Interfaces, or Human-Computer Interaction

15 maart 2001

Note: Although the exam is in English, you are free to give your answers in either English or Dutch. Good luck.

Question 1 [10 points]

Answer 'Yes' or 'no'. Are the following statements correct?

(a) Regardless of context, interfaces should always strive to make the cognitive processes associated with them automatic, because automatic cognitive processes are faster and do not burden the limited cognitive capacity.

(b) In the context of mental models, the "system image" is really the "interface" of a system.

(c) One reason why command line interfaces, like those offered by UNIX, are so difficult is that in addition to all the command names, one has to remember the options that correspond to the commands.

(d) For a new interface for a cash machine, it would be a good idea to try to provide users with the right *structural* (mental) model.

(e) There are various models of how knowledge is stored, as witnessed by the views held by the *propositionalists* and those held by the *imagists*. More recently a third school of thought arose, known as *connectionism*, which opposes both of these views.

(f) A command line interface offers an interaction style that is more suited to expert users.

(g) Desaturation of colours helps to enable users to focus on all the colours in an object.

(h) The window working set for a task varies with the screen size.

(i) Regardless of the interaction style, tooltips can be used (e.g. to remove ambiguity).

Question 2 [20 points]

At Schiphol airport a new system is introduced to help tourists find a hotel quickly. For example, a user may specify a price range, and/or a location, etc., and the system provides a list of hotel names with the corresponding contact details.

(a) What interaction style would you use and why? (Provide both main category and subcategory, for example: 'linguistic, command language interface'.)

(b) Sketch roughly how the interaction takes place.

A competitor designs an interface for a similar system as follows:

- First, users select the price range (how this is implemented is not important—you may assume that this is well-designed).
- Next, the system presents a map of the country, subdivided in 10 rectangular areas, each with a *different colour*.
- A user may click on an area to restrict the search to that sub-area.
- If they do so, they are presented with a new map, zoomed in on the selected sub-area. The new map is again subdivided in 10 areas, each with its own colour. Again the user may zoom in to restrict the search even more, etc. However much is zoomed in, the system always displays a map with 10 colour-coded areas. Assume that at each level, it is possible to go back to the previous level.
- Finally, when the user has selected the appropriate area in sufficient detail, he/she presses a 'SEARCH' bottom which displays the results (if any).
- The results are displayed on a new screen and each resulting record is displayed in the colour that corresponds to the sub-area on the map that was last shown (i.e. the map on the previous screen).

(c) Regardless of *what* colours are used, criticise the *way* in which colour is used, focusing on the capabilities of human users.

(d) Indicate 3 more problems with this interface.

(e) Given the competitor's solution, give (in a table) a usability specification which includes at least 3 tasks. In the table, you do not have to fill in the fields that you don't know. Also indicate the time dimension for each task (e.g. 'initial performance').

(f) What could be the use of such a usability specification?

Question 3 [15 points]

"When designing a computer interface in a context for which good computer-based prototyping tools exist (allowing us to make a very realistic representation of the interface on a real system), approaches such as used by PICTIVE are not very useful."

(a) Explain in detail why you agree/disagree with this statement. Give real-world examples to illustrate your point.

(b) Explain the differences between *RAPID* prototypes and *evolutionary* prototypes. For each type, give an example of a situation where you would use it.

Question 4 [20 points]

(a) Name the five main evaluation methods and mention (briefly!) their advantages and disadvantages.

(b) Name and discuss (briefly) 3 different types of *analytical* evaluation.

Question 5 [25 points]

See Figure 1. You are asked to design a new interface for a system called *Blissed* for creating and editing documents in the BLISS pictogram language which currently provides the following functionality:

- Two icons bars show the current subset of Bliss symbols. These symbols may be used to create sentences. The top bar shows the 'basic' repertoire', which we assume to be fixed (it contains symbols that are used in many situations), while the bottom bar shows a set of symbols that are specific to a certain topic (e.g. ordering food in a restaurant, talking about the weather, etc.).
- Users start by creating a document to work with using the 'file' menu, by either opening an existing document, or by selecting the 'new document' menu item (not shown).
- Next, they specify the topical symbol set (which is initially empty).
- Users then click (e.g. left mouse button) on the symbols in either bar to select them and drag them to the appropriate position in the document. On mouse-release the symbol is inserted at that position.
- A symbol is removed by selecting (e.g. left mouse button) a Bliss symbol which was previously placed in the document and subsequently pressing 'delete'.
- While writing in this way, users may change the topical symbol set using the 'pick-topic' pull-down menu indicated in the figure.
- Users may 'save' the document using the 'file' menu.
- When done, they use the 'file' menu to quit.

