

MILITARY COLLEGE OF SIGNALS
MIDTERM EXAM
BESE 14 – (A & B)
CSE 476 Human Computer Interfacing

Instructor: A/P Dr. Imran Siddiqi

Time: 90 Minutes

Max Marks: 30

(2+2+2+2)

1. Differentiate between the following and give at least one example of each:

a. Retroactive interference & proactive inhibition

In retroactive interference new information replaces the old information in memory. E.g. recalling older telephone number is sometimes difficult.

In proactive inhibition old may interfere with the new one. E.g. driving to your old house.

b. Recall & recognition

Recall is the act of reproducing a specific incident, fact or other item (from long term memory). E.g. recalling where you were last weekend, fill-in-the-blank on exams.

In recognition, information provided gives knowledge/cue that it has been seen before. E.g. recognize a suspect in a police line-up, MCQs in an exam.

c. Slips & mistakes

Mistakes are the errors in choosing an objective or specifying a method of achieving it. E.g. clicking on the search icon thinking it would zoom the current page. Slips on the other hand are errors in carrying out an intended method for reaching an objective. Possible causes could be poor skill or inattention. E.g. accidentally clicking the search icon when you actually wanted to click on the adjacent save icon.

d. Gulf of execution & gulf of evaluation

Gulf of Execution is the difference b/w user's formulation of actions & actions allowed by the system. The user can't accomplish his goal using the Interface. E.g. You want to record the current channel using VCR remote control but the interface lacks the desired options.

Gulf of Evaluation is the difference b/w presentation of the system state & user expectation. The user cannot figure out whether the goal has been accomplished or not. E.g. You pressed some keys on the remote control of a VCR to start recording but you are not able to figure out whether the recording started or not.

(2+1.5)

2. a. What is a chord keyboard? How many keys would you need on such a keyboard to allow the input of all alphanumeric characters ('a' to 'z', 'A' to 'Z' and '0' to '9')?

A chord keyboard is a compact keyboard with only a few keys – Four or Five. Letters typed as combination of key presses which is similar to similar to playing a chord on a piano.

Since each key press serves as a single bit, with n keys one may input 2^n different characters. For all alphanumeric characters: $26+26+10 = 62$, a total of 6 keys would be needed.

- b. Give one example each where the following could be used as an input or output device.

- i. Head-up Display
As an output device in the cockpit
- ii. Digital Paper
As an output device for printing banners
- iii. Handwriting Recognition
As an input device in PDAs.

(5+2)

3. a. **List** the features of *direct manipulation* and discuss whether the act of dragging a folder icon to the trash can satisfies these features.

- Visibility of objects of Interest
 - Incremental action at the interface with rapid feedback on all actions
 - Reversibility of all actions, so that users are encouraged to explore without severe penalties
 - Syntactic correctness of all actions, so that every action is a legal operation
 - Replacement of complex command language with actions to manipulate directly the visible objects
- Dragging a folder icon to the trash can is a perfect example of direct manipulation.
 - Users can see both the trash and the folder they want to move to the trash.
 - While dragging the folder, the icon moves as well and when the mouse is placed over the trash, there is a shading indication that it has been selected.
 - The user can change his mind at any time while dragging the folder to the trash and even after placing it there, it can easily be taken out of the trash and put back in place.
 - No syntactic errors are possible in dragging an icon from one place to another.
 - The user does not need to input any commands to perform the desired action.

b. Deleting files by dragging them to the trash can is a perfectly intuitive *metaphor*. Macintosh designers extended this metaphor to include the function of ejecting diskettes: drag an image of the diskette to the trash can to eject it from the computer. Do you view it as an obvious *metaphor*? If not, identify the problem.

It is not an obvious metaphor as putting some thing into trash would mean that user does not want it any more. Dragging the diskette to the trash could be equivalent to deleting all the data on the diskette but it does not match with the eject operation.

(1.5+1.5+1.5)

- 4. a.** What is *persona* and when is it useful?

Person is the description of an 'example' user which is not necessarily a real person. It is useful in requirement analysis phase especially while designing a generic product where it is not easy to interact with all possible users of the system being designed.

- b.** What is the difference between global and local structure of navigation design?

Global structure is the overall structure of the system showing the movement between screens and their interconnections. The term local structure refers to the design of a single screen in the system that is looking from a given screen out.

- c.** What are *bread crumbs* in a web page and why are they useful?

Breadcrumbs show the path through web site/system hierarchy.
MCS->CS->BESE14B

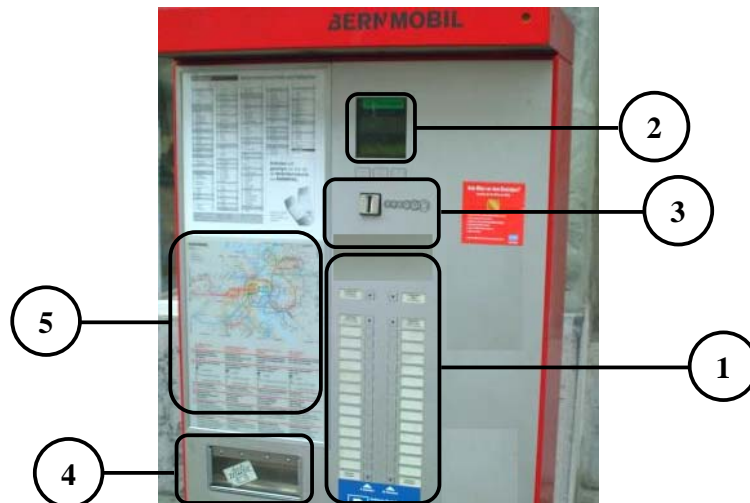
They not only give the user an idea of where he currently is in the overall hierarchy of the system but also allow him to jump directly to any of the upper levels.

(3+4)

- 4. a.** Imagine your class room and assume that there are a total of 10 lights arranged in two columns (5x2). Often it is desirable to turn on/off a particular light but the switch board does not indicate which button goes with which light. Design a switch board layout that makes it possible to instantly identify the mapping between buttons and lights.

The solution is not unique. A good idea could be to arrange the buttons on the board in the same layout as the lights on the ceiling and add a template on the board indicating which button goes with which light.

- b.** The transport system in the Swiss capital Bern comprises buses and trams and you can get the tickets at the ticketing machines installed at the bus/tram stations. The image below illustrates (a simplified form of) such a machine.



A session with the machine comprises following steps:

- a. User selects the destination station from panel (1) where all the stations are listed.
- b. The ticket price for the selected station is displayed in panel (2).
- c. User introduces the exact amount in the form of coins into slot (3).
- d. The ticket is printed and user collects it from tray (4).
- e. A network map is also displayed in panel (5).

Assuming that the machine only provides the functionalities listed above, list the pros and cons of this machine.

Solution is not unique. Some of the obvious advantages are:

- a. Very efficient for frequent users. They do not have to move between screens to get a ticket. Just push the required button (they are very used to this act), insert coins and get the ticket.
- b. A network map is displayed which could be useful for novice users.

A few disadvantages could be:

- a. Non frequent users have to browse the entire list of buttons to find their desired destination.
 - b. The machine accepts only coins – no bills no cards.
 - c. User needs to insert the exact amount; machine does not return any change.
 - d. There is no support for multiple tickets. If I am traveling with 10 persons I need to repeat the entire session 10 times.
 - e. There is no error handling, if user realizes he does not have enough money after inserting a certain amount; there is no way of getting back the inserted coins.
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