HEURISTIC EVALUATION OF USABILITY

Human Computer Interaction
Interação Pessoa Máquina

General Information

- Heuristics are collections of rules and guidelines aimed to help designing good user interfaces

- Traditionally quite large collections
  - Brown 1988: 302 rules
  - Smith & Mosier 1986: 944 rules

General Information

- Sets of hundreds of rules are inpractical for heuristic evaluation
- Designers abandon rules and rely on their intutition
- Nowadays lighter methods have become used
  - Nielsen
  - Schneiderman

Nielsen's Heuristics

- Nielsen published an update at 2005
- Nowadays Nielsen's principles are often connected to Web usability
- Nielsen has been criticized for being too puritanic

Heuristic evaluation

- Developed Jacob Nielsen in the early 1990s.
- Based on heuristics distilled from an empirical analysis of 249 usability problems.
- These heuristics have been revised for current technology.
- Heuristics being developed for mobile devices, wearables, virtual worlds, etc.
- Design guidelines form a basis for developing heuristics.

General Information

- Heuristics can be applied to either finished product or prototypes
- Evaluation of prototypes is useful
  - Errors are found at early stages
  - Money and time are saved
- Even crude prototypes provide useful information

General Information

- Heuristics are often applied in an iterative fashion
  - Evaluation session
  - Errors are found
  - Error are corrected
  - Back to evaluation until results are of satisfying quality

General Information

- According to Nielsen a single evaluator is able to find ~ 35 % of usability problems
- Therefore is necessary to use several persons to evaluate a product
- Amount of problems found increases rapidly when five evaluators are used instead of one

General Information

- When more than one evaluators are used
  - each one goes trough interface
  - after all evaluators have finished a summary is produced
  - no discussions between evaluations prevents evaluators for getting stuck in earlier findings/ opinions

General Information

- A result of heuristic evaluation is a list of weaknesses and errors
- Each problem must be connected to a specific heuristic rule
- Evaluator can be either a trained person or a heuristics specialist
- A specialist finds usually considerably more errors than an untrained person

Nielsen's Rules

- Nielsen's rules are probably the most commonly used in heuristic evaluation
- Exact format of rules may vary slightly according to a source
- The original set of rules was published 1990

Nielsen's Rule # 1 (H1)

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

Nielsen's Rule # 1 (H1)

- E.g. WWW forms should be able to immediately inform the user of misfilled fields
- Error messages should vanish from screen after error has been corrected
- If a task takes a long time, a task progress indicator should be used to inform the user

Nielsen's Rule # 2 (H2)

- 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

Nielsen's Rule # 2 (H2)

- Familiarity with potential user groups is essential

- Limitations, like 8 character filenames, are harmful

- Metaphors should be used in a way that corresponds to the user's world

Nielsen's Rule # 3 (H3)

- 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

Nielsen's Rule # 3 (H3)

- User must not get trapped inside an application

- If possible, a multi level undo/redo should be implemented

- If an operation takes more than 10 seconds, the user should be able to cancel it

Nielsen's Rule # 4 (H4)

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

Nielsen's Rule # 4 (H4)

- UI should be consistent troughout application
- E.g. layout of UI components should not change
- Especially shortcuts, like keyboard combinations, should remain the same
- Style guides should be produced and used

Nielsen's Rule # 5 (H5)

- 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 the action

Nielsen's Rule # 5 (H5)

- E.g. typing errors are commonly made => user can choose files from a list instead
- Often different modes of programs are origins of errors
  - E.g. insert/normal mode of a text editor
  - Users should be clearly informed about mode currently used

Nielsen's Rule # 6 (H6)

- 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. Instructions for use of the system should be visible or easily retrievable whenever appropriate

Nielsen's Rule # 6 (H6)

- Short term (7 +/- 2) memory should not be overloaded
- If possible, use computer's memory capacity instead of user's
- E.g. when an input of certain format is expected, show the correct format to the user

Nielsen's Rule # 7 (H7)

- 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

Nielsen's Rule # 7 (H7)

- Many modern applications offer many possibilities for tailoring of UI
- UIs can be of an adaptive kind
  - User's actions are observed
  - UI automatically adjusts itself to the most suitable form
- UIs could, for example, automatically progress from novice level to expert level

Nielsen's Rule # 8 (H8)

- 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.