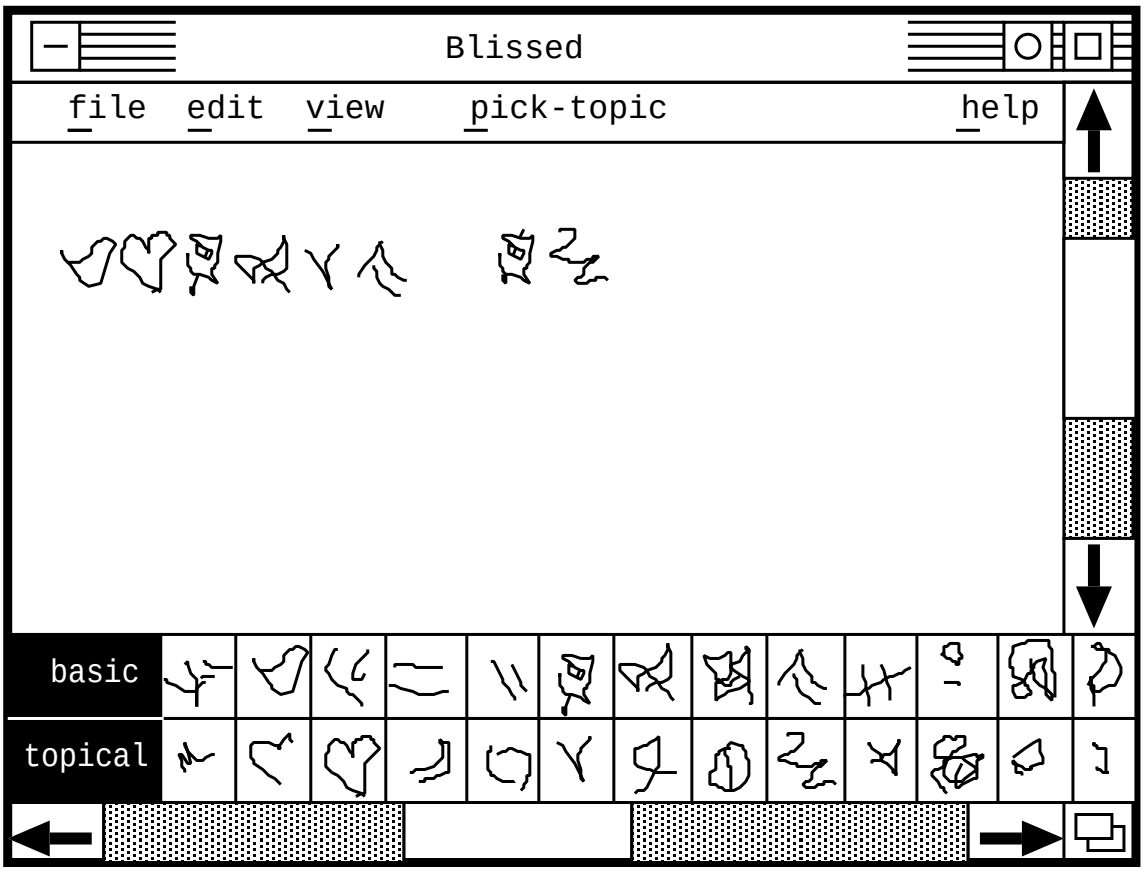

Figure 1: Schematic overview of *Blissed*

Because the above description is informal and hence a little ambiguous, you have some freedom in interpreting it. However, if you need to make assumptions, list them explicitly.

(a) Make up a problem statement and user analysis for the described system.

Now answer the following questions about task analysis.

(b) Draw the task hierarchy diagram (THD) for the task "Edit Bliss-document". Indicate in the THD which tasks can be executed in parallel.

(c) Annotate the THD. Indicate in the figure the plan for inserting a Bliss symbol in the document.

(d) What could the THD you just created be used for?