University of South Australia

Introduction

UniSA STEM

INFS 1026 – Systems Requirements and User Experience (SRUX)

Assignment 2: User Experience Design for a Paramedical Emergency Response System

Length: 2000 words or equivalent, **Weighting:** 40%, **Due Date:** See submission area
Group Assignment

To make your life easier the second assignment is going to extend what you have worked on in the first assignment. You may use any data from your first assignment that will aid in the second (and there should be a fair amount). Remember, the intention of this assignment is to identify the users and build an interface for those users. You should only include elements that directly contribute to the User Experience design. Submitting a piece of work that lumps stuff in that doesn't contribute to the quality of the user experience will be penalized. You should form groups of 2 or 3 to complete this assignment. All assignment 1 submission material for group members are able to be used for assignment 2 (but only where it makes sense).

In this assignment, you will undertake an UX design a paramedical emergency response system. A bad design might kill people. In fact, a previous ambulance system has already killed people:

(https://ifs.host.cs.st-andrews.ac.uk/Resources/CaseStudies/LondonAmbulance/LASFailure.pdf)

Note: there is a certain amount of fiction in this assignment as we don't have good access to a dispatcher or ambulance driver but do your best by roleplaying their roles. In this assignment you will create a selection of artefacts from the user experience process for the paramedics' scenario presented in Appendix 1 and using material from your first assignment. Specifically, you will create:

1. An updated set of categorised stakeholders.
2. An interview plan.
3. A project and system stakeholder interview transcript.
4. An updated set of user stories from the point of view of the user experience.
5. A set of reasonable personas/user profiles.

6. A matrix of user stories to personas.
7. A set of storyboards illustrating the context of user stories.
8. Two Information Architectures (one for the ambulance system, one for the dispatch system).
9. A priority list of user stories.
10. A prototype of both systems.

* Note that some of these items on the list are the same as assignment 1. But remember the target of this assignment is specifically for the *user experience*, so your outputs for each step may be different. You will be marked on this.

This assignment will develop your skills by allowing you to put into practice what has been taught during the entire 9 weeks of the course. If any aspect of the assignment specification is unclear, please seek clarification.

Learning outcomes

After completing this assignment, you will have learnt to:

- Identify (user and non-user) stakeholders for a given problem statement;
- Design a user interface for the users who are going to use it;
- Describe the design to level that the implementers of the system can build as intended.

Assignment and submission requirements

1. The assignment must be submitted via Learn-Online.
2. The assignment must be submitted in PDF format.
3. The assignment must be referenced where applicable using footnotes.
4. The assignment must document and justify any decisions and assumptions made.
5. The assignment submission must not include the scenario or question text from the specification.

Marking criteria

The marking rubric for this assignment will be available on the course website. Use the rubric to ensure you adequately address all aspects of the marking criteria. The word limit will not be checked for this assignment. The assignment will be assessed on the following criteria:

1. Applicability to the User Experience;
2. Completeness of solutions;
3. Clarity of expression;
4. Consistency within and between tasks;
5. Technical correctness of the methods used; and
6. Presentation, spelling, and grammar.

Task 1 – Identifying User Experience Stakeholders For Dispatch and Driver

It would be wise to look at your outputs at assignment 1 and use aspects of these to do this task. But don't just copy and paste and make sure to take assignment feedback into account. Make sure that the aspects you use support the aim of this assignment.

1. Given the provided scenario, identify the **non-user stakeholders** and **user stakeholders**.
2. For each of the stakeholders start profiling them. Get some basic information them that will help you generate personas later.

Task 2 – Interview Plan

Given the provided scenario, design an **interview outline** for an interview with the **ambulance driver** to learn how the onboard system currently works and what some of the information requirements for the new information system would be. Make sure the questions help inform you of the needs of the user/the things that currently slow them down. You should also have questions that help you understand the users to generate your personas later. Repeat this with the dispatcher.

Like assignment 1 ensure your interview outline follows the template presented in textbook (Figure 6– 2). Ensure to address the Interviewee, Location/Medium, Objectives, and Agenda elements of the template.

Task 3 – Project and System Stakeholder Interview Transcript

Write up a transcript of a (fictional) interview between yourself and two of the potential users. They should map to two of your potential persona's. It would be useful for you to have one person pretend to be the person for the interview and role play it (be the user, think like the user). Record the interaction and write down the transcript. Submit this transcript but keep the recording for verification needs. You may be asked to provide it later.

Task 4 –User Stories Relevant to the user experience

Write a set of user stories for the following users:

- Dispatcher, and
- Ambulance Driver.

Write the set of **user stories** in the form:

> As a [role|persona], I want to [goal] so that [benefit]

Ensure that your stories focus on the user experience of using the system and that your stories meet the INVEST criteria. Aim for at least 5–6 user stories per user.

Task 5 – Personas

Using the roles above come up with **three personas**:

- One for the **ambulance system** and,
- Two for the **dispatch system**.