Nielsen's Rule # 8 (H8)

- New versions of applications include more and more features

- In practice 80 % of users use only 20 % of features

- Users are overwhelmed with information (feedback)

Nielsen's Rule # 9 (H9)

- 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.

Nielsen's Rule # 9 (H9)

- Error messages can be used as explanations of application's conceptual model

- Expressions should be polite/neutral

- A possible solution can be, for example, guiding the user to contact support

Nielsen's Rule # 10 (H10)

- 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

Nielsen's Rule # 10 (H10)

- Documentations are used by users as a last resort
- Online docs may be better than printed ones
    - fast search functions
    - do not require a shift in eyesights focus
- Writing a good set of instructions is a demanding task

Heuristic evaluation: steps

- Briefing session to tell experts what to do.
- Evaluation period of 1-2 hours in which:
  - Each expert works separately;
  - Take one pass to get a feel for the product;
  - Take a second pass to focus on specific features.
- Debriefing session in which experts work together to prioritize problems.

HE: Advantages and problems

- Few ethical & practical issues to consider because users not involved.
- Can be difficult & expensive to find experts.
- Best experts have knowledge of application domain & users.
- Biggest problems:
  - Important problems may get missed;
  - Many trivial problems are often identified;
  - Experts have biases.

HE: How many users?
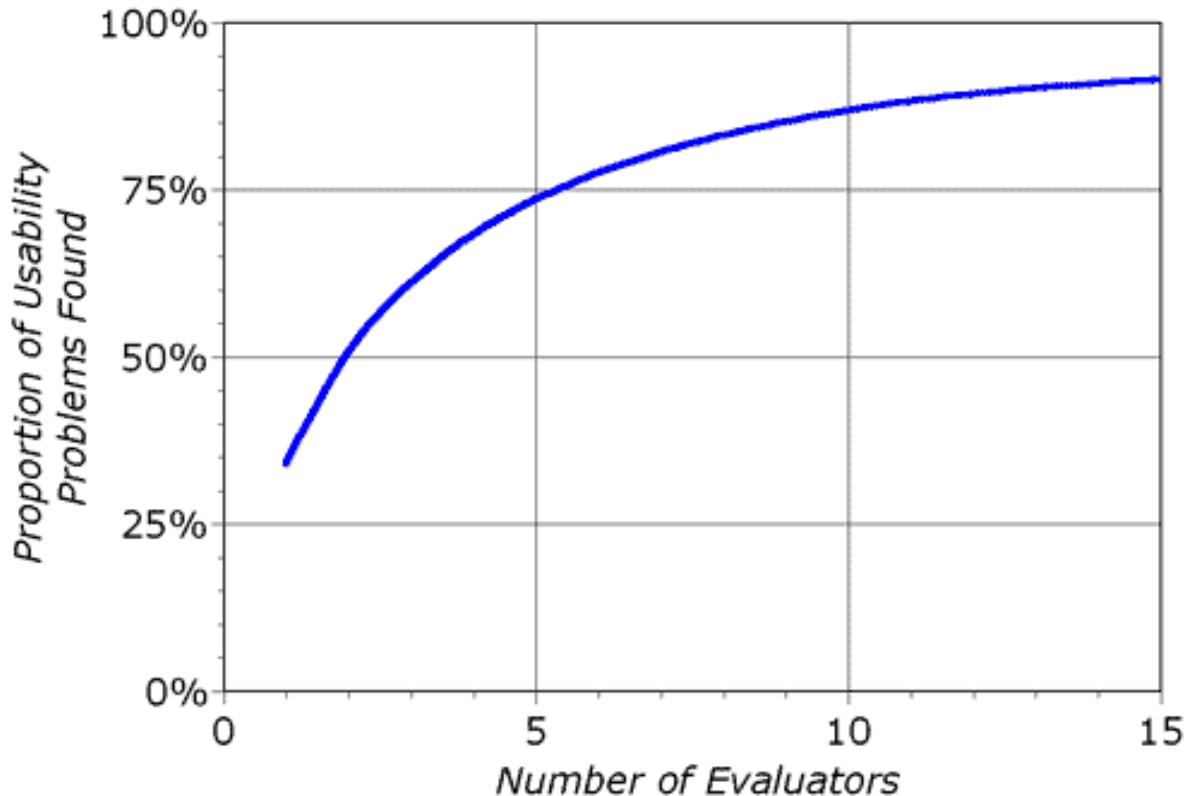
Empirical evidence suggests that five evaluators usually identify around 75% of total usability problems.

