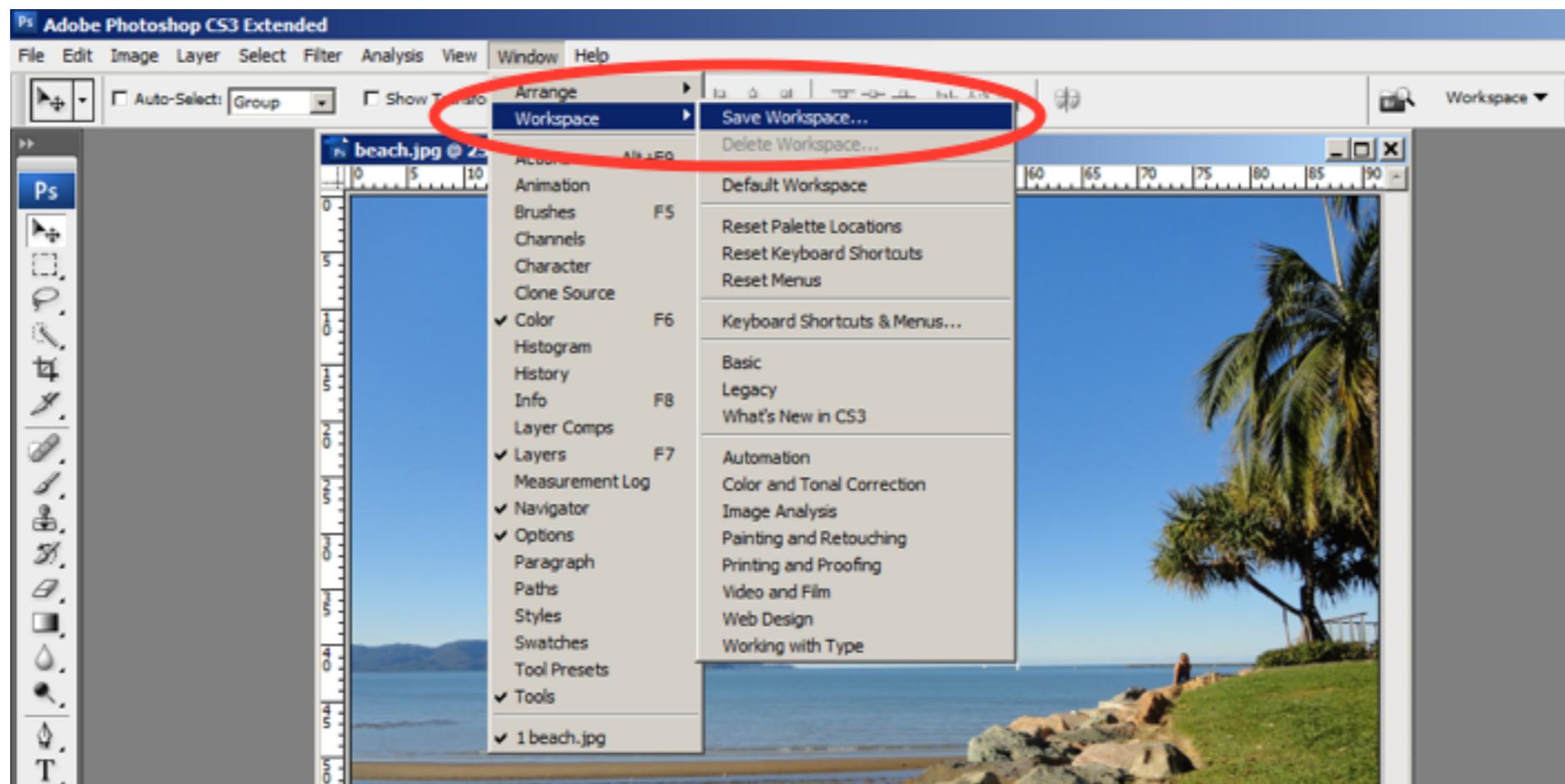
7. Flexibility and efficiency of use

- 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.

