



Universidade de Aveiro  
Departamento de Electrónica,  
Telecomunicações e Informática

# Usability Evaluation – Lab classes



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Any kind of testing is better than no testing



- Usability is, according to ISO 9241-11:  
  
“the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”
- How to measure it??



- Analytical (without users)
    - Heuristic Evaluation 
    - Cognitive Walkthrough
    - Model based methods
    - Review methods
    - ...
  - Empirical (involving users)
    - Observation
    - Query
    - Controlled Experiments
    - ...
    - usability tests 
- (  - we are going to use)



- Bad UI examples:

<http://hallofshame.gp.co.at/shame.htm>

# Heuristic Evaluation





- A “**discount usability engineering method**” for quick, cheap, and easy evaluation of a UI design
- Most popular usability inspection method; yet is **subjective**
- It is a **systematic inspection** of a design for usability
- Meant to find the usability problems in the design so that they can be attended to as part of an iterative design process
- Involves a small set of analysts judging the UI against a list of usability principles (“**heuristics**”)



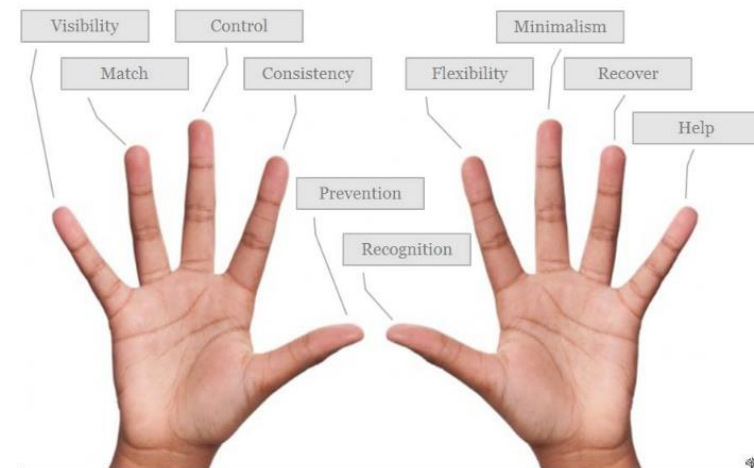
- **Advantages:**
  - Quick
  - Cheap
  - Easy
- **Disadvantages:**
  - Subjective (expert dependent)
  - May be hard to find experts
  - Not always easy to perform user role (children, doctors, elders, etc...)
- Minimize problems using more than one expert.



# Heuristic Evaluation (Nielsen and Molich 1990)



- Nielsen proposed **10 general usability heuristics**, yet **there are other sets**  
(e.g., for web, mobile, visualization applications, for seniors or children...)
- More details on how to conduct a heuristics evaluation at:  
<https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/>
- And how to rate the severity of the usability problems found:  
<http://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/>
- The list of problems and severity rates should help the development team to prioritise problem fixing**





- <https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/>
- Question: How many expert should be used?

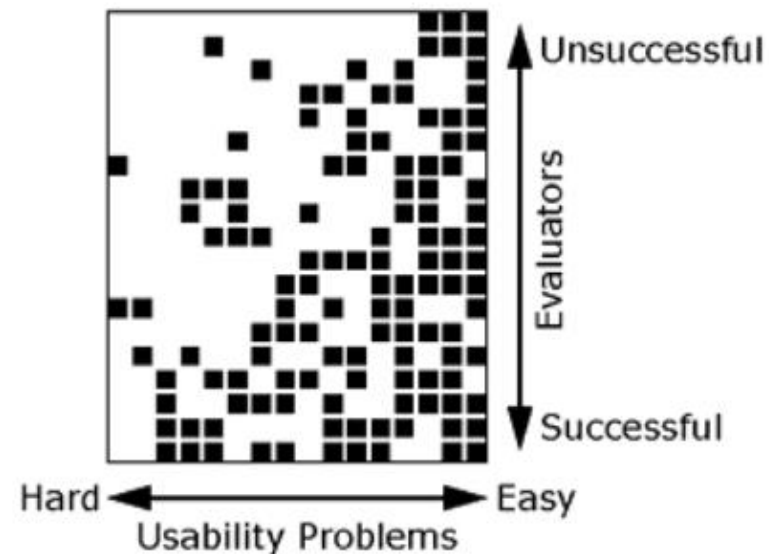


## Example: “the magic number five”

- Heuristic evaluation of a banking system:
  - 19 evaluators
  - 16 usability problems

black square - problem found  
white square – not found

<http://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation>



- Conclusion : **in general 3 to 5 evaluators seems reasonable, but be careful!**
- More evaluators find more problems but cost more

# List of recognized usability principles (“the heuristics”)



<https://www.nngroup.com/articles/ten-usability-heuristics/>

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Help and documentation





- **Consistency and standards**

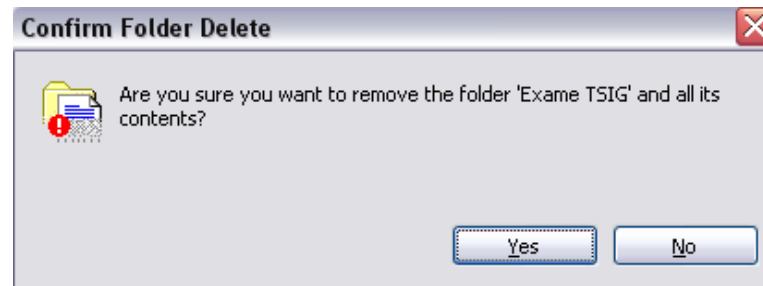
Nome:

Cod. Postal:

Idade:

Rua:

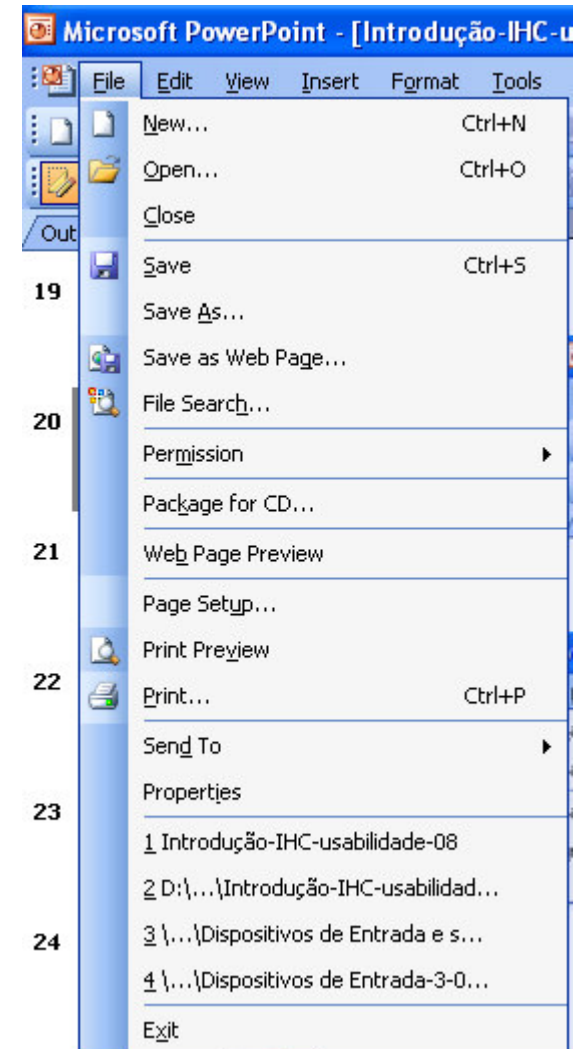
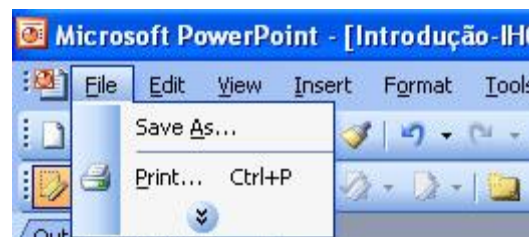
- Error prevention





- **Recognition rather than recall**

- Flexibility and efficiency of use





- Aesthetic and minimalist design





- Help users recognize, diagnose, and recover from errors

## 500 Internal Server Error

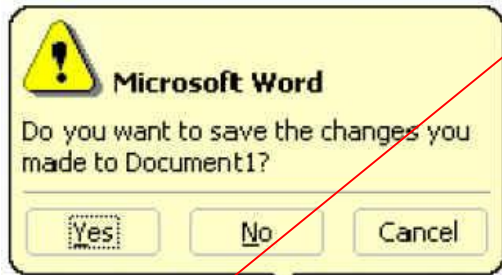
Sorry, something went wrong.

A team of highly trained monkeys has been dispatched to deal with this situation.

Also, please include the following information in your error report:

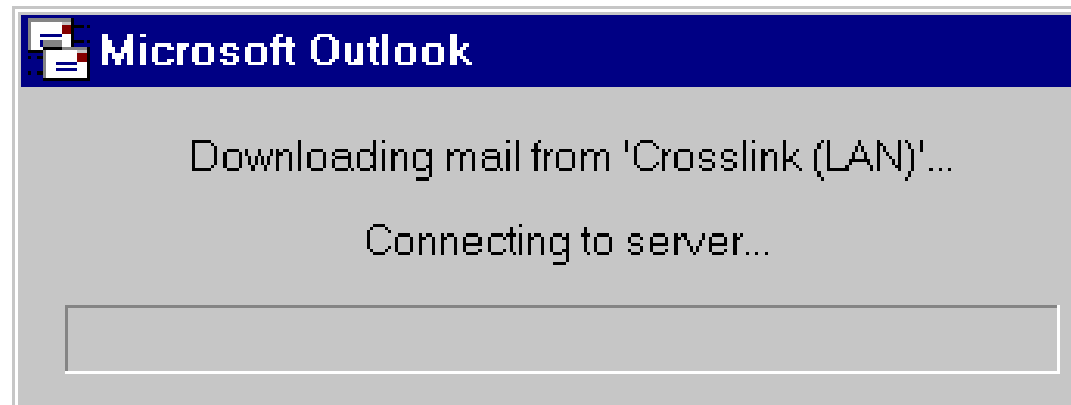
```
kPlWD0sPDIBMJUUh49VkmxtFpOZQ7IuVhbw5oznMcdQjbnGwFBPUVUCJ-3wY
xMw3oeNG0P9cIT2L6Jj2I0fnfnHPZ-YAc75LNWVaPKQ66x64-yyVE4oIGlIw
Rxa6wsxo3fExs1UfPqKWNxd4OznICPcj5k0wlw-gRejWGx9JowG1-ALEKkwB
HqfV70GRTrFqe40kTw4kVrhgW8cqbDqS2LG5NNQ9YvkXFNBUlJt90MabqfYw
7B6gXotg0ieYqd-xx8bYkbjGWqjl6jdPEk7_xvBFlag2Vg1lxJPD0R-Q3smB
pWzslhYtKlukxu_K6tGVPadITM4aRVHWZXW43UDAg9sY7AZQOITc--alf8Cj
```