HE: How many users?
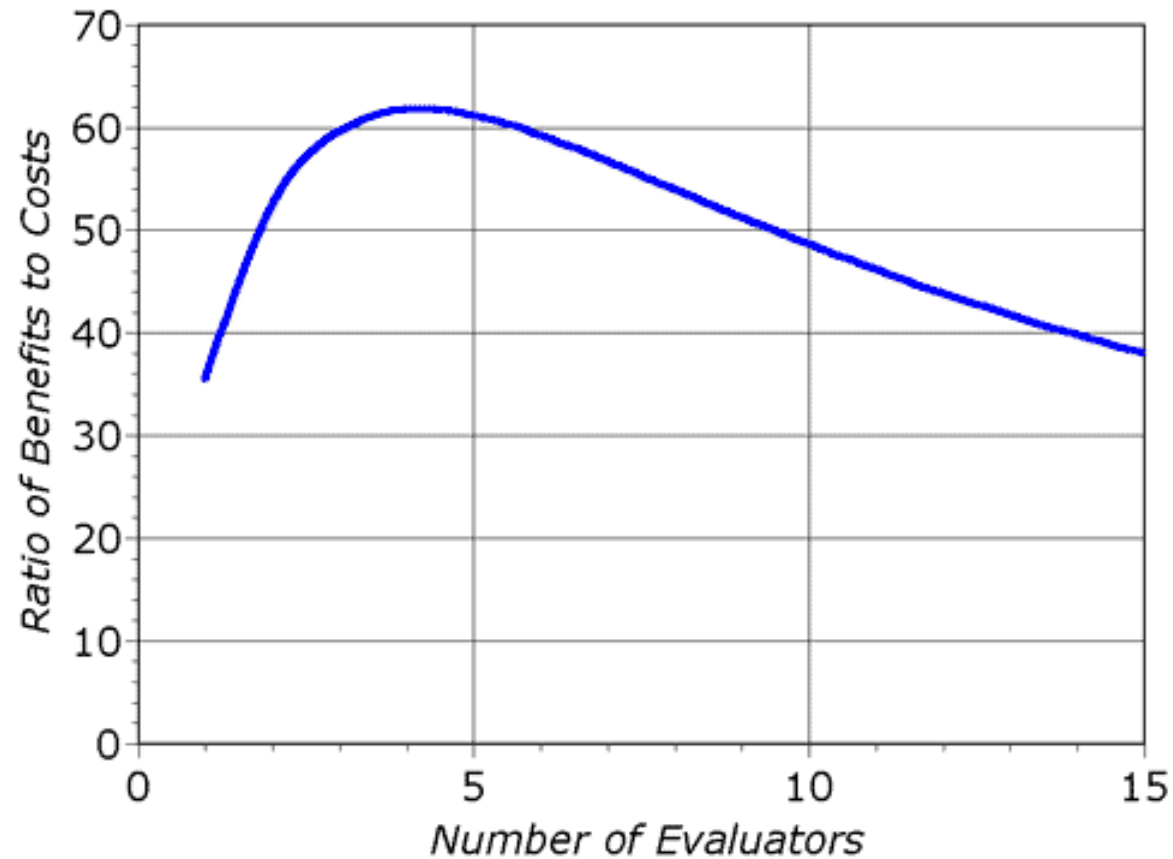
Heuristic evaluation

- Helps identify usability problems in UI
  - [Nielsen and Mohlich, 1990]

- HE = heuristics + procedure
  - about 5 evaluators
  - each evaluates UI against heuristics
  - rate severity of each issue
  - aggregate results
  - devise design solutions

Heuristic evaluation

- Briefing
  - teach to evaluators; ensure each person receives same briefing.
  - become familiar with the UI and domain

- Evaluation period
  - compare UI against heuristics
  - spend 1-2 hours with interface; minimal 2 interface passes
  - take notes

- Debriefing session
  - prioritize problems; rate severity
  - aggregate results
  - discuss outcomes with design/development team

Severity Ratings

- 0 – this is not a usability problem
- 1 – cosmetic problem only
- 2 – minor usability problem
- 3 – major usability problem
- 4 – usability catastrophe; imperative to fix

- Combination of frequency and impact

HE: (H1)

- User should clearly see effects of action
  - Obvious: do not hide or make results subtle
  - Immediate: within a few seconds
  - Valid: convey the right information
  - Persistent: show as long as it is needed
  - Speak the user's language