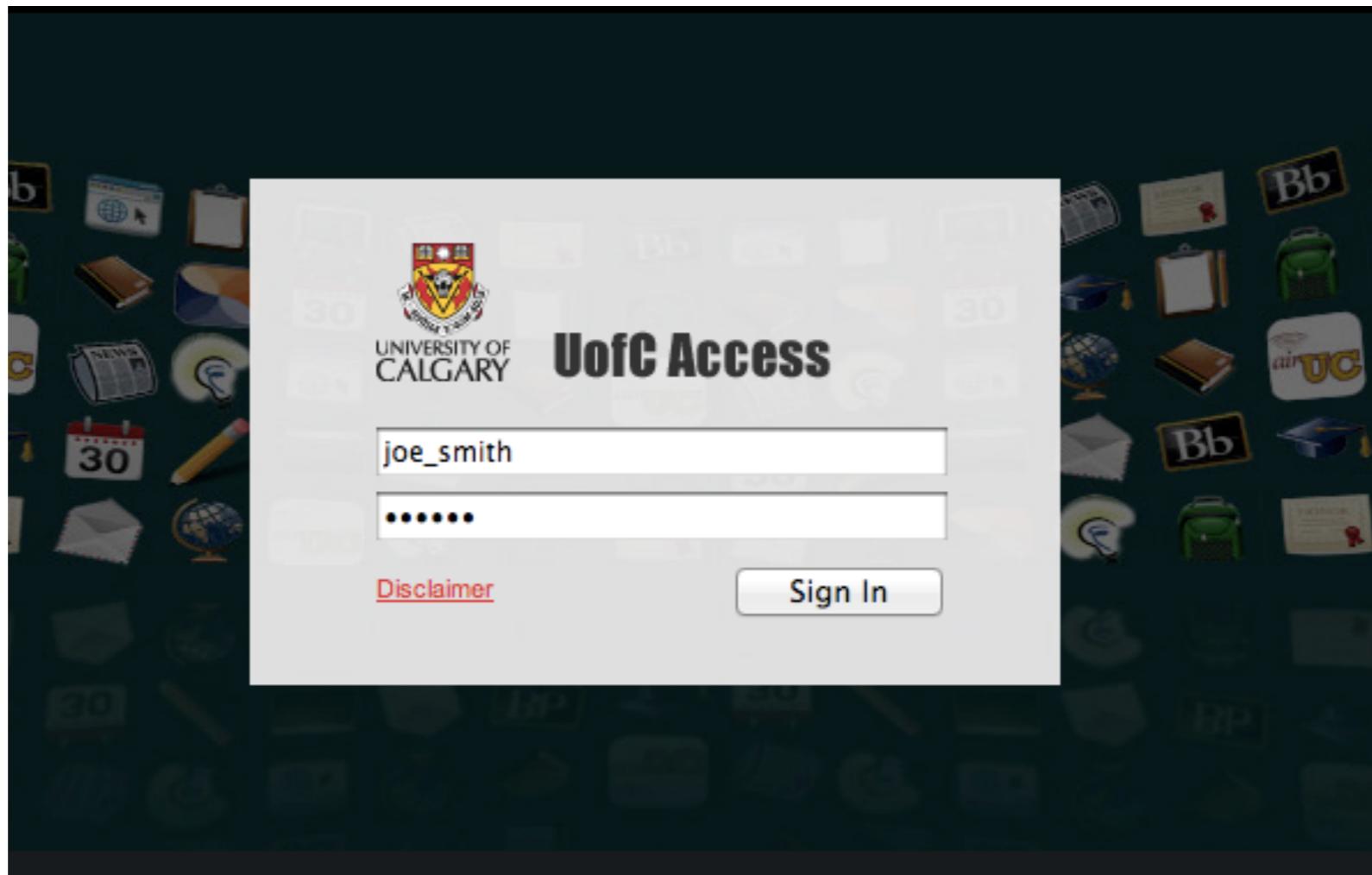
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