These personas should be representative of the different groups of people who would be using the user interfaces of the system: what education, how do they solve problems, what irritates them, what do they like. This will help you to create the personas. Again, make sure you that you include aspects relevant to understanding the users interaction with the user experience.

Task 6 – Matrix of User Stories to Persona's

Create a table of mapping all the user stories you have identified to all the personas. These will allow you to see natural groupings for your designs later.

Task 7 – Storyboards

Sketch up all the user stories for the application. These are contextual storyboards so are representative of the situation the user is interacting the system.

Task 8 – Information Architecture/Look and Feel

Create a structure chart of the user stories in the user interface.
Create a short document describing the look of the final interfaces. This look and feel document should include at least,

1. Typography (font, size, etc..);
2. Colour Palette (assume full colour displays at dispatch and ambulance);
3. Iconography; and,
4. Dialog/Screen patterns.

Task 9 – Priority List of User Stories (AKA Backlog)

Once you have your list of user stories, figure out a method of calculating the priority then provide a list of the user stories with their priority in order of most to least important. Your submission should include at least:

1. What are the criteria for determining importance?
2. Ordered list of user stories.

Task 10 – Prototype

Build two prototypes of the user stories for each destination (**ambulance** and **dispatcher**) and submit. (e.g. two potential designs). Implement them using wireframing software.

The wireframes need to cover all aspects of the information architecture and therefore all identified user stories. There is no prescribed number of screens or elements as everyone's user stories and information architecture will differ. But as a guide, one screen will not produce a good user experience!

Workplan

The assignment covers topics from weeks 1–13 of the course. A suggested workplan is:

1) Read the scenario text in Appendix 1 again;
2) Read the specific elements in Appendix 2;
3) Work through each task in order;
    a. As you complete a task, assess the results as a team and improve any identified issues.
4) Finally, ensure the output of each task is consistent with previous tasks.

As you attempt a task, refer to that week's material. To achieve an HD, you should be revising all your artefacts (i.e. stakeholders, user stories, etc) as you progress and gain a better understanding of the domain; this will ensure your assignment is complete and consistent. A HD assignment will be clear how each step built on the previous step. Assignments that appear that you started with the interface and worked backward (Pretty obvious to markers) will be awarded a very low mark.

To achieve an HD, work collaboratively, not cooperatively. Collaborate closely with each other to address all 10 tasks. Do not allocate individual tasks to individual group members and design in isolation; this will result in a submission that is not consistent between tasks and will be penalised.

Extensions

Late submissions will not be accepted for this course unless an extension has been approved by the course coordinator. Late submissions that have not been approved will receive a mark of zero. Refer to the course outline for further information regarding extensions.

Academic Misconduct

This is a group assignment. You may use work of your team mates from assignment 1 only. Your submitted files will be checked against other student group submissions, and other sources, for instances of plagiarism. Students are reminded that they should be aware of the academic misconduct guidelines available from the University of South Australia website.

Deliberate academic misconduct such as plagiarism is subject to penalties. Information about Academic integrity can be found in Section 9 of the Assessment policies and procedures manual at: http://www.unisa.edu.au/policies/manual/

Appendix 1 — Assignment Scenario

The following scenario was collected from a Paramedic based in SA Ambulances. HD assignments will research beyond the following scenario description. Ensure if you do use additional sources to reference those sources of information correctly:

You have been tasked by SA Ambulance to develop the requirements for an ambulance emergency response system. SA Ambulance reports to SA Health. SA Health is responsible for general health strategy within the state.

The system will be composed of multiple terminals and computers across a wide area network. Some of these terminals will be placed within an Ambulance. The system will be responsible for handling calls coming into 000, for triaging cases, and for dispatching Ambulance Crews to cases. The system will also need to provide policies and procedure information to Paramedics on a case.

Triage

When a person calls 000 with a medical emergency, a Call Taker at a centralised call centre receives the call. A Call Taker is responsible *triaging* the calls—this is the process of assigning the degrees of urgency to decide how to handle the case. A Call Taker is not medically trained. Call Takers must follow a decision tree (which are if-this-then-that guidelines) to triage patients. The Call Taker can also give first aid advice at various points in the call based on the decision tree. The outcome of the decision tree will be a categorisation of the case between Category 1 to Category 5. Category 1 cases are urgent (e.g. choking or cardiac arrest)—these a known colloquially as “lights and sirens” cases. Category 1 cases must be addressed within 8 minutes. Category 2 cases cover, e.g., old-person with chest pains; these cases must be addressed within 18 minutes. The rest of the categories reduce in severity and urgency.

Dispatch

Once the Call Taker has categorised the case, the case will be sent to a Dispatcher. The case should appear on the Dispatcher’s computer to be assigned to an Ambulance Crew. The Dispatcher is responsible for finding an available Ambulance Crew that can take the case.

The Dispatcher must consider the urgency of the case (e.g. Category 1 versus Category 2) as well as the closeness of the Ambulance Crew. If no one is available, the Dispatcher must ask Ambulance Crews of who can be available.