- Help and documentation

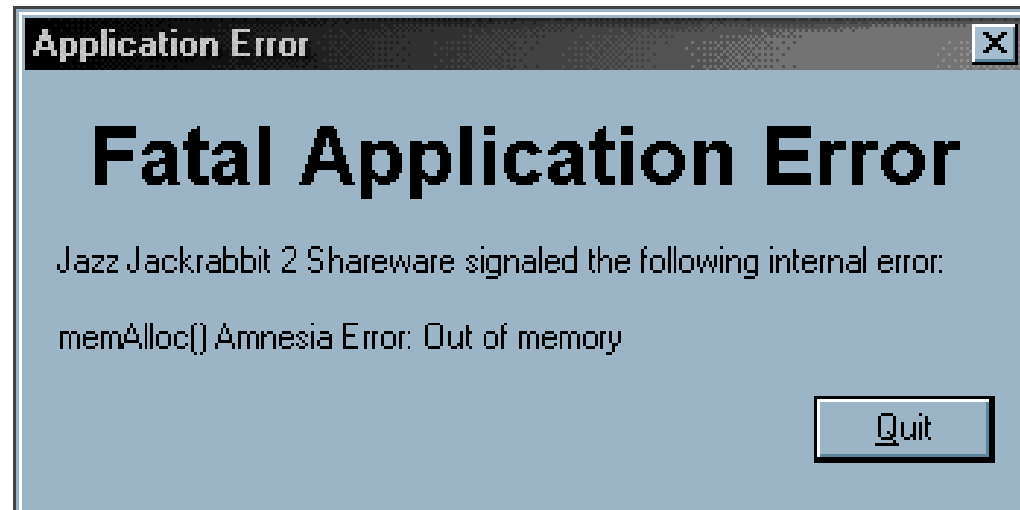


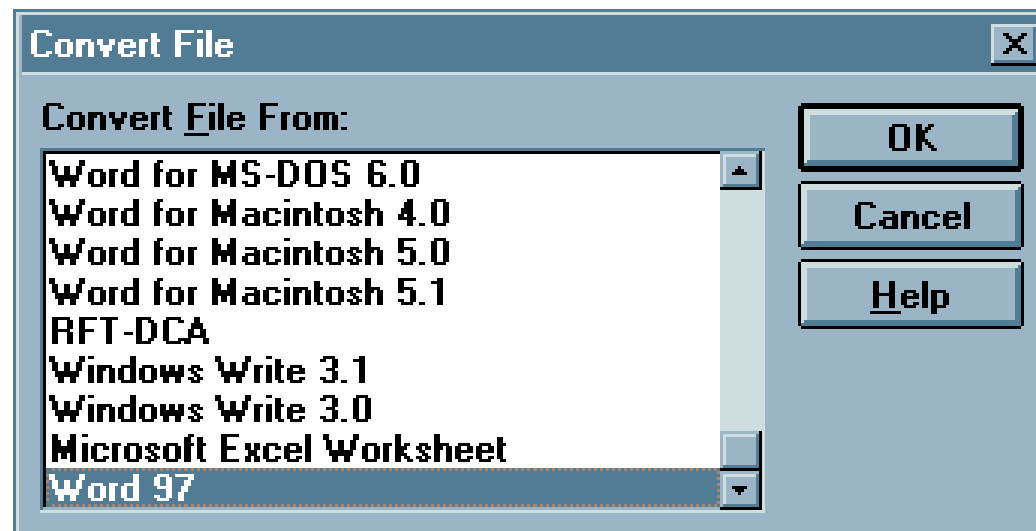


- Find UI problems and classify according to Heuristics
- <http://hallofshame.gp.co.at/shame.htm>



Progress bar on/off!






# Recognition rather than recall



Program Flags

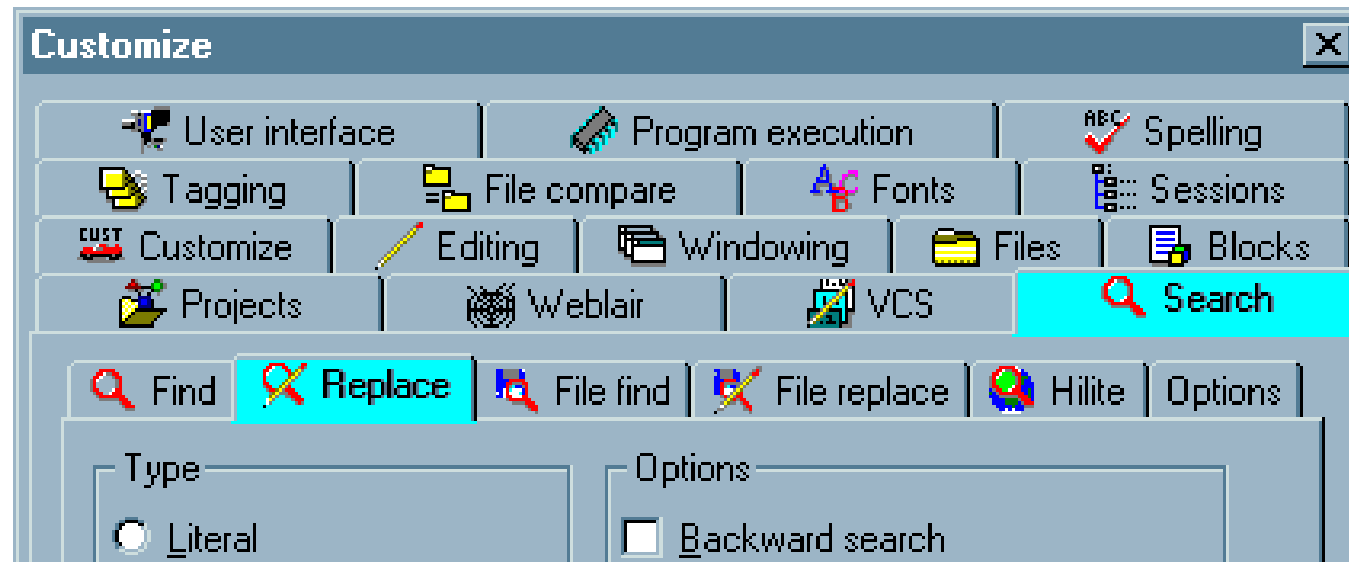
<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 5	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 7	<input checked="" type="checkbox"/> 8	<input checked="" type="checkbox"/> 9	<input checked="" type="checkbox"/> 10	<input checked="" type="checkbox"/> 11	<input checked="" type="checkbox"/> 12
<input checked="" type="checkbox"/> 13	<input checked="" type="checkbox"/> 14	<input checked="" type="checkbox"/> 15	<input checked="" type="checkbox"/> 16	<input checked="" type="checkbox"/> 17	<input checked="" type="checkbox"/> 18	<input checked="" type="checkbox"/> 19	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 21	<input checked="" type="checkbox"/> 22	<input checked="" type="checkbox"/> 23	<input checked="" type="checkbox"/> 24
<input checked="" type="checkbox"/> 25	<input checked="" type="checkbox"/> 26	<input checked="" type="checkbox"/> 27	<input checked="" type="checkbox"/> 28	<input checked="" type="checkbox"/> 29	<input checked="" type="checkbox"/> 30	<input checked="" type="checkbox"/> 31	<input checked="" type="checkbox"/> 32	<input checked="" type="checkbox"/> 33	<input checked="" type="checkbox"/> 34	<input checked="" type="checkbox"/> 35	<input checked="" type="checkbox"/> 36
<input checked="" type="checkbox"/> 37	<input checked="" type="checkbox"/> 38	<input checked="" type="checkbox"/> 39	<input checked="" type="checkbox"/> 40	<input checked="" type="checkbox"/> 41	<input checked="" type="checkbox"/> 42	<input checked="" type="checkbox"/> 43	<input checked="" type="checkbox"/> 44	<input checked="" type="checkbox"/> 45	<input checked="" type="checkbox"/> 46	<input checked="" type="checkbox"/> 47	<input checked="" type="checkbox"/> 48
<input checked="" type="checkbox"/> 49	<input checked="" type="checkbox"/> 50	<input checked="" type="checkbox"/> 51	<input checked="" type="checkbox"/> 52	<input checked="" type="checkbox"/> 53	<input checked="" type="checkbox"/> 54	<input checked="" type="checkbox"/> 55	<input checked="" type="checkbox"/> 56	<input checked="" type="checkbox"/> 57	<input checked="" type="checkbox"/> 58	<input checked="" type="checkbox"/> 59	<input checked="" type="checkbox"/> 60