- Response times
  - want less than 500 ms
  - otherwise, use "reassurance" displays

HE: (H1)

- Dialog box moves out of the way

  But…

- How many more changes and where?
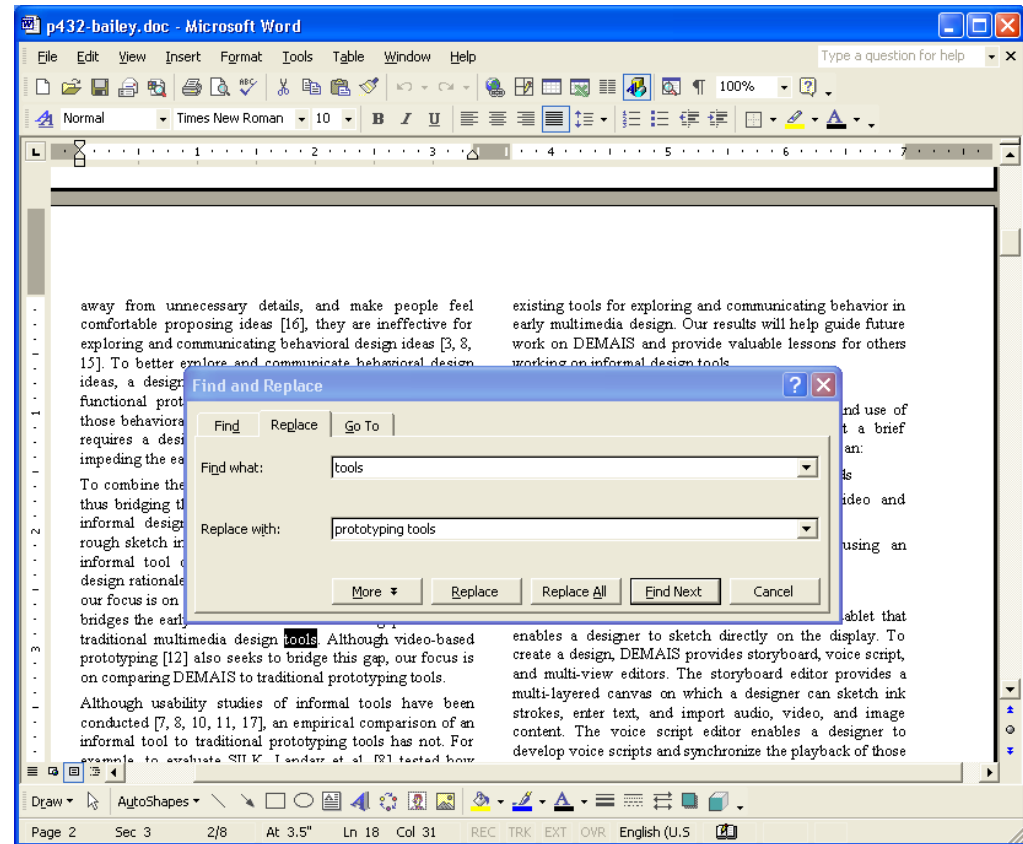
HE: (H2)

- Words and concepts from user's world
- Don't use specific engineering terms
- Focus on user's point of view

Bradley N Miller > Bookshelf

TO COMPUTING LITERATURE

Search Results

Nothing Found

Your search for **[interface user evaluation heuristic]** did not return any results.

You may also revise it and try your search again below or click advanced search for more options.

interface user evaluation heuristic

SEARCH [Advanced Search] [Search Help/Tips]

Complete Search Help and Tips

The following characters have specialized meaning:

Special Characters	Description
, ( ) [	These characters end a text token.
= > < !	These characters end a text token because they signify the start of a field operator. (! is special: != ends a token.)
` @ \Q < { [!	These characters signify the start of a delimited token. These are terminated by the end character associated with the start character.