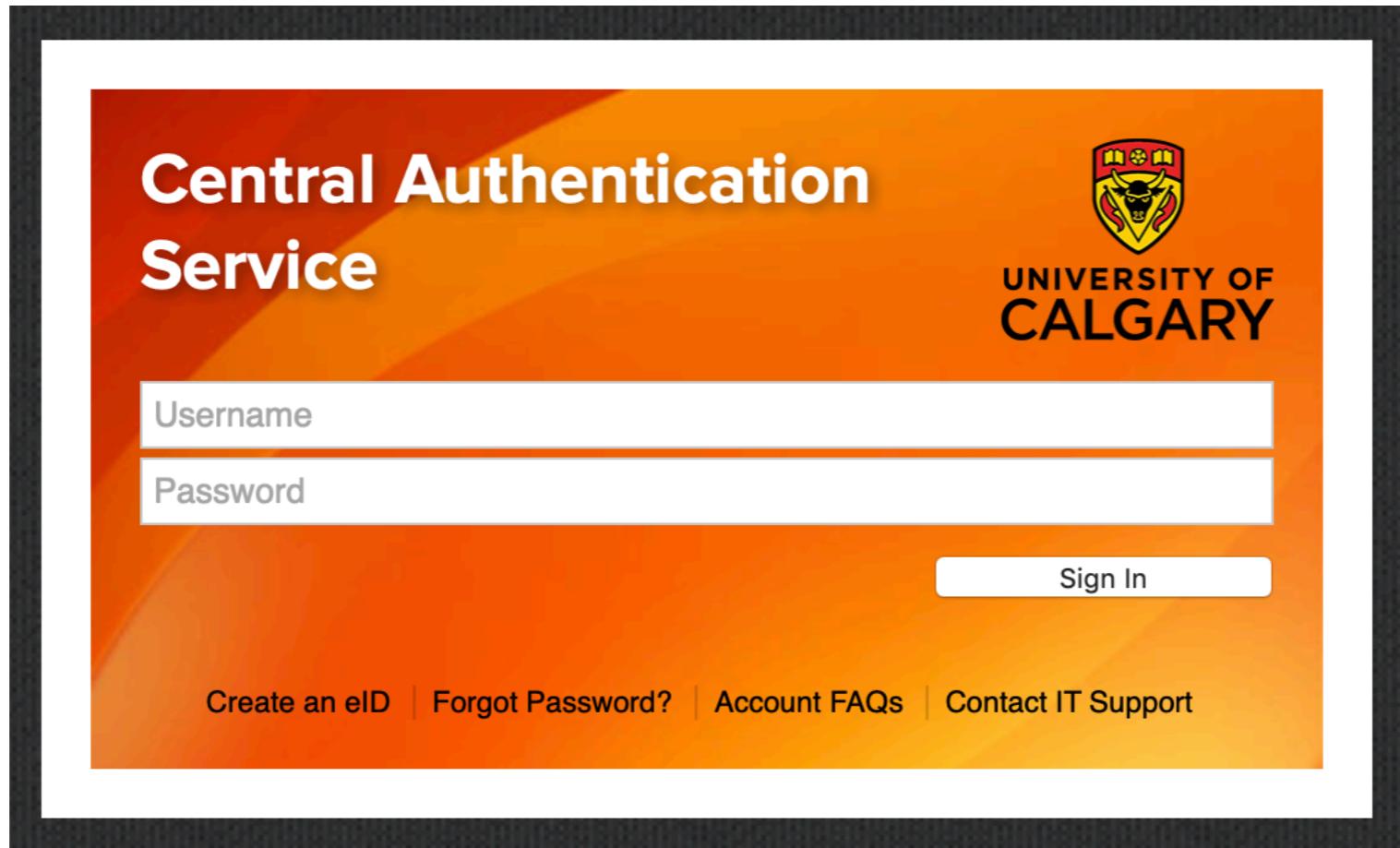
7. Flexibility and efficiency of use