**1** You may enter up to 6 keywords, one at each prompt.



# Aesthetic and minimalist design



# Help users recognize, diagnose, and recover from errors





- Problems must be rated according to:
  - The **frequency** with which the problem occurs: Is it common or rare?
  - The **impact** of the problem if it occurs: Will it be easy or difficult for the users to overcome?
  - The **persistence** of the problem: Is it a one-time problem that users can overcome once they know about it or will users repeatedly be bothered by the problem?



- 0 to 4 rating scale can be used to rate the severity of usability problems:
  - 0 = I don't agree that this is a usability problem at all
  - 1 = Cosmetic problem only: need not be fixed unless extra time is available on project
  - 2 = Minor usability problem: fixing this should be given low priority
  - 3 = Major usability problem: important to fix, so should be given high priority
  - 4 = Usability catastrophe: imperative to fix this before product can be released



- Try rating some of the problems you found



- Should be performed by several evaluators (one person will never be able to find all the problems)
- Evaluators should work independently:
  - First get a general idea of the UI
  - Then perform a detailed inspection using a set of heuristics
  - List usability problems (heuristics not followed and severity rating)
- Findings of all evaluators should be integrated in the same report
- The report should help the development team to prioritize problem fixing



- **Select a user interface (UI)** of any interactive system/device/application:
  - S/W (IDEs, Operating systems, other professional S/W)
  - web applications, mobile apps, etc.
  - consumer electronics (TV , home audio, vehicle electronics , appliances, phones...)
  - wearable devices (smart watches, fitness bands, etc.)
  - office (copier, printer, scanner, fax, etc.), scientific or medical equipment...)
- The selected UI should not be too simple; if too complex evaluate only part of it
- **Propose your choice and ask for validation at the next Lab class**



- Perform a heuristic evaluation (the four students must work independently in a first phase)
- Using the 10 heuristics by Nielsen or any other set you consider adequate (after asking for permission to use it)
- Find usability problems and assign a severity degree to each problem (use the scale proposed by Nielsen)





**Assignment presentation 4, 12, 7 March**

**Assignment submission 4, 5, 7 March**

- Prepare a **15 minute presentation** (~15 slides) briefly describing:
  - the UI and intended usage (target users, main tasks...)
  - the methods used in the evaluation (heuristics sets)
  - the main results obtained
  - a table with a summary of problems found by each and all evaluators
  - your overall appreciation of the UI usability and UX
- The presentation file should have a **name:** “PX\_name of system evaluated”  
(e.g. P1\_SmartWatch)
- Submit the presentation **through Moodle:**
  - March 4 (Monday classes)**
  - March 5 (Tuesday classes)**
  - March 7 (Thursday classes)**

# Cognitive walkthrough





- Usability **inspection method** (thus not involving users)
- Based on the fact that users usually prefer to learn a system by using it (e.g., instead of studying a manual)
- Focused on **assessing learnability** (i.e., how easy it is for new users to accomplish tasks with the system)
- May produce results quickly at a low cost
- Applicable at **early phases**, before any coding



- 1- Task analysis: sequence of steps or actions required by a user to accomplish a task, and the system responses
- 2- Designers and developers walkthrough as a group, asking themselves a set of questions at each step
- 3- Data gathering during the walkthrough: answering the questions for each subtask usability problems are detected
- 4- Report of potential issues
- 5- UI redesign to address the issues identified



- **Will the user try to achieve the effect that the subtask has?**  
(Does the user understand this subtask is needed to reach the goal?)
- **Will the user notice that the correct action is available?**  
(E.g. is the button visible?)
- **Will the user understand that the wanted subtask can be achieved by the action?**  
(E.g. the button is visible but the user doesn't understand the text and will not click on it)
- **Does the user get feedback?**  
Will the user know that they have done the right thing?



