EBU5305

Interactive Media Design and Production

Usability Evaluation

Usability

• Much of what we have discussed about design is concerned with making systems more usable.

• Usability can be defined as follows:
  ○ Usability is the study of the ease with which people can employ a particular tool or other human-made object in order to achieve a particular goal.
  ○ for example, in human-computer interaction and computer science, usability studies the clarity with which the interaction with a computer program or a web site (web usability) is designed.

• The primary notion of usability is that an object designed with a generalized users' psychology and physiology in mind is, for example:
  ○ More efficient to use — it takes less time to accomplish a particular task
  ○ Easier to learn — operation can be learned by observing the object
  ○ More satisfying to use

Heuristic evaluation

- Developed by Jakob Nielsen
- Helps find usability problems in a User Interface (UI) design
- Small set of evaluators used to examine UI (from 3 to 5)
  - Each checks for compliance with usability principles - *heuristics*
  - Use multiple evaluators as each will identify different problems
- At end of session problems are compiled and used to inform re-design

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Set of usability heuristics

- 1: visibility of system status
- 2: match between system and real world
- 3: user control and freedom
- 4: consistency & standards
- 5: error prevention
- 6: recognition rather than recall
- 7: flexibility and efficiency of use
- 8: aesthetic and minimalist design
- 9: help users recognize and recover from errors
- 10: help and documentation

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Usability heuristics

- **Meet expectations**
  - (H2) Match the real world
  - (H4) Consistency & standards
  - (H10) Help & documentation
- **User is boss**
  - (H1) Visibility of system status
  - (H3) User control & freedom
  - (H7) Flexibility & efficiency
- **Errors**
  - (H5) Error prevention
  - (H6) Recognition, not recall
  - (H9) Error reporting, diagnosis, and recovery
- **Keep it simple**
  - (H8) Aesthetic & minimalist design

5

List of heuristics with descriptions and examples.*

HEURISTIC	NIELSEN'S DESCRIPTION	EXAMPLE
Visibility of System Status	The system should always keep the user informed about what is going on, through appropriate feedback within reasonable time.	A progress bar displayed in a Web browser that indicates the status of a file download.
Match Between System and the Real World	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.	An "envelope" icon to represent e-mail.
Consistency and Standards	The user should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.	The "X" button in the upper right-hand corner of a window (Microsoft Windows–based systems, Redmond, Wash.).
Esthetic and Minimalist Design	Do not include information that is irrelevant and/or rarely needed.	Elimination of purely decorative, non–task-related visual elements in the interface.
Recognition Rather Than Recall	Minimize user memory overload by making objects, actions and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for using the system should be visible or easily retrievable whenever appropriate.	The input mask "dd/mm/yyyy" in a date entry field, instead of a blank field.

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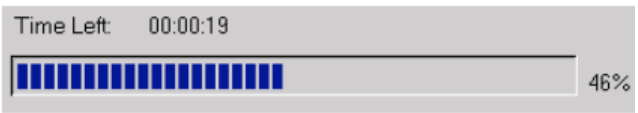
1. Visibility of system status

- keep users informed about what is going on
- Example: pay attention to response time
  - 0.1 sec: no special indicators needed
  - 1.0 sec: user tends to lose track of data
  - 10 sec: max. duration if user to stay focused on 1 action
  - for longer delays, use percent-done progress bars



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2. Match to real world

- speak the users' language
- follow real world conventions

Mac desktop

– Dragging disk to trash
should delete it, **not eject it**

User Control and Freedom	After choosing a system function by mistake, the user needs a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support "undo" and "redo."	The "undo" command to reverse the last action or sequence of actions.
Error Prevention	Even better than good error messages is a careful design that prevents problems from occurring in the first place.	Mechanisms that prevent obvious errors, such as entering a date in the past when making a patient appointment.
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.	Avoiding error messages that provide information only useful to system developers or programmers (such as "HTTP 404 error" in a Web browser).
Help and Documentation	Help and documentation should be available, concise, concrete, specific, easy to search and focused on the user's task.	Context-sensitive help accessible through a function key.
Flexibility and Efficiency of Use	Provide shortcuts for the expert user. Accelerators—unseen by the novice user—often may 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.	Providing the key combination "CTRL-C" as a way to copy the current selection.

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3. User control and freedom

- "exits" for mistaken choices, undo, redo
- don't force down fixed paths

- *e.g. Wizards*
  - must respond to question before going to the next (forced down fixed path)
  - OK for infrequent tasks
    - *e.g. modem configuration*
  - not so good for common tasks
  - Good for beginners