HE: (H3)

- Don't trap users in a certain location

- Allow users to get back quickly and easily
  - support exploration
  - support undo consistently
  - support interruption of long-lived events

HE: (H4)

- Consistent with user's mental model
- Consistent with tasks
- Consistent with experience/expectations
- Consistent within and between apps
- Similar information in similar locations
- Use the same action sequence in different parts of the interface to get similar results

File   Edit   View   Favorites   Tools   Help

Back   Forward   Stop   Refresh   Home   Search   Favorites   Media   History   Print

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Back   Forward   Stop   Refresh   Home   Search   Favorites   Media   History   Print

Address http://www.wellsfargoadvantagefunds.com/html/welcome/search.htm   Go

WELLS FARGO   ADVANTAGE FUNDS

Home | About Us | Press Room | Policies & Conditions | Fund Holdings | Search

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Find results

with **all** of the words [   ] [10 results ▼]

with the **exact phrase** [   ]

with **any** of the words [   ]

without the words [   ]

[Search]

This Web site is accompanied by current prospectuses *for the* Wells Fargo Advantage Funds[SM] *and a* current program description *for EdVest[®]. Consider the investment objectives, risks, charges and expenses of the investment carefully before investing. This and other information can be found in* current prospectuses *for the* Wells Fargo Advantage Funds *and a* current program description *for* EdVest. *Please read it carefully before investing.*
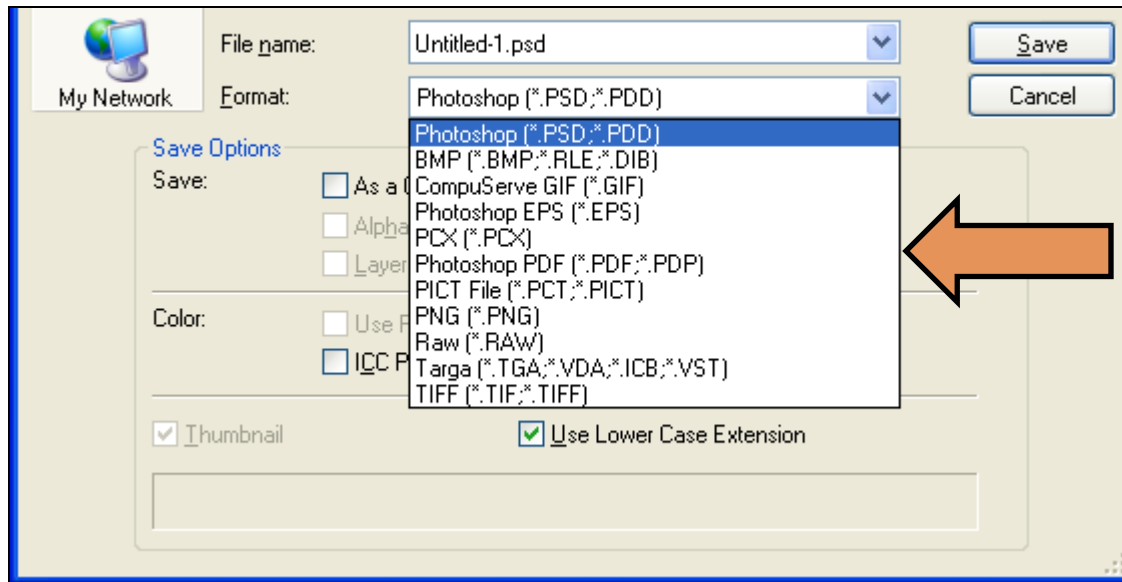
NOT FDIC INSURED • NO BANK GUARANTEE • MAY LOSE VALUE

HE: (H5)

- Scrutinize every error message
- Can the error be prevented?
  - allow recognition over recall when possible
  - confirm risky operations
  - avoid use of modes as much as possible
  - use clear status indicators
- Detect when error occurs
- Allow user to recover from the error

What happened to JPEG?

HE: (H6)

- Show range or sample inputs
- Use generic actions across application
- Don't make user remember things between actions
- Leave information on screen until not needed

File   Edit   View   Favorites   Tools   Help

Back | | Favorites | Media | Search | |

Address http://personal.fidelity.com/accounts/services/findaform.shtml | Go

Links | rary | ABC News | CNN | MarketWatch | Merriam-Webster OnLine | Google

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| **My Fidelity** | **Accounts & Trade** | **Quotes & Research** | **Planning & Retirement** | **Products** | **Customer Service** |

Sunday, September 21, 2003

Customer Service
Find a Form

Find a Form >

List By Category

List By Category

- Most Requested

- Alphabetical List

- Download Adobe®
  Acrobat®

Use Find a Form to quickly locate forms and instructions in the Customer Service area. You can search by category, most requested, or alphabetically by selecting your choice on the left.

