

Information & Computer Science Department
King Fahd University of Petroleum & Minerals

SWE 312: USER INTERFACE DESIGN
Group Project

Weight: 20%

Final presentations will be held in week 15

Introduction

SWE 312 User Interface Design course requires the study of both theoretical and practical issues in human computer interactions. One way to develop good understanding of the various aspects of user interface design discussed in the class is to exercise these ideas on a real life problem of **novel** nature and of **reasonable** complexity.

The main objectives of the project are

1. Create user interface designs using the components of different interaction styles
2. Evaluate user interfaces for usability
3. Follow usability engineering principles while designing user interfaces
4. Use different software tools for visual prototyping
5. Demonstrate a prototype of a project
6. Work as a team

Team Formation

All the students in the course will be divided into teams. Number of members in a team can be up to 5. Students are free to form teams. Instructor will form teams for the students who have difficulty in joining some team.

Problem Statement

Develop a user interface for “**Online pothole tracking and repair system**”. The system information document is posted in Appendix A of this document.

Work Progression

The project will be completed in phases. The phases of the project will be:

1. Development of use case model and documents, identification of user-groups and associated tasks
2. Development of a paper prototype
3. Development of a software prototype and usability evaluation
4. Improvement of software prototype; and final report and presentation

Project Evaluation

Each phase of the project will be evaluated according to the details given in the “Deliverables” section of this handout.

Programming Environment

Students are free to use any suitable programming environment for prototype development.

Deliverables

All deliverables should be submitted on due date via blackboard.

Phase 1. Development of use case model, identification of user-groups and associated tasks (25% marks) due date 17 Oct 2020 midnight

- (a) Perform user analysis by identifying the characteristics of the users (such as age, educational background etc.) (Use Appendix B template)
- (b) Perform task analysis by determining the tasks and identify the characteristics of the tasks (such as frequency, required knowledge/skill, etc.) (Use Appendix C template as supporting document)
- (c) Develop a use case model and use case documents of the system (see appendix D).
- (d) Ensure to revise your documents iteratively. (user analysis, task analysis, use case models and descriptions)

Phase 2. Development of a paper prototype (10% marks) due date 31 Oct 2020 midnight

- (a) A user interface design should be developed on paper with appropriate explanatory notes for all screens. Your evaluation of this phase will be based on use case description and task analysis of phase 1.

Phase 3. Development of an initial software prototype and usability evaluation (25%+25% marks) due date 28 Nov 2020 midnight

- (a) Develop a software prototype, which shall be high fidelity (reliability) in look, feel and breadth. Implement all the possible principles and guidelines of a good interface design. (25% marks)
- (b) Conduct usability evaluation for your software prototype to determine its strengths and weaknesses. You are required to present your prototype to other group for their feedback and evaluation. Design an evaluation strategy and provide this strategy to other group along with your interface design for evaluation. A brief description of the evaluation strategy, evaluation process, evaluation criteria and evaluation results should be included in your report. Compile and summarize the results of the evaluation. (25% marks). The instructor will decide the evaluation for each groups' work.

Phase 4. Improvement of software prototype; and final presentation (15% marks) (final presentations will be held in week 15)

- (a) Improve the software prototype by taking into consideration the usability evaluation results. Discuss what changes have been made.
- (b) Prepare a final presentation and demo for your project.
- (c) Attendance during the final presentations is mandatory
- (d) Each team will have 20 minutes for presentation, 15 minutes to show the interface and 5 minutes for general discussion
- (e) In the presentation show results from phase 1-4

Phase 1-2 Marking Scheme

Evaluation Factor	Points Given	Points	Comments
Correctness and Completeness: Document contains accurate information and it covers all applicable sections and items.		70	-
Consistency: Document shows consistency throughout the different sections.		10	
Organization: Document exhibits good organization.		10	
Writing Quality: Document contains correct spelling and grammar, and an effective writing style.		10	
Total Points		100	

