

Programming Studio 1

COSC3056

Milestone 2: Completed Implementation

1 Overview

The objective of the studio project is to develop a web-based application to address a **Social Challenge**. In Milestone 1 you will design and conceptualise your web-application based on a product idea that you are provided. In Milestones 2, you will develop your web-application, complete a usability test of your web-application, reflect on the feedback of your web-application and revise the implementation of your web-application. To complete the Milestone, you will need to progressively apply the skills and knowledge that you gain through Weeks 5 to 9, plus include the skills and knowledge that you gained previously in Weeks 1 to 4.

1.1 Group Work

You should continue working with the same team from Milestone 1, unless otherwise informed by course staff. You will continue to use the **team collaboration tools** from Milestone 1. In addition, you will use a GitHub repository for collaborating on your code. You must continue to use the **team collaboration tools** that we set up for Milestone 1. For this semester you **must use this MS Team to coordinate and manage your group work**. You will also be required to **evaluate** the contributions of your group partner.

You should divide the implementation between your team like Milestone 1, so that each member of the group contributes an equal amount of work. Specifically:

- Each person must *implement* one **LEVEL 1 (GREEN)** sub-task.
- Each person must *implement* one **LEVEL 2 (ORANGE)** sub-task.
- Each person must *implement* one **LEVEL 3 (RED)** sub-task.
- Each person must write *at least one* usability test.
- Each person must be a moderator for *at least one* usability test.

Your group should work together on some tasks, including:

- Implementing common Java coding elements shared across your sub-task(s).
- Optionally completing a *single* **LEVEL 4 (PURPLE)** extension task, described in Section 2.
- Refining the ER Model and Relational Schema of your *implemented* database.
- Creating a *proposed* 3NF ER Model of your database and showing the model in 3NF. Re-implementing your database to use the 3NF form is an extension task.
- Being an observer for usability testing.

1.2 Social Challenge

You should continue to work on the same Social Challenge that you used in Milestone 1.

2 Assessment Details

Milestone 2 is described in several steps in this document. You should continue to refer to Challenge Requirement Document for the sub-task descriptions.

2.1 Development & Usability Test Preparation

Milestone 2 is a progress update. You will complete a *partially functional implementation* of your web application and prepare this implementation for usability testing (that is, testing by other people). In assessing your final project and demonstration we will assess your usability testing, and review improvements you made between Milestones 1 and 2. We recommend that you complete the following by the Milestone 2 deadline:

1. Fully implemented the **LEVEL 1 (GREEN)** sub-tasks.
2. Fully implemented the **LEVEL 2 (ORANGE)** sub-tasks.
3. Commenced implementation of the **LEVEL 3 (RED)** sub-tasks. This does not need to be fully functional but are demonstration pages, such that the pages:
 - a. Have fully active web links that connect all the pages together.
 - b. Mostly complete UI (HTML/CSS).
 - c. Populate the web page with “dummy” or “simple” database queries.
4. Considered your implementation of the optional **LEVEL 4 (PURPLE)** extension task.

A key part of your development is to *refine* your UX/UI and ER Model (database) ideations from Milestone 1. We noted in Milestone 1 that your first design won't be perfect. Additionally, you will learn more concepts that you can integrate into your project throughout your coursework. Thus, as you complete your implementation, you should think about:

1. Refining your existing Personas or creating additional Personas that are better suited towards the requirements of your final website.
2. Devising Context scenario(s) and Key Path scenario(s).
3. Refining your ER Model to correct modelling issues.
4. Impacts of more using advanced SQL techniques on the design of your ER Model.