- New Account Applications
- Account Features
- Retirement Account Forms
- Moving Money To/From Your Fidelity Account
- Account Mailings
- Making Changes to Your Account
- Tax and Legal Forms
- Giving Access to Someone Other Than Yourself
- Stock Plan Services Forms
- College Investing Plan (529) Forms
- Portfolio Advisory Service℠ Forms
- Annuity Forms

New Account Applications
Many new account applications can be completed online. In some situations you can open your brokerage account online and receive your account number today. If you prefer to apply by mail,
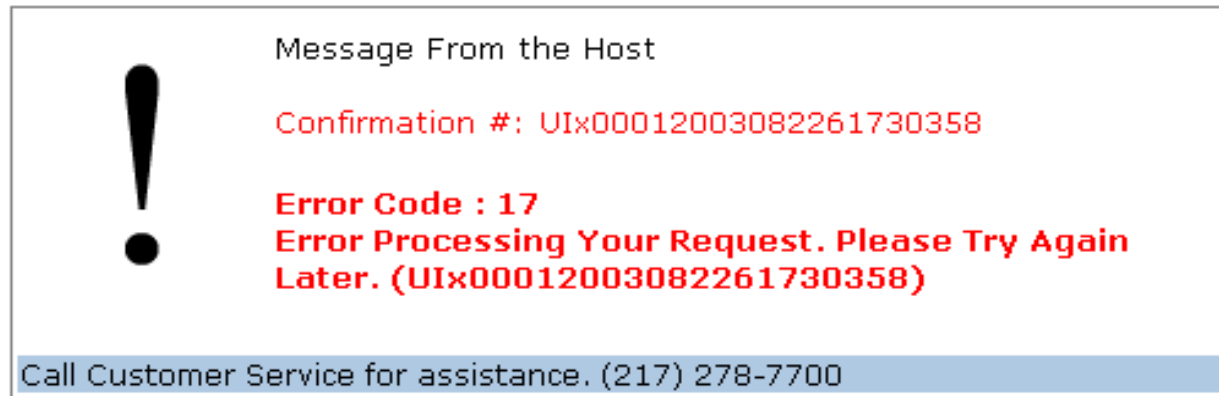
Internet

HE: (H7)

- Help experienced users avoid long dialogs or messages that they don't need

- Strategies include:
    - type- and click-ahead
    - keyboard shortcuts
    - good default values
    - macros and scripting
    - reuse/edit history
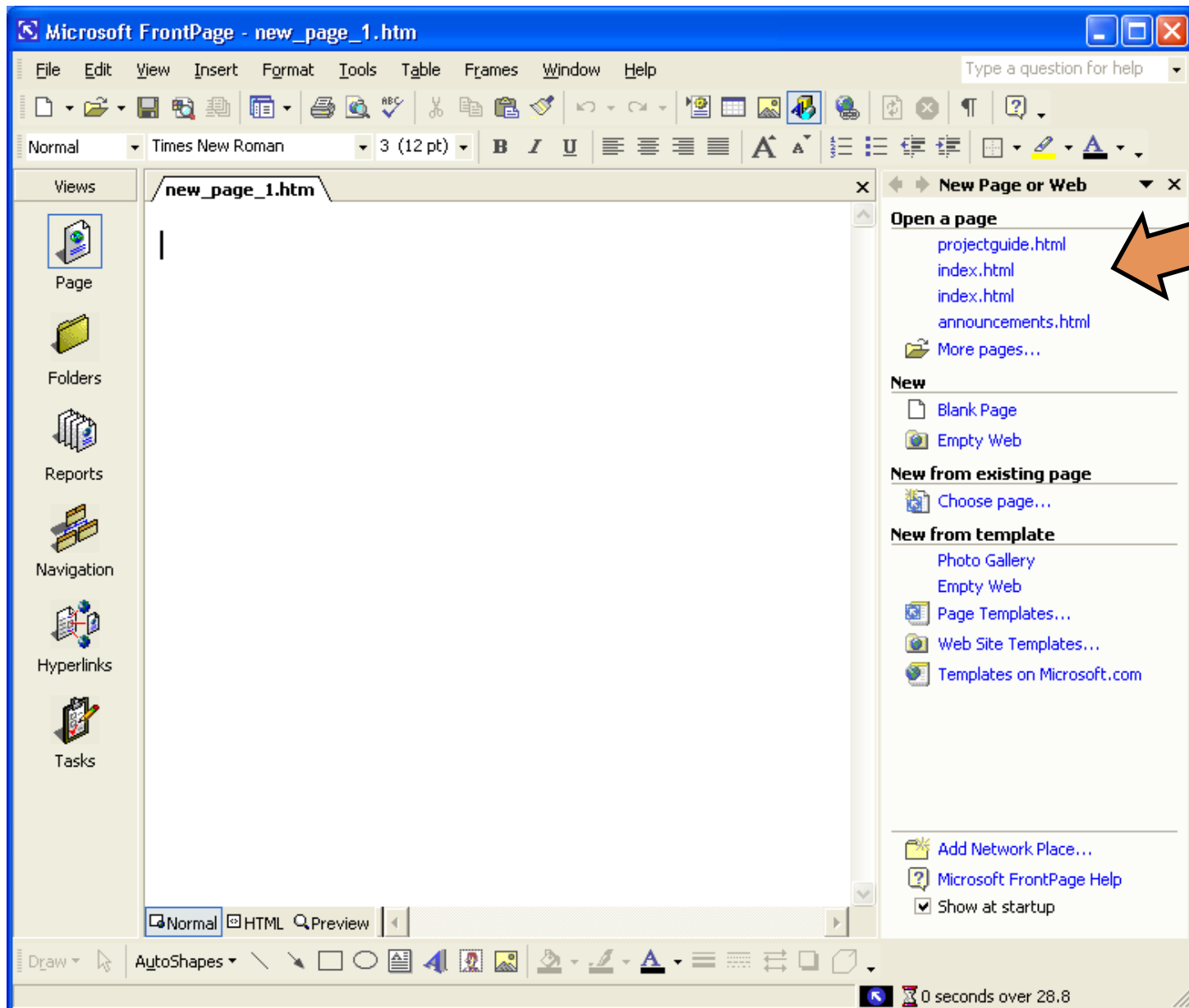
HE: (H9)