- The evaluator doesn't know how to perform the task; the method involves the **optimal** sequence of actions
- Involves an extensive analysis and documentation and often too many potential issues are detected, resulting very **time consuming**

**Thus:**

**Lighter variants of Cognitive Walkthrough** were proposed to make it **more applicable** in S/W development companies



comprises the 3 first  
questions of CW

- Only two questions:

- Will the user know what to do at this step?

- If the user does the right thing, will they know that they did the right thing, and are making progress towards their goal?

- And a set of rules to streamlining the walkthrough and trade-off granularity for coverage



## **According to Spencer the method can be applied successfully if the usability specialist:**

- takes care to prepare the team for the walkthrough,
- avoids design discussions during the walkthrough,
- explicitly neutralizes defensiveness among team members,
- streamlines the procedure by collapsing the first three questions into one question,
- and captures data selectively

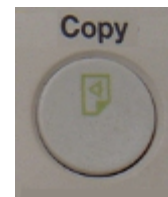




- Machine UI:
    - numeric keypad,
    - "Copy" button,
    - push button on the back to turn on the power
- The machine automatically turns itself off after 5 min inactivity



- Task: copy a single page
- User: any office worker
- Actions needed: turn on the power,  
put the original on the machine,  
press the "Copy" button



<http://hcibib.org/tcuid/chap-4.html#4-1>



- Story for action number one:  
“the user wants to make a copy and knows that the machine has to be turned on. So she pushes the power button. Then she goes on to the next action”

Not convincing!


- why shouldn't the user assume that the machine is already on? That is often the case
- Will the user figure out that the machine is off, and find the power switch?  
etc. etc.



- Look for a phone number at the University of Aveiro Web site  
user: any student from the University
- Create a pdf of a PowerPoint file using the Print option but not printing the hidden slides  
user: anyone familiar with a previous version



### Task analysis:

- look for the icon  (directório);
  - input part of the person's name and search
  - get the phone number

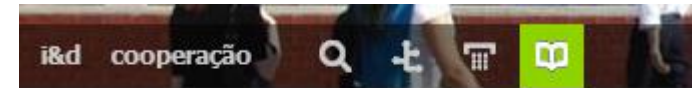
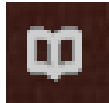
But the defined user profile (any student from the University) includes foreign students, thus a previous action is needed:

- select the English version

For each action we need to ask the two questions and put ourselves in the shoes of the user!



First action: find the icon



directório

**Q1 - Will the user know what to do at this step?**

Even reading the tooltip (directório) possibly the correct icon is not recognizable!

**Q2 - If the user does the right thing (selects the icon), will they know that they did the right thing, and are making progress towards their goal?**

lista telefónica > alfabética

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

pesquisar

página 1|23

1 2 3 4 5 6 7 8 9 ... >

Probably yes; this looks a familiar search bar and it is adequately labeled (lista telefónica; pesquisar)



Second action: input part of the person's name

**lista telefónica > alfabética**

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

nomes a pesquisar

página 1|23 1 2 3 4 5 6 7 8 9 ... >

**Q1 - Will the user know what to do at this step?**

Probably yes; the tooltip lets the user know he/she should input the person's name and select "pesquisar"

**Q2 - If the user does the right thing (selects the icon), will they know that they did the right thing, and are making progress towards their goal?**

página 1|1

Maria Beatriz Alves de Sousa Santos electrónica, telecomunicações e informática  
24117 | bss@ua.pt

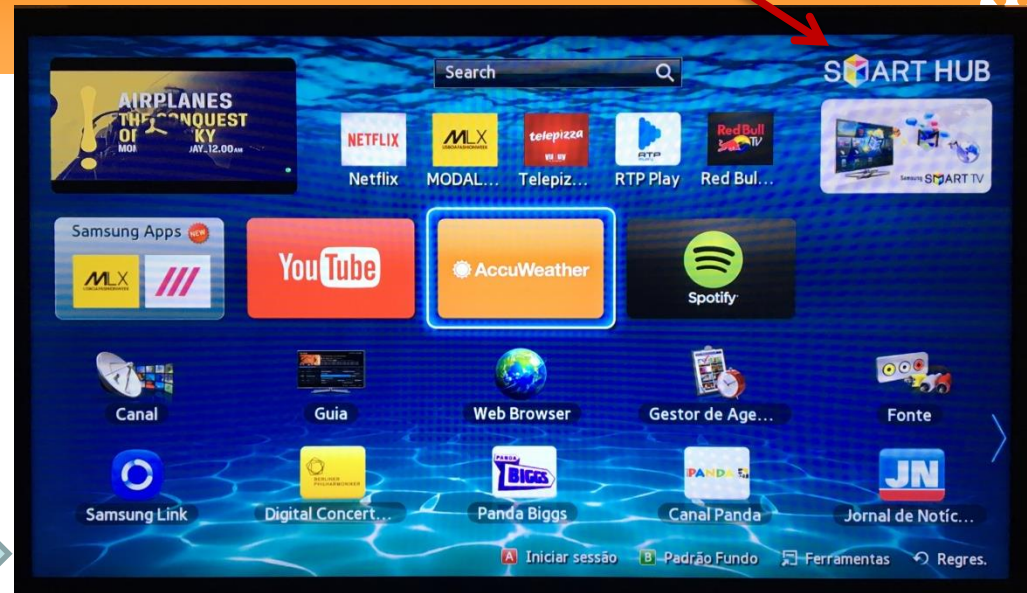
Probably yes; however, some users might not recognize 24117 as a phone number (it only has 5 digits, as it is internal, and not 9 as possibly expected)

# Another example: Smart TV

How to access  
the Internet?

(before  
reading the  
manual?)

(we see the  
symbol at the  
screen only  
after pressing it  
on the control!)





