

## **CS1Q Exam**

**Time allowed: 1 hour and 15 minutes**

**Answer BOTH questions.**

1.

a) Please provide BRIEF answers to the following questions:

- i) How does Task Analysis help with the design of user interfaces?
- ii) Describe two problems with formal, lab-based usability evaluations.
- iii) Describe two situations in which a mouse might be preferred over a joystick.
- iv) What impact does cognition have on human-computer interaction.
- v) What is the significance of 7 (+ or – 2) for human-computer interaction?

[2 marks per answer, 10 marks in total]

b) Describe three techniques that you would use to elicit user requirements for a new e-commerce site selling electrical appliances, such as fridges and televisions, to the public.

[3 marks]

c) Would you recommend that this web-site be extended to help users to buy goods from this site using a 3G telephone rather than a conventional PC? Justify your answer.

[5 marks]

d) The company have decided to go ahead with the development of an extended web-site to provide access via mobile devices, such as 3G telephones. Write a brief technical report describing how you would conduct a summative evaluation to assess the usability of a final implementation.

[7 marks]

## Solutions

1.

b) Please provide BRIEF answers to the following questions:

i) How does Task Analysis help with the design of user interfaces?

[Bookwork] The term task analysis refers to a range of techniques that can be used to assess the demands that particular activities place upon the user of an interactive system. Hierarchical task analysis breaks a complex activity into its simpler component steps. Cognitive task analysis can establish the ways in which users can reach particular key goals.

ii) Describe two problems with formal, lab-based usability evaluations.

[Bookwork] Lab-based evaluations can be expensive and time consuming. They usually involve recruiting potential users to interact with a system under carefully controlled conditions. Although this can help with the statistical analysis of any results it can also lead to problems in establishing that an evaluation provides valid insights into the less controlled world of a final implementation etc.

iii) Describe two situations in which a mouse might be preferred over a joystick.

[Bookwork] A mouse might be preferable where fine absolute positioning is required in contrast to joysticks that allow a rapid relative movement in relation to the current position of the cursor. In practical terms, a mouse is preferable in most office applications whilst a joystick is useful in games or in other control situations such as aviation or robotics.

iv) What impact does cognition have on human-computer interaction.

[Bookwork] Cognition can loosely be interpreted as the mental processes that are used to filter and analyse information that has already been perceived by a user. These processes are significant because they affect the interpretation of data. This depends on the users previous skills and expertise. It will also affect their ability to interact with many computer applications. Cognition controls issues such as learning and robustness in response to unexpected behaviour etc.

v) What is the significance of 7 (+ or – 2) for human-computer interaction?

[Bookwork] 7 is popularly believed to be the number of unrelated items that people can conveniently hold in short term memory. The + or – 2 refer to the impact of performance shaping factors such as noise, fatigue and distraction on that capacity. Interface designers can use knowledge of short-term memory to inform the development of an interactive system. For example; by limiting the number of menu items or form fields on an interface. Techniques such as chunking can be used to extend this capacity.

[2 marks per answer, 10 marks in total]

b) Describe three techniques that you would use to elicit user requirements for a new e-commerce site selling electrical appliances, such as fridges and televisions, to the public.

[3 marks]

[Seen/unseen problem] There are many different answers to this question. The standard solutions might focus on questionnaires, focus groups, interviews and so on. These could be targeted at the existing customers of high street stores selling similar appliances. Better solutions would focus on elicitation for web sites in particular. This raises novel problems because users need not be geographically concentrated as they would be for a conventional shop in a particular town or city. Elicitation could be focuses on existing users of on-line services. It could be targeted at the on-line users of competitor web sites. In this case there is the obvious problem of identifying these existing users of rival services. Similarly, by focusing on existing web users the results of any analysis might ignore market opportunity for new customers.

c) Would you recommend that this web-site be extended to help users to buy good from this site using a 3G telephone rather than a conventional PC? Justify your answer.

[5 marks]

[Unseen problem] Either answer is acceptable. If the solution argued against such a development then the justification should focus on the slow uptake of G3 and similar web-based mobile services. This implies a considerable risk in setting up such a service. Significant development resources may be consumed for a very small number of sales. These resources might be better spent in developing the existing retail site. Alternatively, it might be argued that these new systems offer opportunities and that there are significant benefits from being one of the first retailers in this area. In either case, it would be good to see some consideration of the problems of using a palm-top or mobile telephone device to navigate complex web sites. The card metaphor in WML that was introduced in the lectures can only go so far. If other forms of more complex, multimedia presentation are used then there remain significant questions about how to access and control these resources using small devices.

d) The company have decided to go ahead with the development of an extended web-site to provide access via mobile devices, such as 3G telephones. Write a brief technical report describing how you would conduct a summative evaluation to assess the usability of a final implementation.

[7 marks]

[Unseen problem] There are several possible solutions to this question. As in the previous part of the question, there is a distinction between the rote answers that simply consider summative evaluation without consider the application domain and those solutions that directly address summative evaluation for mobile devices, such as G3 systems. Standard summative evaluation might involve formal and informal techniques ranging from lab-based tests through to cooperative evaluation. I would not recommend the use of heuristics here in the summative stages. Better solutions might consider the issues that arise when users are geographically distributed and mobile. Issues such as signal interruption and battery loss might be considered as potential problems. Ethnographic studies and diaries might normally be used but these will tell us more about the use of the devices themselves rather than providing focussed insights into the particular ecommerce application. Logs can be kept of access onto the site and this can be linked to ordering information. However, such approaches are probably of greatest use once the site has gone live (i.e., post summative evaluation).