- Clear and in simple language
  - user can dig deeper to get obscure details

- State the problem / suggest solutions
  - give links to the solutions, if possible

- Use a positive, non-accusatory tone

- Graceful error behavior

Message From the Host

Confirmation #: UIx00012003082261730358

Error Code : 17
Error Processing Your Request. Please Try Again
Later. (UIx00012003082261730358)

Call Customer Service for assistance. (217) 278-7700

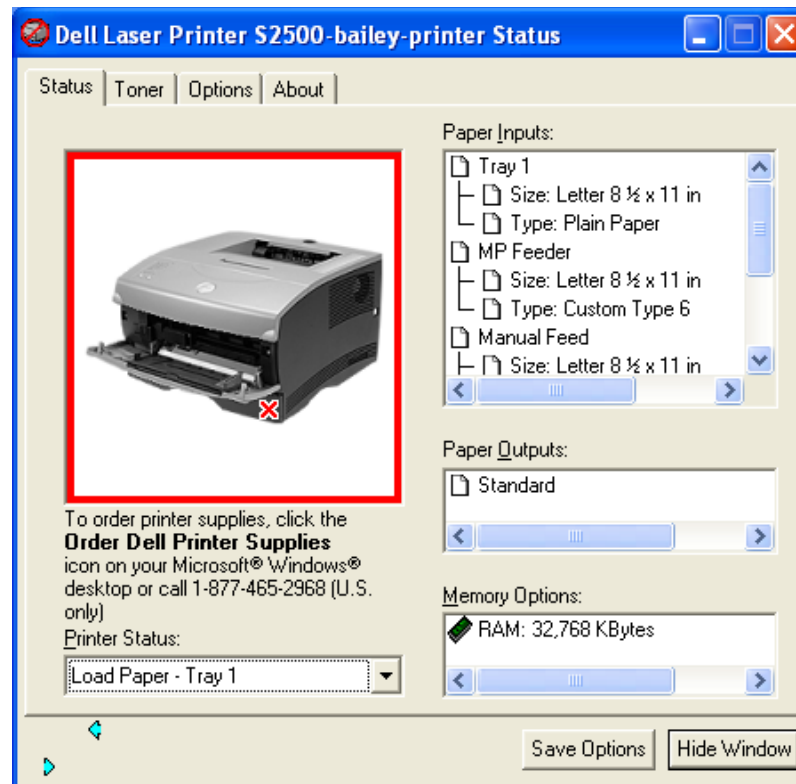OK

UIECU - server error

Negative tone

