INFO2222 Usability & Security Major Assignment 1

Your major assignment in this unit will consist of 3 stages. This first stage is focused on developing a usable system. It will involve a number of iterative designs and user studies aimed at not simply designing based on theory, but actually validating that the design you select and implement is appropriate for your target users.

The second and third stages each build on this initial system, increasing and evaluating the security of the system until the final result is a ‘secure, usable system’ – ideally without changing the user experience on the front end.

This is a *group assignment* – this is partly to ensure you learn to work effectively in a group, but also because there is simply too much work for a single student. Do not try to ‘be the hero’ – share the work around, ensure you draw from all the available viewpoints in your group, and don’t be a group member who fails to contribute. We will be using a peer contribution assessment form in this unit and individual marks may be adjusted from the group mark in the event of uneven contributions.

The system itself will be a website, running on a simple web server. The technology stack we will be using is Python Bottle for the back end, running a SQLite database, and using the standard HTML5/CSS/JS front-end.

The purpose of this website is to be a knowledge repository and associated messaging service for web development. There should be content available on this website which will assist people who have questions about the topic, as well as related links to learn more. The website will have an account and messaging service, allowing users to send other users comments back and forth.

The users on the website should have 2 account roles. Any users who are not logged in may browse the full website content, but may not send comments. Regular users who have logged in may browse and send other users comments. Administrator users who have logged in may browse, send comments, and additionally may see any comments sent by any users, and control other user accounts by banning or temporarily muting their ability to send comments.

**Core Requirements:**

* Login
* Registration
* Data/Info hierarchy
  + Usability and Security Knowledge Base
  + Target Persona (your group can choose):
    - Future developers (CS students, *not* INFO2222 students)
    - Future Managers (non-CS students)
    - Casual users (general case)
* Admin and User role split
* Messaging

**Part 1 specification:**

Your first major assignment segment will be an ‘iterative’ assignment, involving at least 2 submissions prior to the actual final deadline. Please take careful note of this, and get started with enough time to make the first iteration (all schedule details are listed on the Assignment Details canvas page).

The assignment processes are quite structured – the assignment output is not. This stage is in large part a creative exercise, with the technical challenges involved in the implementation of your ideas, and the investigation of whether what you create is valid for its intended purpose. You should feel free to ‘think outside the box’ and don’t feel you need to copy the way other websites or students are doing something – so long as you validate what you do.

Many of the phases tell you to complete certain activities, like think-alouds or card sortings. You will learn how to complete each of these activities in the mini-assignments and tutorials, and will be given document templates to help you with reporting on these. You should use these skills and templates when completing these activities for this assignment also.

Each of the specified phases corresponds to a chapter in your final report. These chapters will naturally vary in length – the amount of writing is not important, what is important is that you provide the required information clearly, and show the work you have done. This could be done in 1-2 pages of writing e.g. for Phase 1, but 10-20 pages of wireframes for Phase 4. Things that occur in any single phase will often need to be added to during future phases as you learn more and realise gaps or mistakes.

The final report must be submitted in the form of a PDF, with an additional submission of a zip folder containing the web server files you have developed. As well as these submissions you will do a final demonstration of the complete web server the tutorial after the due date.

OPTIONAL: The website will need to be deployed on your group’s virtual machine for the security components of this assignment series. You may deploy your website during this stage if you wish to do so.

# Phase 1: User Investigation and the Persona

Your website will have users. Not ‘the general public’ – there’s no such thing. You must identify the specific ‘public’ you are going to be targeting. To make things (much) easier for you, you need only concern yourself with a single very specific type of user, starting with the following list:

* Future Developers (CS students, *not* INFO2222 students)
* Future Colleagues (students in fields such as business, arts, or other non-CS areas)
* Casual Users (Websites are increasingly being created casually by relatively unskilled users for small business or personal use)

Your task is to investigate your chosen group. You will likely find that the groups are still too large and complex – narrow your group down to a single persona which your research tells you is indicative of the group overall. This research will at the low end of the scale include basic web and library searching, and at the high grades forms of direct user investigation such as a survey or short interviews.

**DELIVERABLES**

* A report chapter containing:
  + A ‘persona’ document outlining your target persona
  + An outline of the user investigation processes your group has used to narrow down your persona

# Phase 2: Content gathering

Your website will in part be an information repository – which means you need information. Given the overall topic ‘web development’, you should gather information about topics like the following (you should refine this list based on what your target persona wants):

* The TCP/IP stack
* HTML/CSS front end display
* JavaScript in general, JavaScript libraries/frameworks
* Web back-ends (Python – Bottle, Flask, Django; PHP, NodeJS, Apache, Nginx, .NET, etc.)
* Hosting platforms, Wix, Google Sites, AWS, Azure, DigitalOcean, etc.
* Things you can do with websites – forms, menus, accounts, modern information displays (for example leaflet for data visualisations or embedded Google maps), etc.
* Any other information on web development you believe is relevant

**DELIVERABLES**

* A report chapter containing:
  + The content for your website: you should create this in document form before you convert it to your website and must keep it updated with any changes. Ensure you cite all sources and quote where you have copied text verbatim. Note that a collection of urls is NOT CONTENT.
  + How you linked this information to your persona’s needs

# Phase 3: Card Sorting

There will hopefully be a lot of information from phase 2 in many potential categories. As well as this, your website will need to include the following ‘user’ actions:

* Log in
* Log out
* Register new user
* View Messages
* Send Message
* [Whatever information/content based actions you feel will be useful e.g. view, search, browse]

You should organise these actions, as well as the information/content your website provides, by conducting a card sorting exercise with some of your target users.

**DELIVERABLES**

* A report chapter containing
  + A study report
  + The chosen information architecture for your website

# Phase 4: Paper Prototype & Think-Aloud

You should have enough information at this point to design your entire web server. However, don’t implement it yet! You first need to validate that your design properly serves the usability needs of your target users, and to do that you need a prototype. Develop a paper-based low fidelity prototype that outlines your interaction design and information hierarchy from top level to bottom. Evaluate this prototype using real users using the think-aloud method.

**DELIVERABLES**

* The paper prototype for your website - to be demoed in tutorial 4 (week 5)
* A report chapter containing:
  + A study report including a list of identified issues with your website design and scans/photos of your prototype pages
  + A report on how each of these issues were resolved (this will need to be filled in over time)

# Phase 5: Web Prototype & Think-Aloud

You should now focus on converting your (improved) paper prototype to the real web server. To minimise re-development pain later, you should do this incrementally, and use think-aloud testing both with developers (you) and real users to ensure you are developing a usable system.

**DELIVERABLES**

* The implemented prototype for your website to be demoed in tutorial 5 (week 6)
* A report chapter containing:
  + Study reports including a list of identified issues with your website design
  + A report on how each of these issues were resolved (this will need to be filled in over time)

# Phase 6: Finishing Touches

At this stage your website should be fully featured and technically complete – your final task is to report on the site you currently have. Because there is not much time between now and the final due date, you should not attempt to fix any usability issues discovered in this phase, but rather note them down as ‘needed work’. From a grading perspective this does rely on you having already built up a list of previously solved issues from earlier phases.

Your group must also fill in the individual contribution form indicating the relative contribution of each group member.

**DELIVERABLES**

* A individual evaluation form (submitted separately)
* A report chapter containing:
  + An evaluation of how well your website meets the needs of its target users, including how you know this, and any limitations on how well you know this
  + A list of any issues you would have liked to solve from a usability perspective, but were not able to solve for technical reasons – especially for example things that exist in your paper prototype but not in your final web server that you would have liked to include.