# Practice the Streamlined Cognitive Walkthrough:



Analysing interactive systems/applications that should be very intuitive:

- Turn on and off the video projector in your Lab using the remote control or directly on the projector  
user: any student from the University
- Create a pdf of a PowerPoint file but printing the hidden slides  
user: anyone familiar with previous or current versions of Office
- Change the Channel using the box of your TV service (not the remote control)  
user: anyone having a TV box







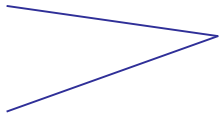
- Analytical (without users)
    - Heuristic Evaluation ✓
    - Cognitive Walkthrough
    - Model based methods
    - Review methods
    - ...
  - Empirical (involving users)
    - Observation
    - Query
    - Controlled Experiments
    - ...
    - usability tests ✓
- ( ✓ - we are going to use)



- Are subjective
- Involve several usability experts
- Cannot find all usability problems

**Thus, empirical methods (involving users) are needed**

observation  
query  
controlled experiments



Usability test (engineering approach)  
(scientific approach)

# Empirical methods





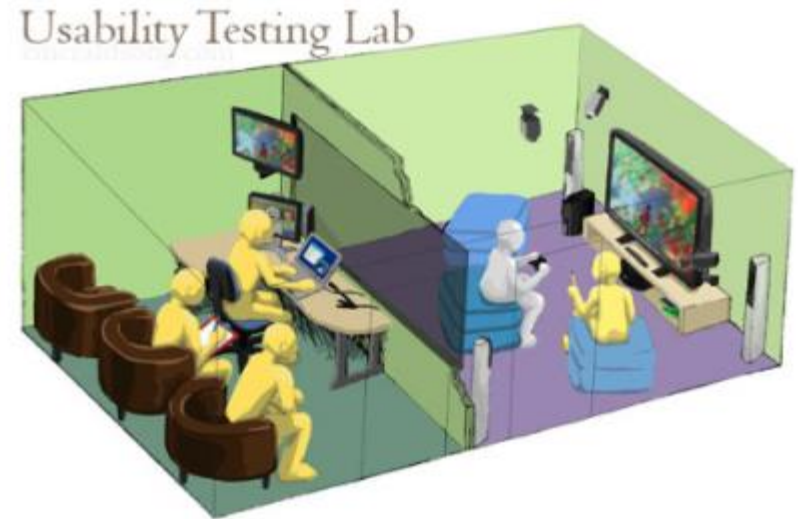
Involving users implies specific cautions:

- Asking for explicit consent
- Confidentiality
- Security (avoid any risk)
- Freedom (users may give up at any time)
- Limit stress

**It's the system that is under evaluation not the user!**

Has many variants from very simple to very complex and expensive:

- Direct: observer takes notes
- Undirect: through audio/ vídeo – more complex and time consuming
- Think Aloud: users are asked to explain what they are doing
- Logging: users activity is logged by the system
- Combinations of the previous, etc





- Two main variants:
  - Questionnaire (reach more people; less flexible)
  - Interview
- Should be carefully prepared and tested
- Collected data should be carefully analyzed



- The work horse of science ...
- Important issues to consider:
  - Hypothesis
  - Variables (input or independent; output or dependent)
  - Secondary variables
  - Experimental design (within groups; between groups)
  - Participants (number, profile)
  - Statistics



- Involve observation and query
- Main aspects:
  - Participants
  - Tasks
  - Test facilities and systems
  - Experimental design
  - Usability measures
  - Data analysis
- Have a complex logistics
- Standard: **Common Industry Format (CIF)** for usability test reports





- The total number of participants to be tested  
(a valid statistical analysis implies a sufficient number of subjects)
- Segmentation of user groups tested, if more than one
- Key characteristics and capabilities of user group  
(user profile: age, gender, computing experience, product experience, etc.)
- How to select participants
- Differences between the participant sample and the user population  
(e.g. actual users might have training whereas test subjects were untrained)



- The task scenarios for testing
- Why these tasks were selected  
(e.g. the most frequent tasks, the most troublesome tasks)
- The source of these tasks  
(e.g. observation of users using similar products, product specifications)
- Any task data given to the participants
- Completion or performance criteria established for each task  
(e.g. n. of clicks < N, time limit)



- Procedure: the logical design of the test
- Participant general instructions and task instructions
- The independent variables and control variables
- The usability measures to be used:
  - a) for effectiveness (completeness rate, errors, assists)
  - b) for efficiency (times)
  - c) for satisfaction



- The setting and type of space in which the evaluation will be done  
(e.g. usability lab, cubicle office, meeting room, home office, home family room, manufacturing floor, etc.)
- Any relevant features or circumstances that can affect the results  
(e.g. video and audio recording equipment, one-way mirrors, or automatic data collection equipment)
- Participant's Computing Environment  
(e.g. computer configuration, including model, OS version, required libraries or settings, browser name and version; relevant plug-in, etc. )
- Display and input devices characteristics
- Any questionnaires to be used



- There is a distinction between "formative" and "summative" usability tests.
- Formative tests are carried out:
  - During the development of a product;
  - To mould or improve the product;
  - Virtually anywhere (you don't need a lab);
  - With the test administrator and the participant co-present.
- The outputs from a formative test may include:
  - Participant comments in the form of a "thinking aloud" narrative (for example, attitudes, sources of confusion, reasons for actions);
  - Photographs and highlights videos;
  - Usability problems and suggested fixes.

<https://www.userfocus.co.uk/articles/cif.html>



- In contrast, summative tests are carried out:
  - At the end of a development stage;
  - To measure or validate the usability of a product;
  - To answer the question: "How usable is this product";
  - To compare against competitor products or usability metrics;
  - To generate data to support marketing claims about usability;
  - In a usability lab;
  - With the participant working alone.
- The outputs from a summative test may include:
  - Statistical measures of usability (for example, success rate, average time to complete a task, number of assists);
  - Reports or white papers.