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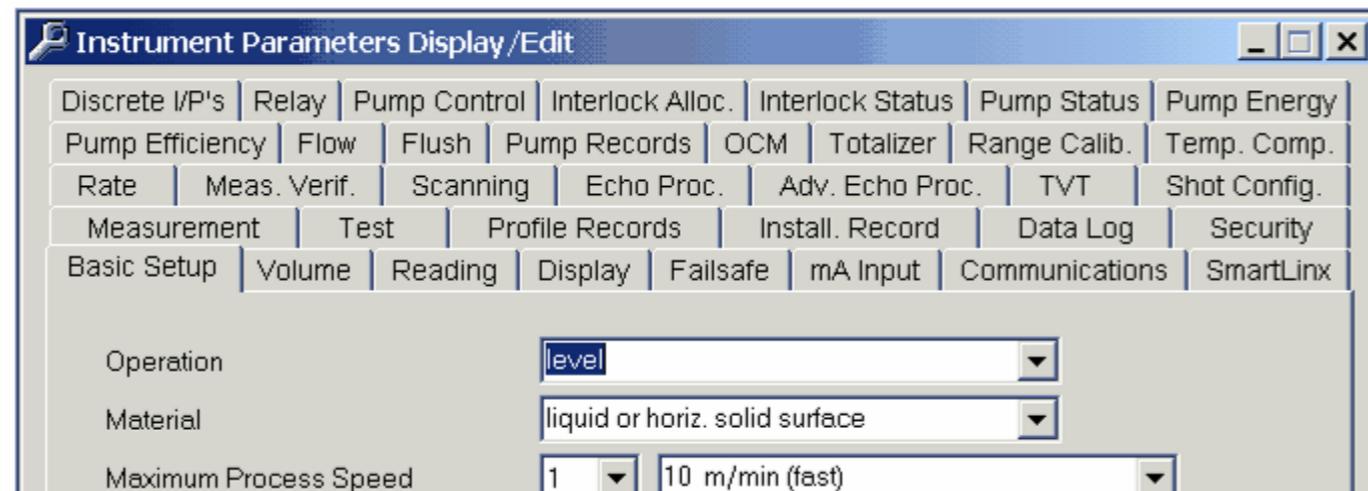
