Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Faculty of Engineering, Mathematics and Science

School of Computer Science & Statistics

BA (Mod) Management Science & Information Systems Studies   Trinity Term 2016
Senior Sophister

CS4051 Human Computer Interaction

Tuesday 10th May 2016   Sports Centre   **14:00-16:00**

Dr Gavin Doherty

Instructions to Candidates:

Answer Question 1 and ONE other question

All questions are marked out of 50

Materials permitted in this examination: None

ALL QUESTIONS REFER TO THE FOLLOWING PASSAGE:

You are asked to design a system to support a national roadworthiness testing system for motor vehicles. The system allows drivers to book a test at a given testing centre (centres are located in many locations around the country). They also pay for the test at the time of booking. Some vehicle categories (e.g. goods vehicles) are only covered at specific testing centres. Testing centres can inspect the schedule of bookings in order to manage workload and staffing, and assign staff to particular tests. Individual staff can see their own schedule within the system. They may also have to cancel tests on occasion (in which case customers can reschedule). Customers may also reschedule tests if they provide notification early enough. An interface is provided for testing centre staff in order to enter the results of each check within the test as they inspect the vehicle. This is entered on a tablet device. Some of the checks are binary (pass/fail), but many require numbers to be entered from test equipment. The system will indicate whether these numbers are acceptable or not, giving an overall result. Some failures are considered dangerous, in which case a notice is issued that the vehicle should not be used on the road until the defects are addressed. A copy of the test result is provided to the driver. Thresholds are set by legislation and may change over time (e.g. when new vehicle emissions standards come into force). The age of the vehicle is also a factor in what checks are carried out. If a vehicle has failed, a re-test can be conducted within 30 days for a reduced fee. Retests can be booked in the same fashion as the original test. Failure rates for different checks are monitored centrally to ensure that testing centres and staff are applying the standards consistently.

You may make reasonable assumptions about aspects of the system not described in the text above, but you must document these assumptions in your answer.

Q1. All candidates **must** answer this question.

a) Identify the main tasks in the above application and present an analysis of these tasks. Your analysis should go beyond a hierarchical task decomposition.

[35 marks]

b) Explain how your analysis would affect the design of the system, giving concrete examples of the design decisions which would be influenced by the analysis. You may use a small number of user interface sketches to illustrate your answer where appropriate.

[15 marks]

Q2.

a) Describe an overall design process which you would recommend be applied in the development of the above system. Justify your choice. You should provide a plan for the activities but you do not need to consider timescales or person months.

[25 marks]

b) Identify three usability metrics relevant to the above system, explain why they are important, and how you would measure them. What values would you compare the measured results to?

[15 marks]

c) Discuss the potential roles of automation within the above system, and the difficulties which might arise from the use of automation. Your answer should consider automation within the information system, and not mechanical automation.

[10 marks]

Q3.

a) Consider opportunities for error when using the above system, and describe how they might be detected, tolerated or recovered from. Make use of the SRK framework where it is helpful to your analysis and include user-interface sketches to illustrate your answer where appropriate.

[25 marks]

b) Discuss the issue of awareness (from a CSCW perspective) with respect to the above system. Include all users within your analysis.

[15 marks]

c) Discuss whether you would use a participatory design approach for any part of the above system, and explain why.

[10 marks]