

Name and student number:

Exam HCI – Human-Computer Interaction
course code 400312

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Friday 13 January 2006

13:30 – 16:30

Q112

Write your name and student number on every page.

Please write clearly, in English or Dutch, in the space provided on the exam paper.

In the case of Multiple Choice questions, choose **one** answer which you think is most correct, by placing a circle around the a), b), c) or d).

The exam paper cannot be taken away.

No books, readers or articles may be used for making the exam.

Points are indicated with each question, a total of 100 points can be gained. This would result in the end mark of 10!

Name and student number: _____

1. HCI is a multidisciplinary research field, and relatively new. Mention at least five of the (more established or older) scientific, engineering or design disciplines that inform HCI. Describe two of these examples in more detail, illustrate how they inform HCI and how they are incorporated.

(6 points)

2. What are *affordances*? Give three examples of things and their affordances (bonus point for the most original example!).

(6 points)

3. A 'Wizard' is particularly useful for:

- a) outlining a complex navigational structure for the user
- b) guiding a user step by step through a process
- c) defending users from being attacked by Orks
- d) offering the user an overview

(3 points)

Name and student number: _____

4. As part of the early design phase often a requirements analysis is carried out. Recent research suggests that investigating *negative requirements* is important. What is the risk of ignoring negative requirements?

- a) That negative goals change in positive goals.
- b) That changes in positive goals are not covered.
- c) That changes in negative goals are not covered.
- d) That positive goals change in negative goals.

(3 points)

5. An interface may facilitate input and output for a computer. What roles do *sensors* and *actuators* have in an interface?

(5 points)

6. The technological artefacts and systems that we interact with, can be distinguished in several historical stages. Give an example of the following technological categories (this may be a musical instrument), and indicate how we interact with them:

electronical

mechanical

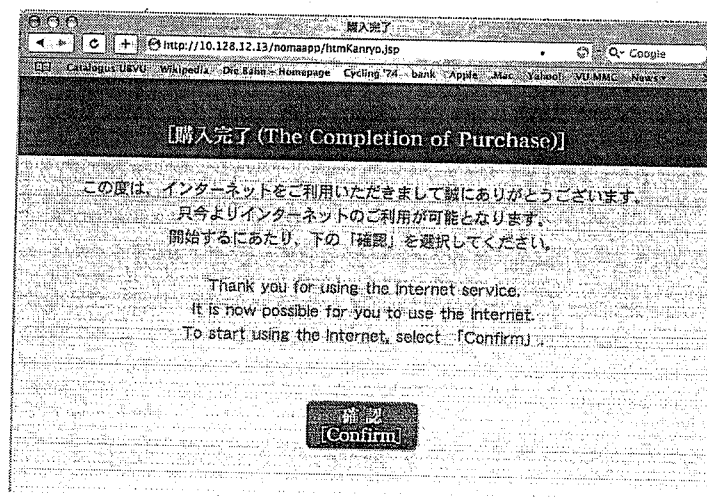
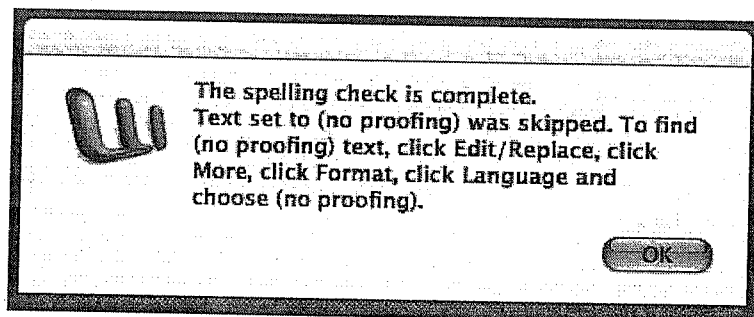
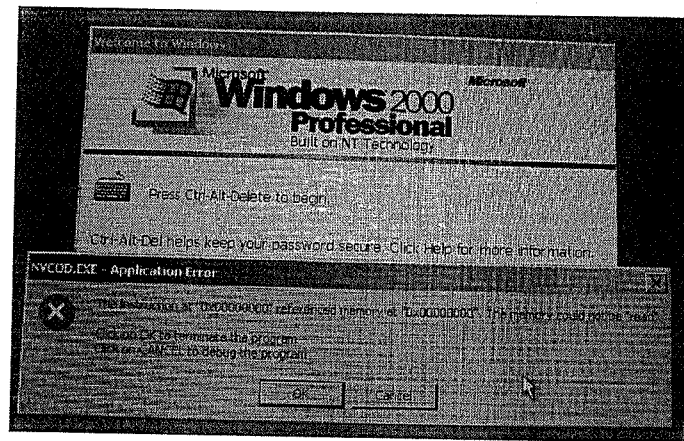
optical