Phase 3 part a Marking Scheme

Evaluation Factor	Points Given	Points	Comments
Correctness and Completeness: Document contains accurate information and it covers all applicable sections and items.		20	-
Consistency: Document shows consistency throughout the different sections.		15	
Writing Quality: Document contains correct spelling and grammar, and an effective writing style.		10	
Proper use of graphical user interfaces (buttons, Radio Buttons etc)		15	
Proper use of interaction elements (i.e. Text, Colour, Images etc)		15	
Proper use of different interaction styles (i.e. direct manipulation, menu selection etc)		15	

Is there a good use of "white space"?		10	
Total Points		100	

Phase 3 part b Marking Scheme

Evaluation Factor	Points Given	Points	Comments
Correctness and Completeness: Document contains accurate information and it covers all applicable sections and items.		20	-
Writing Quality: Document contains correct spelling and grammar, and an effective writing style.		10	
Quality of evaluation strategy		35	
Quality of evaluation process		35	
Total Points		100	

Phase 4 Marking Scheme

Evaluation Factor	Points Given	Points	Comments
Improve the software prototype by taking into consideration the usability evaluation results. Discuss what changes have been made		30	-
Prepare a final presentation and demo for your project.		70	
Total Points		100	

Appendix A: System requirements specification for the “~~Web-based~~Online pothole tracking and repair system (PHTRS)”

Ingleburn is a medium sized city in Australia, its public works department are looking to develop an online pothole tracking and repair system (PHTRS). The head of the public works programme is extremely busy, but has provided the following description of the system and its behaviour:-

Members of the public can log onto a website and report the severity and location of potholes. As potholes are reported they are logged into a “public works department repair system” and are assigned an identifying number, stored by street address, size, location on the road, area of city, and repair priority determined by size of pothole.

The general manager of the public works department prioritises and assigns the repair jobs to the available repair crew members. Work order data are associated with each pothole and includes the pothole location and size, repair crew identifying number, people on the crew, equipment assigned, hours applied to the repair, hole status which can be one of (work in progress, repaired, temporary repair, not repaired), amount of filler material and cost of repair, which is calculated using hours applied, number of people, material and equipment used.

Finally a damage file is also created to hold information about reported damage due to the potholes and includes the name and address of the member of the public reporting the damage, their phone number, type of damage, pound amount of damage.

In order to claim any damage from public works department, the member of the public submits claims to the public works department and the public works department staff verifies the claim against the reported damage. The works department staff executes the damage claims and sends a cheque to the member of the public.

The PHTRS is to be an online system which can be queried interactively by both public works department and members of the public. A member of the public can check the progress of repair work using PHTRS. A monthly progress report is sent to the public work’s headquarter. The report shows the total number of repairs requested and the total number of repairs done in a particular month. The general manager of the public works department receives two reports:

- A daily progress report that shows the total number of new repairs requested. The general manager would like to be able to sort the report based on fields of his choice.
- A daily report that shows the total number of repairs done. The general manager would like to be able to sort the report based on fields of his choice.

With the wide usage of smartphones, the public works department realize the need to make the process of reporting a pothole and submitting a claim a pleasant experience.

Appendix B: User Characteristics Template

User Characteristics	“Actor 1” Characteristics	"Actor n" Characteristics
Age		
Sex		
Physical Limitations		
Educational Background		
Computer/IT skills		
Pain points/ user requirements		
Goals		
Add at least 2 more characteristics		

Appendix C: Tasks Characteristics Template

Main Characteristics Questions	Answers
How frequently is the task carried out?	
What kinds of skills or knowledge are needed?	
Add at least 3 more questions	

Appendix D: Use Case Document Template

Use Case Number			
Use Case Name			
Author/Source			
Date of Creation			
Precondition(s)			
Successful Post Condition			
Actors			
Priority			
Related Use Cases			
Flow of Events			
Main Flow			
User Action		System Response	
UA1		SR1	
UA2		SR2	
UA3		SR3	
Alternative 1: Title			
User Action		System Response	
A1.UA1		A1.SR1	
A1.UA2		A1.SR2	
A1.UA3		A1.SR3	
Alternative 2: Title			
User Action		System Response	
A2.UA1		A2.SR1	
A2.UA2		A2.SR2	
A2.UA3		A2.SR3	