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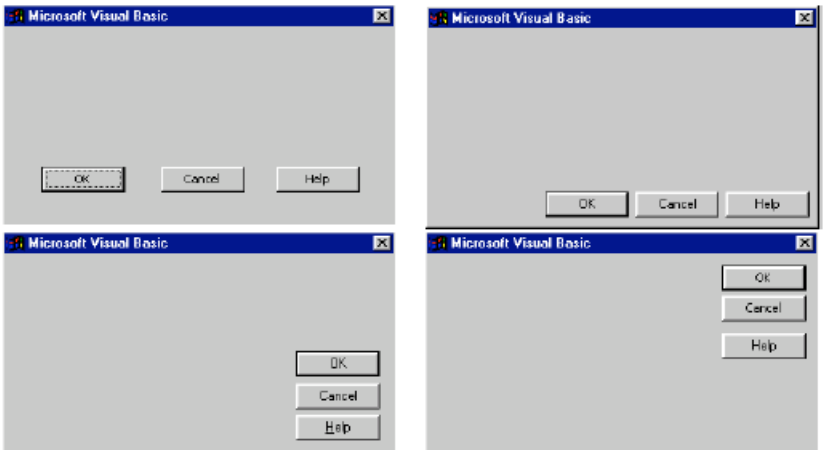
4. Consistency and standards

- consistency within **and between applications**



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5. Error prevention

- *e.g. if PIN is 4 digits, only allow 4 numeric* characters to be entered

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Consider the following usability problem

***Occasionally, the web site does not allow you to go back to the previous page*.**

Which of the five heuristics below characterises best this problem?

1. Visibility of system status
2. Match between system and real world
3. User control and freedom
4. Consistency and standards
5. Error prevention

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Consider the following usability problem

***Buttons have different labels on different pages, but they always perform the same sort of actions*.**

Which of the five heuristics below characterises best this problem?

1.Visibility of system status
2.Match between system and real world
3.User control and freedom
4.Consistency and standards
5.Error prevention

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Consider the following usability problem

There is no reminder before the time is out.

Which of the five heuristics below characterises best this problem?

1.Visibility of system status
2.Match between system and real world
3.User control and freedom
4.Consistency and standards
5.Error prevention

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Consider the following statement

Users shouldn't need to wait more than 2 seconds for a system's response.

Which of the five heuristics below is related to this statement?

1.Visibility of system status
2.Match between system and real world
3.User control and freedom
4.Consistency and standards
5.Error prevention

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Consider the following statement

Users generally prefer systems similar to those they learned already and dislike unfamiliar systems.

Which of the five heuristics below is related to this statement?

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2.Match between system and real world
3.User control and freedom
4.Consistency and standards
5.Error prevention

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Set of usability heuristics

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6. Recognition rather than recall

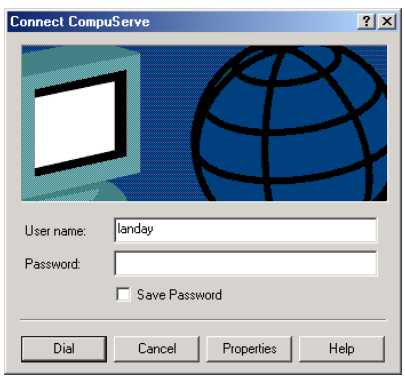
- make objects, actions, options, and directions visible or easily retrievable

Recall :

"What did you have for breakfast this morning?"

Recognition :

"Did you have toast or cereal for breakfast this morning?"



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User Control and Freedom	After choosing a system function by mistake, the user needs a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support "undo" and "redo."	The "undo" command to reverse the last action or sequence of actions.
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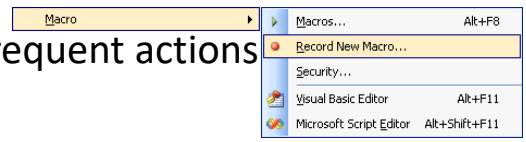
7. Flexibility for efficient use

- accelerators for experts
  - *e.g. keyboard shortcuts*

- allow users to tailor frequent actions
  - *e.g. macro commands*



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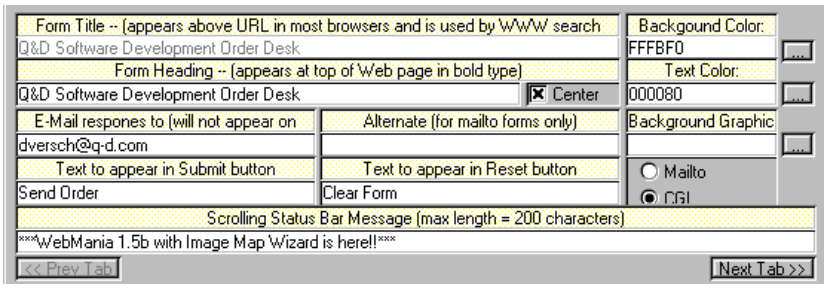
8. Aesthetic and minimalist design

- e.g. no irrelevant information in dialogues



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9. Help users recover from errors

Good Error Messages Should:

- Clearly indicate that something has gone wrong
- Be in a human-readable language
- Be polite and not blame the users
- Describe the problem
- Give constructive advice on how to fix the problem
- Be visible and highly noticeable, both in terms of the message and how it indicates where things went wrong
- Preserve as much of the user's work as possible so that they don't have to do everything over again
- If possible, guess the correct action and let users pick it from a list of fixes
- Educate users by providing links to pages with an explanation of the problem