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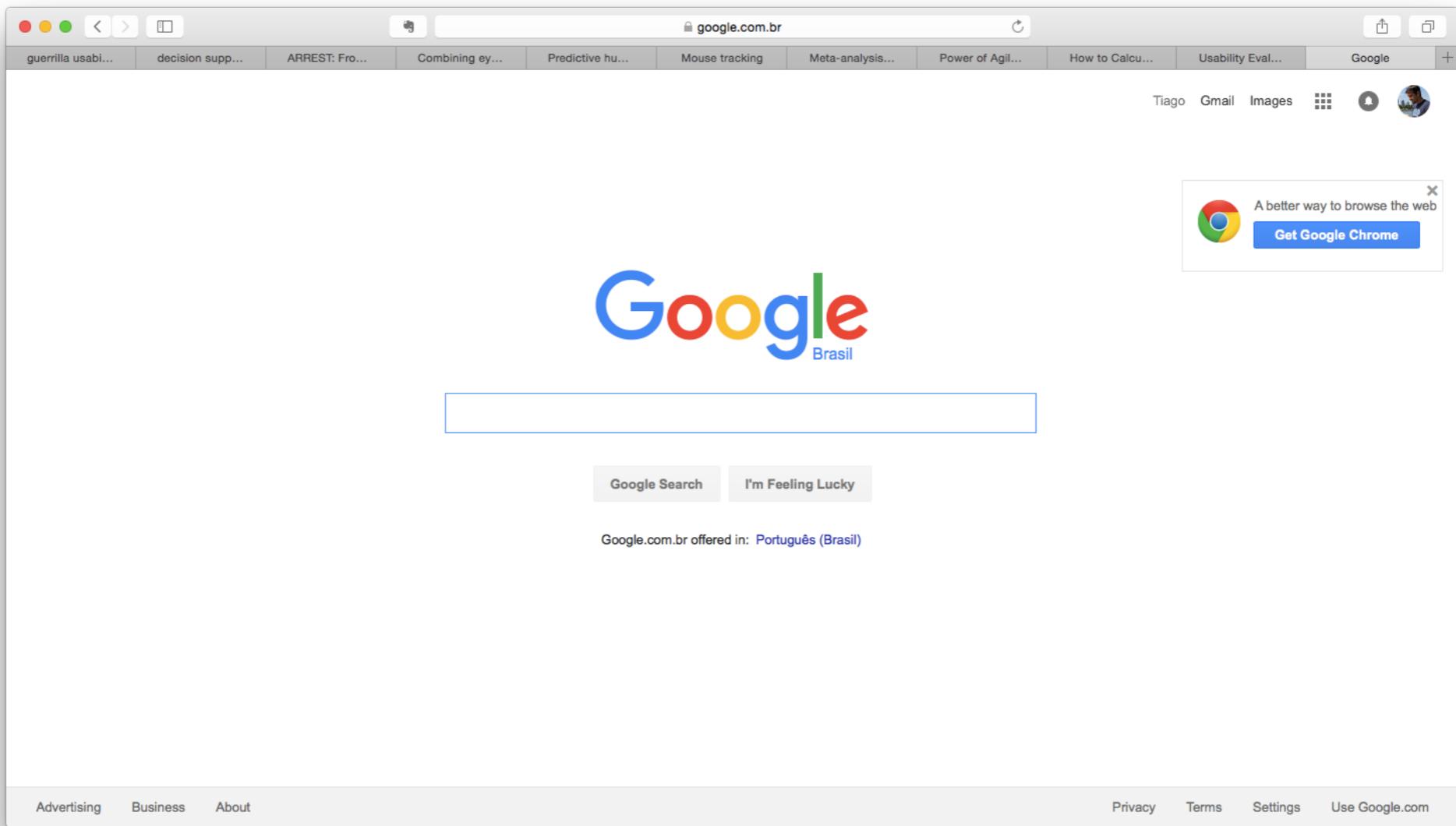
8. Aesthetic and minimalist design

