

UNIVERSITI SAINS MALAYSIA

Fit Semester Examination
Academic Session 2000/01

September/October 2000

CSC504 • Human-Computer Interaction

Duration : [3 hr.]

INSTRUCTION TO CANDIDATE:

- Please ensure that this examination paper contains SIX questions in FIVE printed pages before you start the examination.
 - Answer any **FIVE** questions.
 - You may answer in Bahasa Malaysia or English.
-

ENGLISH VERSION OF THE EXAMINATION PAPER

1. This question revolves around the cashpoint machines (or automated teller machines - ATM).

- (a) Suggest ideas for an interface for the ATM which uses the properties of sound effectively.

(25/100)

- (b) Discuss how you would usually use the three different types of human memory when using the ATM.

(25/100)

- (c) Discuss how the theory of forgetting, namely interference, may occur during ATM's transaction. Include in your discussion the two types of interference namely retroactive interference and proactive interference.

(25/100)

- (d) Most ATM in the country now use some kind of a limited keyboard with some additional buttons as input devices.

- (i) Suggest a reasonable alternative input device that can be used on an ATM. Explain.

- (ii) Suggest an input device that you think will be the worst possible for an ATM. Explain.

(25/100)

2. (a) The physical environment (in the context of health issues) that affects the quality of interaction may include

- (i) physical position,
(ii) lighting, and
(iii) the auditory environment/noise.

Describe briefly each of the above factors and how the factors might relate to the design of a cashpoint machine (or automated teller machine - ATM).

(45/100)

- (b) Consider a menu-driven word-processing system which provides both pull-down menus and keyboard accelerators (short cuts) (e.g. entering to print a document) to select commands.

- (i) What should a designer consider when mixing both pull-down menus and keyboard accelerators?
- (ii) Why do some functions/commands of such a system seem to be grouped together under the same menu heading? For example Cut, Copy, and Paste will invariably appear under the menu heading Edit.

- (iii) Consider the following:

What is the problem with using lots of menu heading? What is the problem of using very few menu headings?

You can group the functions/commands either into a few menu headings with lots of functions in each one, or you can put them into several menu headings with less in each. Which will be easier to use? Why?

Under the menu headings especially the ones with lots of functions, how would you arrange the functions/commands for better interaction? Explain

- (iv) Relate the word-processing system with the familiarity principle, which is one of the contributory principles of learnability.

(55/100)

3. (a) Write a short note on the following techniques or methods.

- (i) Prototyping
- (ii) Participatory design.
- (iii) Diagrammatic technique of the dialogue-notation.

(30/100)

- (b) Describe the interrelationship between the techniques or methods given in (a) above namely the interrelationship between (i) and (ii), (i) and (iii), and (ii) and (iii).

(25/100)

- (c) Self-service system was imposed on all petrol stations in the state of Penang recently. Perform a mental walk-through of the process typically involved in visiting a self-service petrol station, starting from the moment you arrive at the petrol station, filling up the tank, up to the point when you leave the petrol station. Please also consider various procedures including types of payment (cash or credit or debit card) and special arrangement for the disabled, visiting shops and other activities that may be carried out when visiting a petrol station. Perform a task analysis on the process and give the task decomposition and plans as well as the HTA (Hierarchical Task Analysis) diagram. Make sure that you employ the various types of plan that can be used in a HTA.

(45/100)

4. (a) Implementation support tools can generally be classified into:

- (i) windowing system,
- (ii) toolkits (collection of widgets), and
- (iii) User Interface Management System (UIMS).

Briefly describe the features of each category, and highlights their strengths/weaknesses for implementing interactive systems.

(40/100)

- (b) You are carrying out an observational evaluation of a computerised recipe book for use in the home kitchen. The system illustrates cooking procedures and gives step-by-step cooking instructions in text on a visual display. System functions can be accessed using a menu-based dialogue style; the user selects options using a touch screen, and some options bring up further menus.

- (i) How might you obtain data about what users are thinking as they use the system? What difficulties might you face in gaining this information and what shortcomings might exist in the data?
- (ii) You observe the following problems encountered by the users. In each case, discuss the observations and either propose solutions or suggest what further studies might be required to solve them :

...5/-

- The touch screen provided for interaction with the system quickly becomes covered in cooking ingredients from the user finger, obscuring the displayed image.
- Users have trouble reading the cooking instructions as they move about the kitchen.
- Users cannot remember which menu to select for some common commands.

(60/100)

5. (a) Name and briefly describe the six dimensions which characterise collaborative tasks.

(20/100)

- (b) Discuss the impact of computer-mediated communication (CMC) on group processes from the point of view of :

- (i) status effects,
- (ii) allocation and coordination of individual tasks,
- (iii) common ground.

Illustrate your answer by reference to examples of group tasks drawn from your readings.

(50/100)

- (c) With reference to the above, discuss the advantages and disadvantages of the use of ethnography as a technique for studying group processes.

(30/100)

6. (a) The traditional system is a glass box - all you can do is press buttons and see the effect. Multi-sensory systems are those that use more than one sensory channel in the interactions. Discuss the various channels that these systems may use, and suggests some of the applications where they can be used.

(40/100)

- (b) You are designing a multimedia system for sightless end-users which should allow them to "browse" the Internet.

- (i) Which media would you use to communicate with the different types of information - both input and output?
- (ii) Suggest how you would modify or enrich the information delivered by existing web browser to help sightless users easily surf the net.

(60/100)

- oooOooo -