<https://www.userfocus.co.uk/articles/cif.html>



METHOD	ADVANTAGES	DISADVANTAGES
<b>FORMATIVE OR DIAGNOSTIC TEST</b>	<p>Quickly highlights real problems.</p> <p>Verbal protocols valuable source of information.</p> <p>Can be used early in design to support rapid iterative development.</p> <p>Easy to prioritise problems.</p>	<p>Technique requires a test administrator who can keep the user talking.</p> <p>"Thinking aloud" can affect user behaviour and performance levels.</p> <p>Analysis of verbal protocols can be time consuming</p>
<b>SUMMATIVE OR MEASUREMENT TEST</b>	<p>Provides real performance data.</p> <p>Answers the question: "How usable is this web site"</p> <p>Can compare different groups of users and different systems.</p> <p>High reliability and validity.</p>	<p>Technique requires a test administrator who knows how to avoid test bias.</p> <p>Technique requires a usability lab.</p> <p>Tasks can sometimes be artificial and restricted.</p> <p>Statistical analysis of data can be time consuming.</p>



- Specifies the format for reporting the results of a **summative** evaluation
- The most common type of usability evaluation is **formative**, (i.e. designed to identify problems that can be fixed)
- A summative evaluation produces usability metrics that describe how usable a product is when used in a particular context of use
- The CIF report format and metrics are consistent with the ISO 9241-11  
<http://www.usabilitynet.org/prue/cif.htm>  
<https://www.nist.gov/itl/iad/industry-usability-reporting>
- Top ten things to know about the CIF (a list of do and don't)  
[http://zing.ncsl.nist.gov/iusr/top\\_ten.html](http://zing.ncsl.nist.gov/iusr/top_ten.html)





- It is **not formally related to standards-making efforts** but has been informed by existing standards and is **consistent with major portions of these documents** but is more limited in scope:
- **ISO 9241-11(1998)**: Ergonomic requirements for office work with visual display terminals (VDTs) - Part 11: Guidance on usability
- **ISO/IEC 14598-5(1998)**: Information technology – Software product evaluation -Part 5: Process for evaluators
- **ISO 13407(1999)**: Human-centred design processes for interactive systems – Annex C
- **ISO/IEC 9126-2(2001)**: Software Engineering – Product quality - Part 2: External metrics
- **ISO/IEC 9126-3(2001)**: Software engineering – Product quality - Part 3: Internal metrics
- **ISO/IEC 9126-4(2001)**: Software engineering – Product quality - Part 4: Quality in use metrics



- System Usability Scale (SUS)
  - Questionnaire for User Interface Satisfaction (QUIS)
- SUS provides a “quick and dirty”, reliable tool for measuring the usability
  - It includes 10 questions with five response options
  - QUIS is a measurement tool designed to assess a computer user's subjective satisfaction with the UI
  - It is designed to be configured according to the needs of each UI analysis by including only the sections that are of interest to the user
  - It includes questions with ten response options
  - Both questionnaires should be completed following use of the UI in question



- Provides a “quick and dirty”, reliable tool for measuring the usability
- It includes 10 questions with five response options
- It allows to evaluate a wide variety of products and services (H/W, S/W, mobile devices, websites and applications)
- Has become an industry standard, with references in over 1300 publications

## **Benefits of using a SUS**

- Is a very easy scale to administer to participants
- Can be used on small sample sizes with reliable results
- Is valid – it can differentiate between usable and unusable systems

<https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html>



- I think that I would like to use this system frequently.
- I found the system unnecessarily complex.
- I thought the system was easy to use.
- I think that I would need the support of a technical person to be able to use this system.
- I found the various functions in this system were well integrated.
- I thought there was too much inconsistency in this system.
- I would imagine that most people would learn to use this system very quickly.
- I found the system very cumbersome to use.
- I felt very confident using the system.
- I needed to learn a lot of things before I could get going with this system.

<https://www.usability.gov/how-to-and-tools/resources/templates/system-usability-scale-sus.html>



	Strongly disagree							Strongly agree
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	1	2	3	4	5			
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	1	2	3	4	5			
3. I thought the system was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	1	2	3	4	5			
4. I think that I would need the support of a technical person to be able to use this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	1	2	3	4	5			

...

Let  $R(n)$  be the answer to Question  $n$ :

$$SUS \leftarrow \sum_{n=1}^5 (R(n) - 1 + 5 - R(n+1)) * 2.5$$

0... 100;  $SUS > 68$  would be considered above average



- The QUIS contains:
  - a demographic questionnaire,
  - a measure of overall system satisfaction,
  - a measure of specific UI factors (e.g. screen visibility, terminology and system information, learning factors, and system capabilities)
- QUIS has pen and paper and PC software versions for administration
- Uses a 10-point scale to rate 21 items relating to the system's usability
- These ratings produce data for the overall reaction to a system's usability on 6 factors.
- It is easy to use and analyse.

<https://ext.eurocontrol.int/ehp/?q=node/1611>

# Example questions of QUIS

## OVERALL REACTIONS TO THE SOFTWARE

terrible 0 1 2 3 4 5 6 7 8 9 wonderful

difficult 0 1 2 3 4 5 6 7 8 9 easy

frustrating 0 1 2 3 4 5 6 7 8 9 satisfying

inadequate power 0 1 2 3 4 5 6 7 8 9 adequate power

dull 0 1 2 3 4 5 6 7 8 9 stimulating

rigid 0 1 2 3 4 5 6 7 8 9 flexible

## SCREEN

Characters on the computer screen

hard to read 0 1 2 3 4 5 6 7 8 9 easy to read

Highlighting on the screen simplifies task

not at all 0 1 2 3 4 5 6 7 8 9 very much

Organization of information on screen

confusing 0 1 2 3 4 5 6 7 8 9 very clear

## USABILITY AND USER INTERFACE

Use of colors and sounds

poor 0 1 2 3 4 5 6 7 8 9 good

System feedback

poor 0 1 2 3 4 5 6 7 8 9 good

System response to errors

awkward 0 1 2 3 4 5 6 7 8 9 gracious

System messages and reports

poor 0 1 2 3 4 5 6 7 8 9 good

System clutter and UI “noise”