- 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.

8. Aesthetic and minimalist design

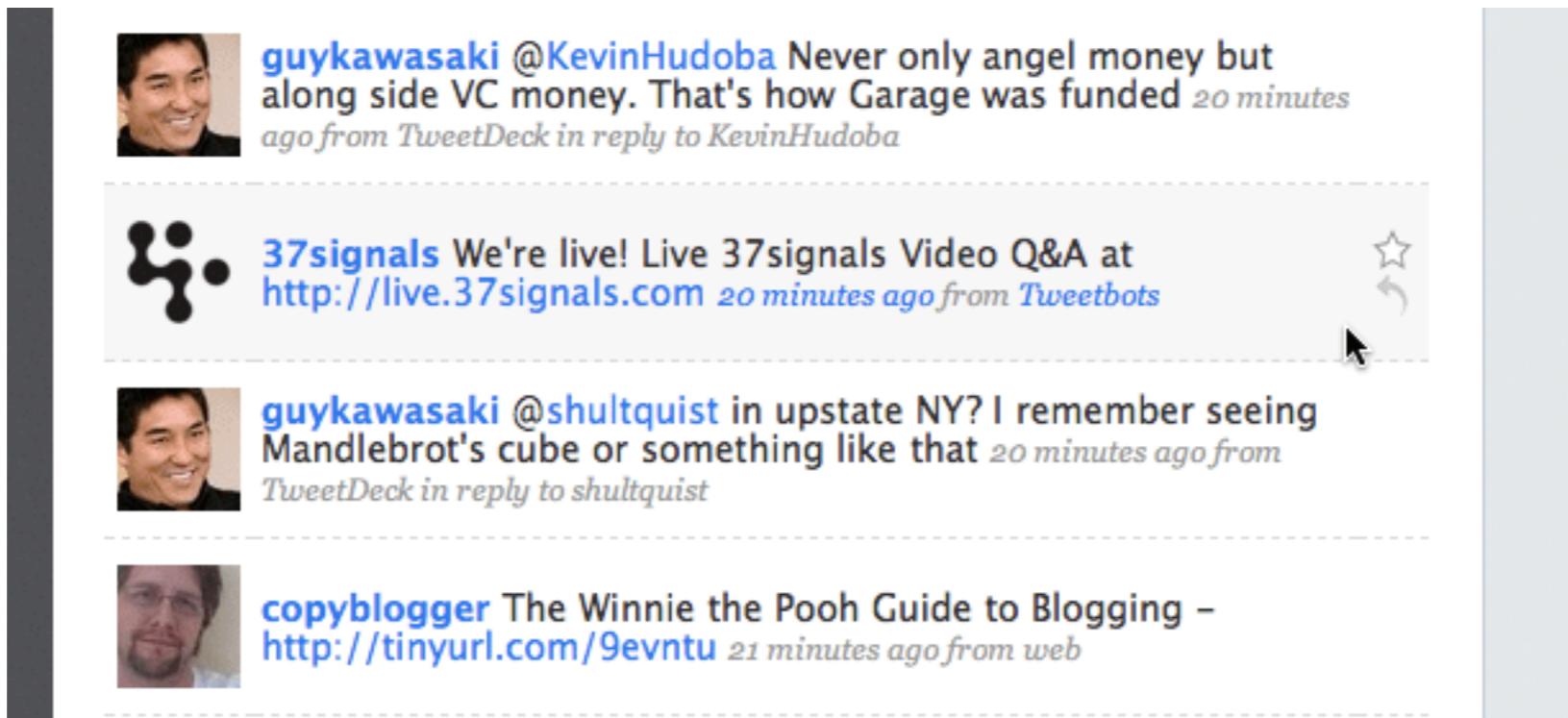


8. Aesthetic and minimalist design



8. Aesthetic and minimalist design

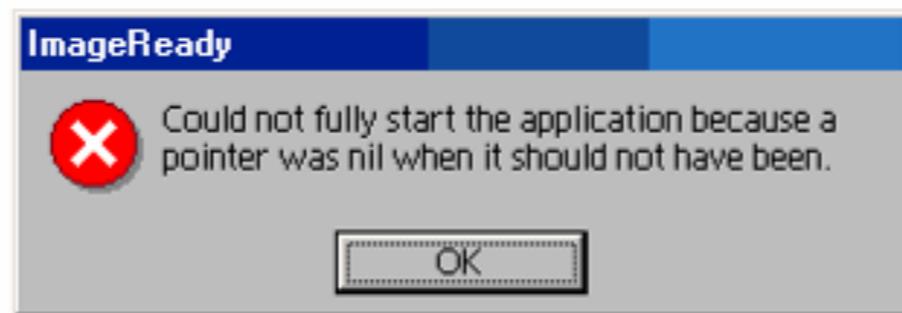
- Hover controls only appear when they are likely to be used (i.e. when the mouse is hovering over the activation area).



