

Exam question and sample answers for MSc HCI

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Question 1

Answer all parts

A computer games manufacturer is producing a new game called Gulliver. In this game the players travel through a virtual landscape in which are found various villages. Some of these villages are occupied by Lilliputians, who are only 6 inches tall; some by ordinary people; and some by Brobdingnagians, who are giants. The game uses a fully immersive VR headset. You have been asked to advise the game makers.

- (i) If the user 'stands still' in the virtual environment, a Lilliputian village that is very close, a normal village some way off and a Brobdingnagian village in the far distance will all look the same apparent size. What visual cues can the designers use to enable a user to distinguish them? (Say in your answer if any cues are better at distinguishing the miniature village from the normal one, or the normal one from the giant one.)
(10 marks)
- (ii) How does this change when the user is allowed to move in the environment?
(5 marks)

The same manufacturer also produces 3D visualisation software for shopping market analysis. A particular product lays out spheres in a 3D area where each sphere represents a shopper, the x,y,z coordinates represent age, income and length of stay in the shop and the size of the sphere represents the amount spent. The resulting pictures are printed in colour, but users report difficulty in seeing the 3D nature of the diagram

- (iii) Briefly explain (referring to answers of parts (i) and (ii) where appropriate) why viewing the spheres in 3D is difficult and why an interactive 3D display could help.
(5 marks)

Question 2

Answer all parts

Look at the following diagram of the Seeheim user interface architecture

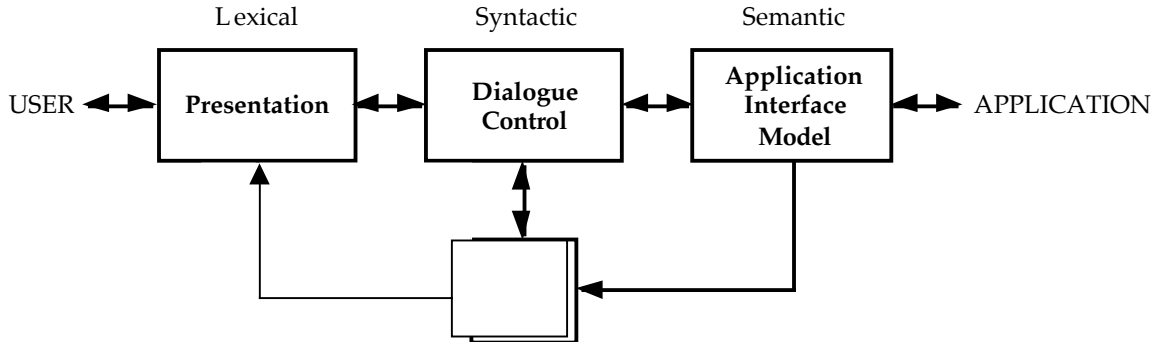


Figure 2.1 Seeheim model

- (i) Describe briefly the function of the three main boxes.
(5 marks)
- (ii) The lower unlabelled box is called "the switch" why is it there?
(5 marks)

A web site designer has been asked to design a web-based hotel finder for Lancaster Tourist Board. Hotels are added to a database using an existing non-web interface, usually in batches at the end of the week. You do not need to consider this interface, but should consider the rate of update in your answer.

The first stage of the project will offer the users various fixed views of the hotels, by area, by price range etc. The user will choose a particular area or price band and will then see a screen as shown in figure 2.2. The display has three areas (a) a heading (b) a list of hotels and (c) the details of one of the hotels. As the user selects different hotels in (b) the details in (c) are updated to reflect the chosen hotel.

Stage two will allow the user to specify queries based on criteria like price, facilities etc. and obtain similar custom search result screens.

- (iii) Discuss the different architectural choices suitable for implementing this over the web. Distinguish those options that would be suitable for the first stage only and those that would be suitable for both. Include discussion of client/server side processing options for interactive elements.
(10 marks)