poor 0 1 2 3 4 5 6 7 8 9 good



## TERMINOLOGY AND SYSTEM INFORMATION

Use of terms throughout system

inconsistent 0 1 2 3 4 5 6 7 8 9 consistent

Computer terminology is related to the task you are doing

never 0 1 2 3 4 5 6 7 8 9 always

Position of messages on screen

inconsistent 0 1 2 3 4 5 6 7 8 9 consistent

Messages on screen which prompt user for input

confusing 0 1 2 3 4 5 6 7 8 9 clear

Computer keeps you informed about what it is doing

never 0 1 2 3 4 5 6 7 8 9 always

Error messages

unhelpful 0 1 2 3 4 5 6 7 8 9 helpful

## LEARNING

Learning to operate the system

difficult 0 1 2 3 4 5 6 7 8 9 easy

Exploring new features by trial and error

difficult 0 1 2 3 4 5 6 7 8 9 easy

Remembering names and use of commands

difficult 0 1 2 3 4 5 6 7 8 9 easy

Tasks can be performed in a straight-forward manner

never 0 1 2 3 4 5 6 7 8 9 always

Help messages on the screen

unhelpful 0 1 2 3 4 5 6 7 8 9 helpful

Supplemental reference materials

confusing 0 1 2 3 4 5 6 7 8 9 clear





- Consider the application/site/device you have evaluated using analytical methods
- Define the potential users and context of use
- Define a list of tasks (e.g. task that seemed more difficult or more important)
- Select a set of usability measures (times, errors, complete rates...)
- Prepare all the materials:
  - declaration of consent
  - list of tasks and perceived difficulty
  - final questionnaire
  - list of tasks for the observer to take notes
- Run a pilot test

To the user

To the observer

# Materials to use during the test (examples in Moodle)



## Consentimento informado

Neste teste de usabilidade:

- Vamos pedir-lhe que realize algumas tarefas com a ajuda dum sistema;
- Vamos observá-lo e entrevistá-lo quanto à utilização do sistema.

A participação neste teste de usabilidade é voluntária e pode cessá-la a qualquer momento. Toda a Informação recolhida é estritamente confidencial, no entanto os resultados poderão ser usados para melhorar o sistema. O aspecto da sua identificação não serão usados em caso algum

## Questionário Pós - Tarefa

**Instruções:** Agradecemos a sua colaboração na realização deste estudo, qu a *Interface de Utilizador* do sistema XXX e, consequentemente, tentar critérios de *Usabilidade*.

A sua colaboração constitui um factor importante para o êxito desta avaliação e o preenchimento deste questionário, cujos dados serão usados com to fins científicos.

### 1. Dados pessoais

NI de utilizador: \_\_\_\_\_

(assinale com uma cruz as opções correctas)

Género: ☐ Feminino ☐ Masculino

Idade: \_\_\_\_\_

### 2. Opinião geral sobre o sistema

Após a utilização do sistema e tendo em conta a sua avaliação final, assinale com uma cruz o círculo que melhor reflecte a sua opinião em relação à utilização do sistema. Caso considere que estas quantificações não são aplicáveis, escolha NA.

#### 2.1. Opinião sobre a utilização do sistema (assinale com uma cruz a opção que melhor corresponde à sua posição)

É fácil orientar-me no sistema

Discordo totalmente ☐ ☐ ☐ ☐ ☐ Concorde totalmente NA

Encontro facilmente o que procuro no sistema

Discordo totalmente ☐ ☐ ☐ ☐ ☐ Concorde totalmente NA

## 1- Informed consent form

## 2- List of tasks to the use

Tarefa 1	_____
	Nada Fácil <input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 Muito Fácil

Tarefa 2	_____
	Nada Fácil <input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 Muito Fácil

NI de utilizador: \_\_\_\_\_

### Guião do Observador

Tarefa	Nº cliques	Completoou a Tarefa?	Tempo Máximo Tempo observado (mm:ss)	Cometeu erros?	Sentiu-se perdido?	Solicitou ajuda	Grau de facilidade observada 1 – Nada Fácil 5 – Muito Fácil
1		não <input type="checkbox"/> sim <input type="checkbox"/>	2m :	não <input type="checkbox"/> poucos <input type="checkbox"/> muitos <input type="checkbox"/>	não <input type="checkbox"/> pouco <input type="checkbox"/> muito <input type="checkbox"/>	não <input type="checkbox"/> sim <input type="checkbox"/> qual?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5
2		não <input type="checkbox"/> sim <input type="checkbox"/>	2m :	não <input type="checkbox"/> poucos <input type="checkbox"/> muitos <input type="checkbox"/>	não <input type="checkbox"/> pouco <input type="checkbox"/> muito <input type="checkbox"/>	não <input type="checkbox"/> sim <input type="checkbox"/> qual?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5
3		não <input type="checkbox"/> sim <input type="checkbox"/>	2m :	não <input type="checkbox"/> poucos <input type="checkbox"/> muitos <input type="checkbox"/>	não <input type="checkbox"/> pouco <input type="checkbox"/> muito <input type="checkbox"/>	não <input type="checkbox"/> sim <input type="checkbox"/> qual?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5
4		não <input type="checkbox"/> sim <input type="checkbox"/>	2m :	não <input type="checkbox"/> poucos <input type="checkbox"/> muitos <input type="checkbox"/>	não <input type="checkbox"/> pouco <input type="checkbox"/> muito <input type="checkbox"/>	não <input type="checkbox"/> sim <input type="checkbox"/> qual?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5
5		não <input type="checkbox"/> sim <input type="checkbox"/>	2m :	não <input type="checkbox"/> poucos <input type="checkbox"/> muitos <input type="checkbox"/>	não <input type="checkbox"/> pouco <input type="checkbox"/> muito <input type="checkbox"/>	não <input type="checkbox"/> sim <input type="checkbox"/> qual?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5

Observações

## 2- Post-task questionnaire

## 2- Observer's script



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