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

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

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



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

- Provide suggestions/examples
- Restate the user's input
 - Not “cannot open the file”, but “cannot open file named bla.doc”

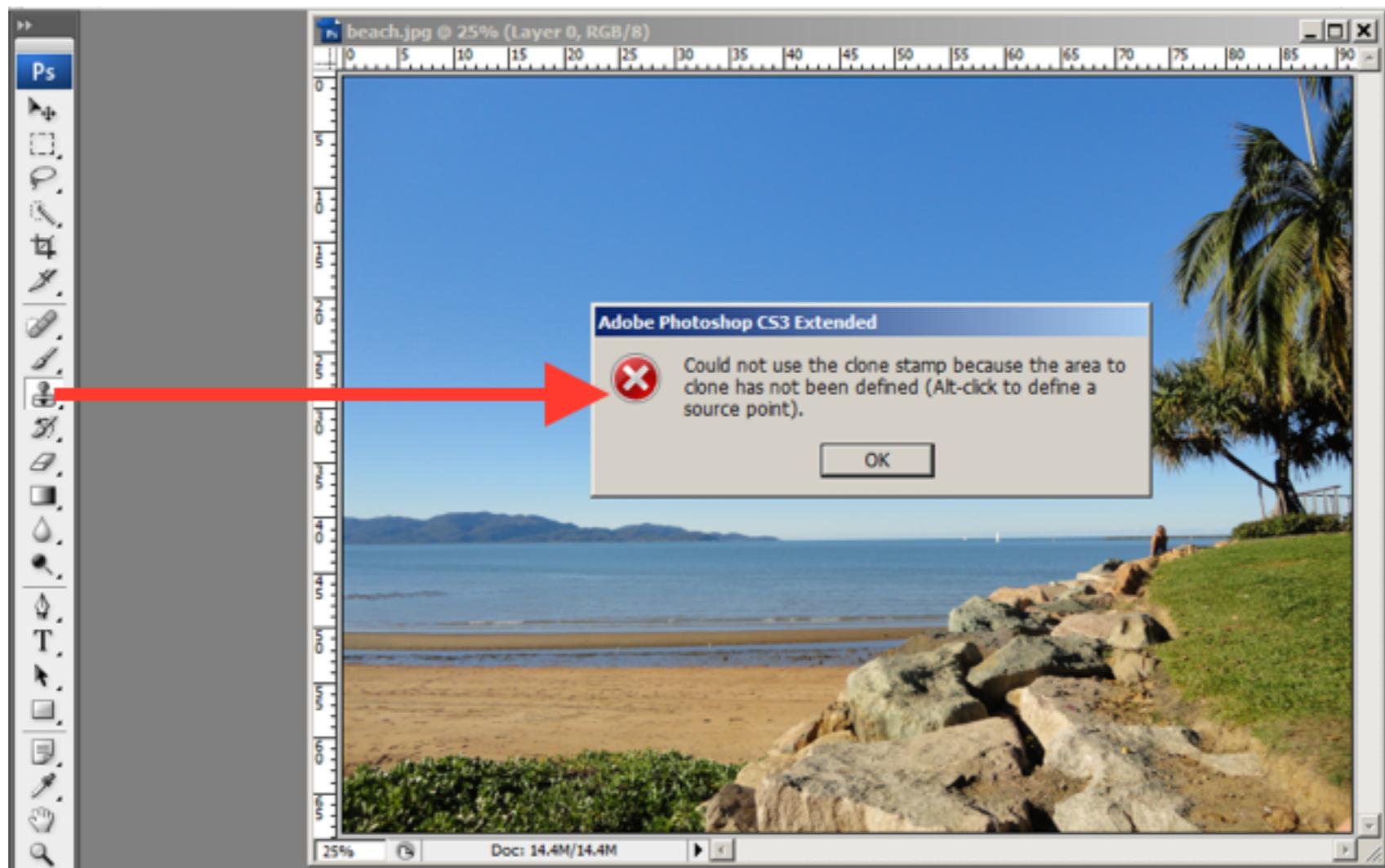
! Please enter your email address in this format: "youremail@domain.com".

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

- Be polite, don't blame



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



10. Help and documentation

- Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

10. Help and documentation

- Simple example: width of the field provides a clue about the length of the input.
- Contextual help is provided.