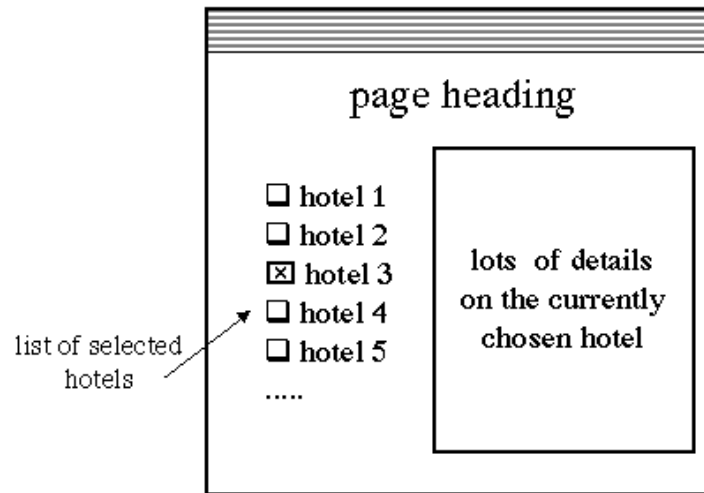


Figure 2.2 Sketch of web interface

Question 3

Answer all parts

For this question you will need to read the scenarios labelled "Scenarios for Questions 3 and 4"

A user interface designer analyses Andy's behaviour with his original phone and realises that both scenarios A and B are part of a general pattern as shown in the Hierarchical Task Analysis (HTA) in figure 3.1.

- (i) Complete the HTA for phoning using the original phone taking into account scenarios A and B only and briefly describe your solution. **(6 marks)**
- (ii) Do a complete HTA for phoning using the new phone based on scenario C only **(8 marks)**
- (iii) You will find that scenario C (and hence your solution to part (ii)) does not quite fit into the general pattern in figure 3.1. Discuss whether the solutions to (i) and (ii) can be modified to emphasise their common features and whether this would clarify the overall task description. **(6 marks)**

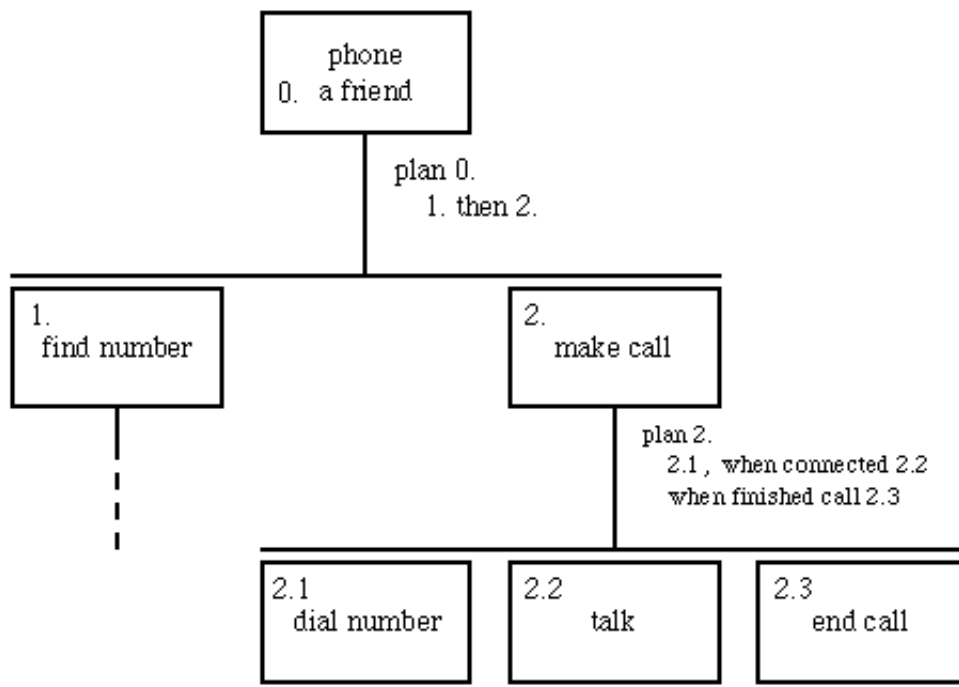


Figure 3.1. Rough HTA

Question 4

Answer all parts

For this question you will need to read the scenarios labelled "Scenarios for Questions 3 and 4"

Figure 4.1 shows a STN for the simple mobile phone described in scenarios A and B and shown in figure 3.1.