Useless error codes

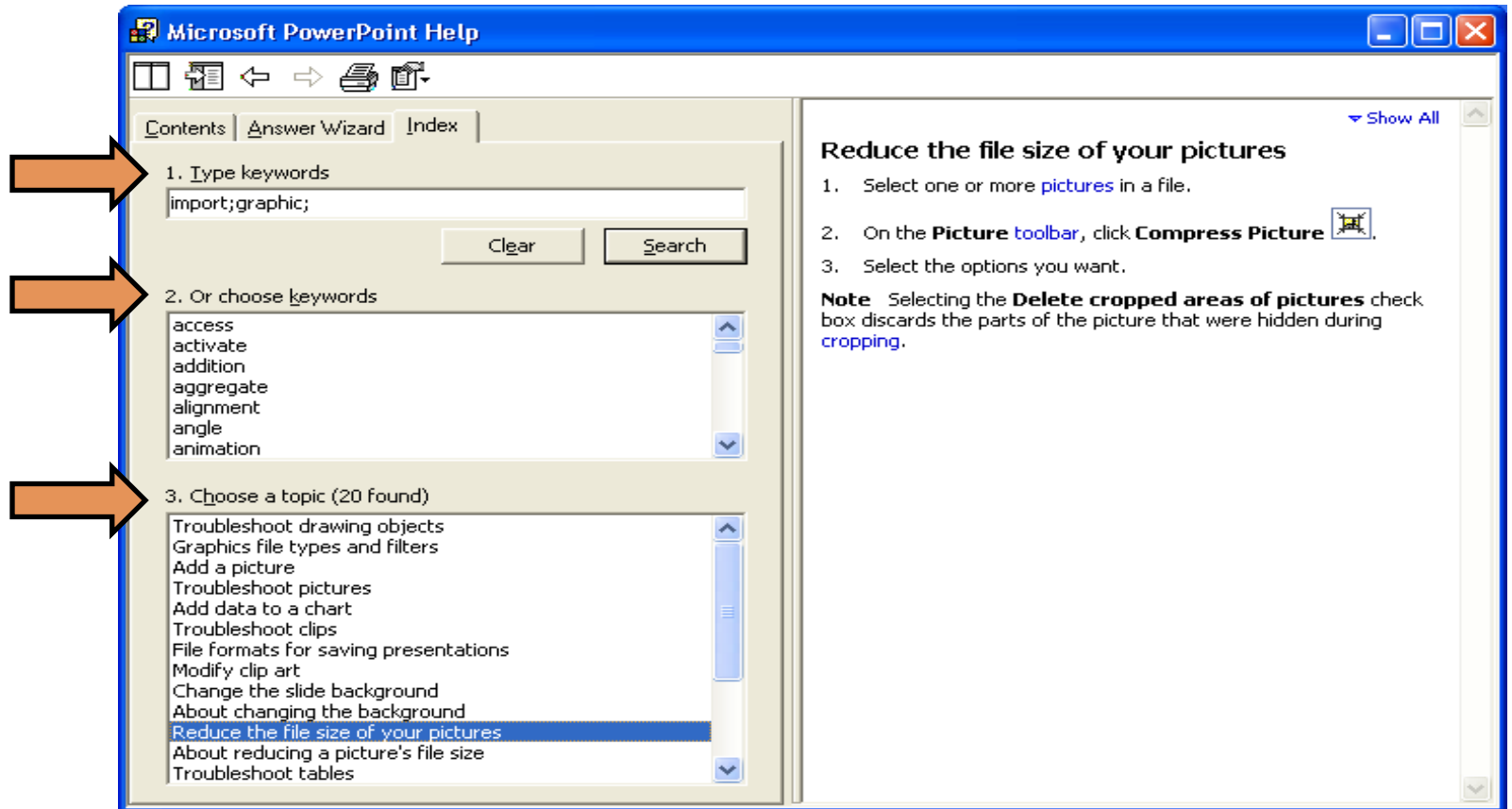Printer error - what's wrong?

HE: (H10)

- Best if system can be used w/o manuals
  - but may not be possible

- Documentation should be
  - easy to search
  - focused on the user's task
  - list concrete steps to be carried out

HE – Pros and Cons

- Pros
  - Very cost effective
  - Identifies many usability issues

- Cons
  - Relies on interpretation of guidelines
  - Guidelines may be too generic
  - Needs more than one evaluator to be effective