(Bear in mind that most systems, particularly the more complex ones, are of a compound nature, ie. they consist of multiple technologies. Such systems are categorised by there most dominant function.)

(6 points)

7. Below are three examples from my collection of weird dialogs with computers. Select at least one to describe from a usability point of view, what is confusing, what goes wrong, how to improve them?

(5 points)



8. How many Degrees of Freedom (DoF's) does this mouse have? Describe them.

(4 points)



9. What is a, according to the theory of Human Information Processing *Short Term Sensory Storage* (STSS) or sensory memory? Give an example, and relate it to user interface design.

(5 points)

10. The classical categorisation in five senses (seeing, hearing, smelling, tasting and feeling) is insufficient for the field of study of HCI. Name three more senses or sub-senses, and indicate how these modalities can be applied in interface design for interactive systems.

(6 points)

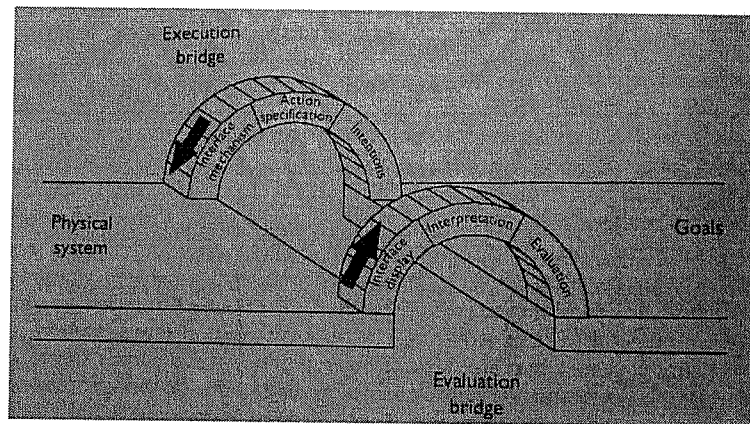
Name and student number: _____

11. What are the potential disadvantages of using *metaphors* in the user interface?

(5 points)

12. What does Donald Norman mean with the Gulf of Execution and the Gulf of Evaluation?

(5 points)



(btw: Professor Norman will be awarded a honorary doctorate *today* at the Industrial Design department of the Delft University of Technology!)

13. The interaction between human and computer systems can often be described in various layers (up to seven), for instance to do with the goals, or the actual actions carried out. Give the names and description of at least two of such layers.

(8 points)

Name and student number:

14. In the picture below (a cartoon from Kamagurka) we can see a 'user' struggling with technology, apparently because he has the wrong mental model of how the system works. As a result, his conclusion ("I think the batteries have run out") is wrong.



What is a good definition of a mental model? Give an example.

(6 points)

16. What sort of things can one measure *quantitatively* rather than qualitatively in a usability test? And how would you approach that?

(6 points)

Name and student number: _____

17. Various formal models have been developed, which can be applied in the structured design process of User Interfaces. For instance the GOMS model and the Key-stroke Level Model (KLM), which are quite different. Answer the following questions about these models:

- What are these GOMS and KLM?
- In what situations would you apply each?
- What are good and bad qualities of each?

(8 points)

18. What is, in ethnographic terms, *implicit group knowledge*? Give an example.

(4 points)

Name and student number: _____

19. What is the main function of Task Model 2 (TM2) in the GTA design method?

(3 points)

- a) to envision the future
- b) to ensure a consistent design style
- c) to describe the current situation
- d) to create a "To Do list", an overview of tasks to perform today

20. Make a hierarchical task analysis of an activity (choose an activity). Describe one level, and work out one element to a second level.

(6 points)