Dispatchers are centralised to Headquarters spread around the state. There are dispatcher Headquarters that handle central Adelaide, Northern, Southern, and Hills regions. Cases will be sent to the nearest Headquarters. On average, there will be 20 Ambulance Crews within a Headquarters’ area.

Response

Two Paramedics form an Ambulance Crew. An Ambulance Crew is assigned an Ambulance for their shift. The Ambulance Crew will generally be on the road for their entire shift. Each ambulance will be equipped with a Mobile Data Terminal (MDT). The MDT will run the system you are developing. The MDT will receive an assigned case from dispatch and tell the Ambulance Crew where the case is. It should give an indication of the type of case (e.g. “Category 2: chest pain”).

One of the Paramedics in the Ambulance Crew will acknowledge the case. They will also signal when they are on route to the case. Paramedics will assess the cases on site.

If the case is serious, the Ambulance Crew will transport the Patient to Hospital. They will turn on lights and sirens if the case is Category 1. The Ambulance Crew must assess with their general knowledge which Hospital can take the case. The system will need to inform them of various issues at the hospital; whether a hospital is ramping (increasing , delayed, CT machine is getting repaired). The system will also need to show the paramedics the latest policies and procedures when required. For example, what are the policies and procedures around handling COVID-19.

All dates and times when key events happen must be permanently recorded for accountability and for Freedom of Information Act requests.

Paramedics work in shifts. There are four shifts a day (A, B, C, and D shift) to cover 24/7 support. Accordingly, there is no station manager. Instead, Team Leaders work in the shifts and are responsible for operations during that shift. Any system must consider the tiredness of the users in these critical cases. Team Leaders need reports of Ambulance Crew usage during the shift.

Appendix 2 – Additional Information

The two current interfaces (dispatch and ambulance MDT) are pretty old. They were designed 25 years ago and have served well but there are lots of opportunities to improve them.

Ambulance MDT

The ambulances currently are fitted with full colour displays, GPS location, data network access. But the software itself is legacy from previous system so is running as a monochrome text-based interface on the full colour display. Currently, the dispatcher sends the destination address to along with the particulars of the issue.

E.g.:

12 Main Street Mawson Lakes 5095 Call Back Number 0411000000 White house with Green Door. Go into front door turn left. Caller: Ellen Ripley Presumptive Status: Zulu Symptoms Chest pains, Drowsiness, Alien Bursting from Chest Other Notes

Presumptive Status example (this is sourced from Qatar Ambulance service):

Priority code	Unit dispatched	Urban	Rural
Priority 1 / Zulu code (Category A)	1 ambulance (Alpha Unit with 2 paramedics), 1 rapid response car (Charlie unit with 1 critical care paramedic and 1 paramedic) if available, and 1 supervisor vehicle (Delta unit with 1 paramedic) if available, moving with lights and siren. For calls outside Doha: 1 helicopter (LifeFlight).	75% < 10 minutes	95% < 15 minutes
Priority 1 / Yankee code(Category A)	1 Alpha Unit & Delta unit moving with lights and siren.		
Priority 2 / X-ray code (Category B or C)	1 Alpha unit & Delta unit if available moving without lights and siren.	75% < 15 minutes	95% < 20 minutes
Transport (Priority 3)	1 patient transport service unit (Tango) or Alpha unit moving without lights and siren.	95% < 15 minutes 20 minutes	

Dispatcher

You can assume the existing dispatch system is a basic system that takes the data entered by the 000 caller and puts it up on the dispatcher system. The existing dispatch system has a list of ambulances with statuses. The dispatcher looks at a filtered list of unallocated ambulances with their locations then selects the closest ambulance to the location and dispatches it to the scene of the accident. The dispatchers end up doing a lot of offline activities to make this work. For example, if there is a dispatch of an ambulance, they call out in the office the suburb of the dispatch so that other dispatchers know there is an ambulance going to that area. Then if another person gets one in the same suburb, they check with the first dispatcher verbally. On every dispatchers' desk there is a large-scale map of the Adelaide metropolitan area so that they can use it to figure out which ambulance to send.

Some issues that the dispatchers complain about.

1. Why do they need to know where the ambulances are? They system should at least plot them onto a map and then suggest the closest ambulance.

2. What happens when multiple people ring 000 for the same accident. The dispatchers have to realize that it's the same accident.
3. What happens if there is a high priority call and an ambulance is on its way to a priority 3 (transport) call but is close to the high priority call. The system should be able to show them this in some way.
4. The system should show them where there are holes in coverage. E.g. ambulances are waiting clustered in one area and other areas have no ambulances waiting nearby.
5. They receive a notification from the 000 operator but there is no mechanism to get clarifications from the caller before they hang up. (sometimes the dispatcher calls the caller back to ask for additional information)
6. The adding of ambulances back into the available list is manual. Requiring the dispatcher to find an ambulance in the busy list and change its status manually.