- (i) Identify any missing transitions and suggest possible behaviour that would be sensible for the user.
(5 marks)
- (ii) Scenario C demonstrates the additional behaviour of the new phone. Update the STN in figure 4.1 to add the new recall facilities of the new phone. Where there is not sufficient information in the scenarios choose suitable behaviour. You may also use ellipses (...) where you would expect major additional functionality (e.g. storing numbers), don't attempt to fully specify such additional functions. List and briefly describe and justify any such design decisions that are required or any other design issues that become apparent.
(10 marks)

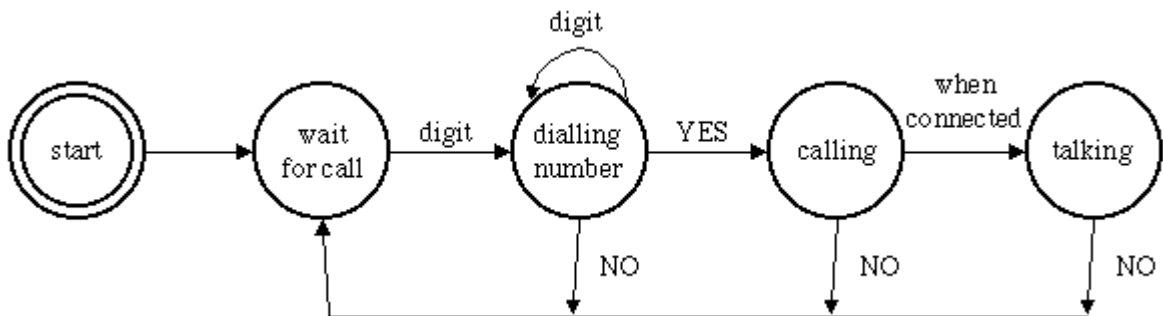


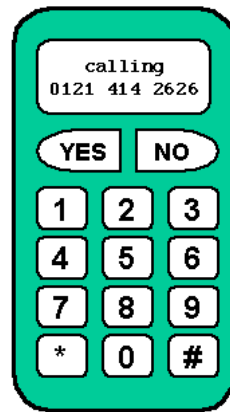
Figure 4.1. STN for original phone

- (iii) List the main elements of the state of the phone (you can use programming language variable declarations for this) and then write down a step-by-step walkthrough of the state as the user accesses short cut at position '3' as in steps C.1–C.10 of scenario C.
(5 marks)

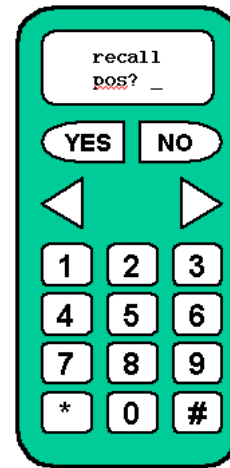
Scenarios for Questions 3 and 4

This describes a mobile phone example used in Questions 3 and 4.

Andy has an old mobile phone as shown below. It has no features beyond dialling a number.



original phone



new phone with menu buttons

Scenario A (original phone)

Andy decides to ring a friend for whom he already has the number in his (paper) address book.

- A.1 Andy looks up the phone number in his address book
- A.2 He dials the number into the phone
- A.3 The digits appear on the phone display
- A.3 He presses 'YES'
- A.4 The phone display says 'calling'
- A.5 A few seconds later it says 'connected'
- A.6 Andy talks to his friend
- A.7 When they finish talking Andy presses 'NO' to finish the call

Scenario B (original phone)

Andy decides to ring a friend for whom doesn't know the number


- B.1 Andy dials 192 (directory enquiries) into the phone
- B.2 The digits '192' appear on the phone display
- B.3 He presses 'YES'
- B.4 The phone display says 'calling'
- B.5 A few seconds later it says 'connected'
- B.6 Andy talks to the operator and asks for the number of his friend
- B.7 As the operator reads the number to him he writes it down on a scrap of paper
- B.8 He starts to dial the number as in A.2 on

Scenarios for Questions 3 and 4 (continued)

When Andy gets his new phone he can still use his paper address book and directory enquiries as in scenarios A and B, but in addition the phone has a series of menus reachable using the arrow keys. These include an electronic 'phone book' of shortcut numbers on the phone. If Andy has stored his friend's number on his phone he can ring his friend as follows:

Scenario C (new phone only)

Andy decides to ring a friend in his electronic phone book

- C.1 Andy presses the left arrow key 
- C.2 The phone display says 'phone book'.
- C.3 He presses 'YES'
- C.4 The phone display says 'recall'
- C.5 He presses 'YES'
- C.6 The phone display says 'pos?' (requesting position in phone book)
- C.7 Andy enters the shortcut digit for his friend.
- C.8 The digit appears on the phone display
- C.9 Andy presses 'YES'
- C.10 The phone display says 'calling', as in A.4 on