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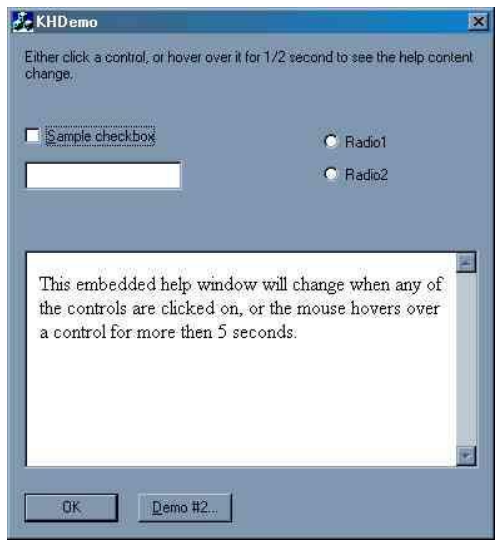
10. Help and documentation

- easy to search
- focused on the user's task
- list concrete steps to carry out
- not too large



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Consider the following usability problem

There is no search facility on the main page of the application.

Which of the five heuristics below characterises best this problem?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
4.Help users recover from errors
5.Help and documentation

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Consider the following usability problem

The front page contains too much information, and not all of it is useful.

Which of the five heuristics below characterises best this problem?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
4.Help users recover from errors
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Consider the following statement

Do not include information that is irrelevant or rarely needed.

Which of the five heuristics below is related to this statement?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
4.Help users recover from errors
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39

Consider the following statement

Users should be able to find the information they want within 3 mouse clicks.

Which of the five heuristics below is related to this statement?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
4.Help users recover from errors
5.Help and documentation

40

Consider the following statement

Humans' short term memory can retain only about 5-9 items at one time.

Which of the five heuristics below is related to this statement?

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4.Help users recover from errors
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Consider the following statement

The time required from a user to rapidly move the mouse to a target area, is a function of the distance to the target and the size of the target.

Which of the five heuristics below is related to this statement?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
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Consider the following statement

Minimise user memory overload by making objects, actions and options visible.

Which of the five heuristics below is related to this statement?

1.Recognition rather than recall
2.Flexibility for efficient use
3.Aesthetic and minimalist design
4.Help users recover from errors
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Heuristic evaluation

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- Small set of evaluators used to examine UI (from 3 to 5)
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Severity ratings

- Combination of
  - Frequency of problem
  - Impact of problem
  - Persistence of problem - one of or repetitive
- Calculate after evaluations complete
  - Each evaluator rates each problem
- Provides an indication of the need for more assessment and/or redesign

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Severity ratings

- 0 - don't agree that it is a usability problem
- 1 - it's a cosmetic problem
- 2 - minor usability problem
- 3 - major usability problem (important to fix)
- 4 - usability catastrophe (imperative to fix)

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Severity Ratings Example

The interface used the string "Save" on the first screen for saving the user's file, but used the string "Write file" on the second screen. Users may be confused by this different terminology for the same function.

→ [H4 Consistency] [Severity 3]

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Examples

- Can't copy data from one window to another
  - violates H7 "flexibility and efficiency of use"
  - Severity rating: 3
  - fix: allow copying

- Typography uses mix of upper and lower case formats and fonts
  - violates H4 "Consistency and standards"
  - slows users down
  - Severity rating: 2
  - fix: pick a single format for entire interface

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Questions

For each of the usability problems described below, select one corresponding heuristic and a severity rating:

- The placement of "Website terms and conditions" and "Privacy Policy" links has been reversed compared with the localisation page.
- The name of the system is displayed much too prominently.
- The main site logo on the top left of the page is clickable, so users may think that they are not already on the home page.
- The day/month/year date format may be misinterpreted by foreign tourists.
- The choices in the localisation menu may be too restrictive - for example, it is unclear what option to choose if you are in China but you speak English.

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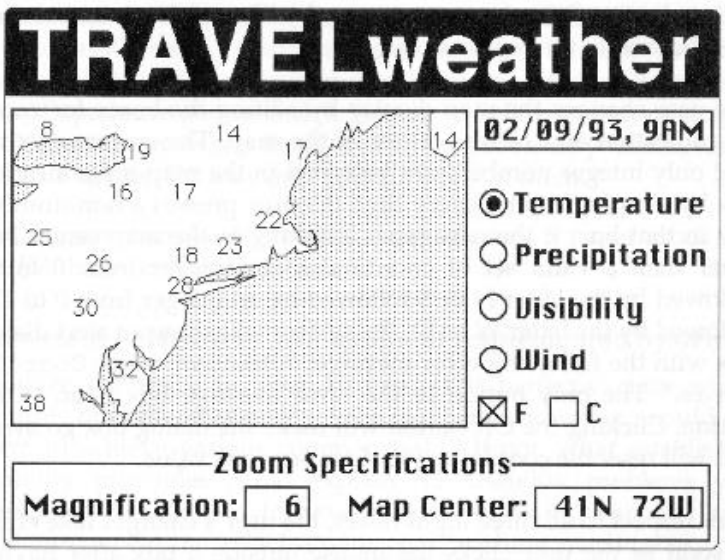
Exercise



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