Date of birth

RID Number

Date of birth

e.g. 1/1/1990

RID Number (?)

10. Help and documentation

What constitutes help?

- Tutorials / get started manuals
- Reference manuals
- Reminders
- Wizards
- Tips

Conducting a Heuristic Evaluation

Conducting a Heuristic Evaluation

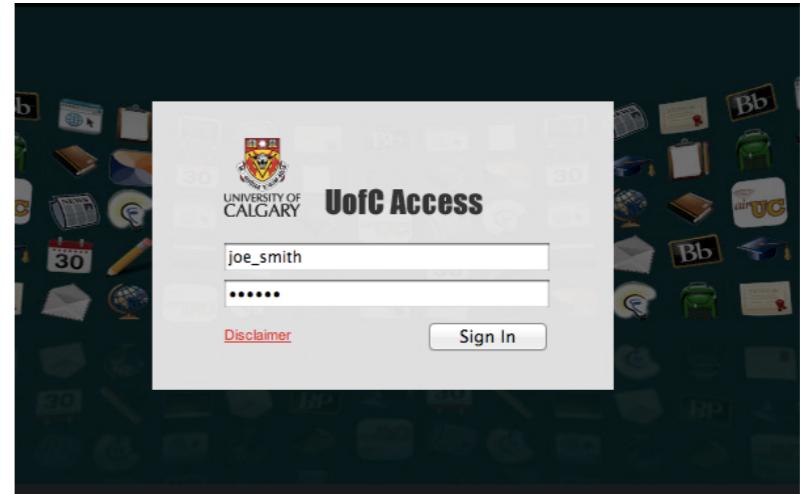
- **Pre-evaluation training**
 - provide evaluators with domain knowledge and information on scenario
- **Evaluation**
 - individuals evaluate and then aggregate results
- **Severity ratings**
 - determine how severe each problem is (priority)
 - perform individually then as a group
- **Debriefing**
 - discuss outcome with design team

Conducting a Heuristic Evaluation

- **Each evaluator performs at least two passes**
 - first: get a feel for flow and scope of system
 - second: focus on specific elements
- **Assistance:** for walk-up and use interfaces, no need; otherwise, supply evaluators with scenarios
- **Each evaluator produces a list of problems**
 - explain why with respect to the heuristics or other information
 - be specific and list each problem separately

Conducting a Heuristic Evaluation

- **Example**
- Tabbing from password field lands in “Disclaimer” link rather than “Submit”
 - Violates “consistency” heuristic, as well as “accelerators” heuristic
 - Fix: reorder the tab stops



Heuristic Evaluation

- Why list each violation?
- Where problems may be found
 - Single location in UI
 - Two or more locations that need to be compared
 - Overall structure of UI
 - Something that is missing
 - Hard with paper prototypes

Heuristic Evaluation

- **Severity Rating**
- Used to allocate resources to fix problems. Combination of:
 - Frequency
 - Impact
 - Persistence (one time or repeating)
- Should be estimated after all problems have been seen
- Independently first is good

Heuristic Evaluation

- **Severity Rating**

0 – don't think this is a usability problem

1 – cosmetic problem

2 – minor usability problem

3 – major usability problem; important to fix

4 – usability catastrophe; must fix

Heuristic Evaluation

- **Debriefing**
 - Conduct with evaluators, observers, and development team members
 - Discuss general characteristics of UI
 - Suggest potential improvements to address major usability problems
 - Dev. team rates how hard things are to fix
 - Make it a brainstorming session
 - Little criticism until end of session

Acknowledgements

- Tony Tang
- Lora Oehlberg
- Ehud Sharlin
- Frank Maurer
- Saul Greenberg

Course information

- Website
 - GitHub Pages <https://silvadasilva.github.io/CPSC481-2019S/>
- Communications
 - Slack <https://cpsc481-2019s.slack.com/>
- Readings and Slides
 - Posted online at the main website