You should document your process as you refine your UX/UI and ER Model design. You **must** include as part of your Milestone 2 submission:

- Personas of key users of your website.
- Context Scenario(s) relevant to the Personas.
- ER Diagram of your *implemented* database.
- Relational Schema of your *implemented* database.
- A 20-minute YouTube video presentation link

2.2 Usability Testing

You will have other students test your web application and provide feedback. Thus, you will need to prepare the material for your usability testing. Your usability testing material must include:

1. A **Participant Information Form (PIF)**.
2. At least **three (3) Personas** of your web application. You may need to devise *new* Personas that are different from your competitive analysis.
3. **One (1) Context Scenario for each Persona**. You will need to devise these Context scenarios as you develop your usability testing

4. **One (1) task for each Persona** for the participants to complete with your web application:
 - a. Each task must be tied to the Context Scenario for the Persona.
 - b. You will need to transform the Context Scenarios into a Key Path scenario so that you can create the usability testing task plan (that is, the participant instructions).
5. A **Survey** of questions that you will ask of your participants once they complete their testing. In Milestone 2, you will submit all your preparation material for your usability testing. Moreover, you will submit the results of your usability testing results and evidence that your participants agreed to the PIF.

2.2.1 Conducting the Usability Tests

You will conduct your usability testing during class and will be a participant in the usability testing of other teams. This process is outlined below:

1. You will group up with two other teams.
2. You will conduct the usability tests of *your* web application.
3. You will participate in the usability test of *another team's* web application. You will role-play one of the other team's Persona and complete the required task(s) to the best of your ability. You should complete the other team's survey as truthfully as possible.
4. At the end of the testing, you should have:
 - a. Conducted *at least 2* usability tests for *your* web application.
 - b. Participated in *at least 2* usability tests of *another team's* web application.

The usability testing process is very important. It's imperative that you provide **good feedback** to the other teams, so that everybody can make their studio projects as good as possible.

As part of completing Milestone 2, you **must change at least one** part of your web application based on the results of your usability testing. We suggest that you **choose at least ONE issue** of your web application that the other students identified. You must **redesign and reimplement** this ONE aspect.

2.3 Proposing a 3NF Database ER Model

As part of your Milestone 2 submission, you must **propose** an ER Model (in the form of an ER Diagram) of your *implemented* database that has been normalised into 3rd Normal Form (3NF). To show your database is in 3NF, you must include all functional dependencies that you have identified and used to justify the proposed database is in 3NF.

You **are not required** to implement this ER Model (as it may require significant changes to your database). You are only required to propose what your database should be in 3NF.

2.4 Complete Web Application

In Milestone 2 you will submit:

- Your **fully completed web application**. This web application must include:
 - Your Java project containing all code source files (such as files for Java code, HTML, CSS, images, README, pom.xml, etc.). Your web application must be able to be executed by the assessors from your submission.
 - Your SQLite Database (as used in the web application and stored in the database folder)
- A PDF document containing your final **Personas**.
- For you **implemented database**:
 - An ER Diagram (PDF) that represents the ER Model.
 - The Relational Database Schema (PDF).
- An ER Diagram (PDF) representing the ER Model for your **proposed database** that has been normalised into 3NF, including all functional dependencies showing the model is 3NF.
- The results, completed PIFs, and any other supplementary material that was generated from

conducting your **usability testing**.

- Teamwork Contribution Document (XLSX).

Your *code submission* will be collected through GitHub Classrooms. The other material will be submitted on Canvas.

Your work for Milestone 2 will be assessed on:

- Levels (1-4) that you successfully implemented.
- Suitability of your UX/UI, including if your UX/UI:
 - Satisfies the needs & goals of relevant Personas through relevant Context Scenarios.
 - Satisfies Nielsen design heuristics.
 - Makes suitable use of UX/UI Design Patterns.
- Suitability of the ER Model and Relational Database Schema of your *implemented* database, including the:
 - Suitability of your ER Model, including appropriate use of attributes, entities, and cardinality and participation relations.
 - Accuracy of the representation of the ER Model in a Relational Database Schema.
 - Suitability of pre-processing the dataset for storage in the Relational Database Schema.
 - Suitability and Correctness of your SQL queries for extracting the relevant information to be displayed on your web application.
- Suitability of your ER Model for your *proposed* database that has been normalised into 3NF, including the correctness of all functional dependencies showing the model is 3NF.
- Suitability and Correctness of your Java web program.
- Usability Testing, including:
 - Preparation of usability testing material, including PIFs, Personas, Tasks, Survey questions and all relevant material to be provided to the participants.
 - Relevance of the usability tests towards the Personas and Context Scenarios.
 - Suitability of the conduct of the usability tests.

2.5 Video Presentation

In Milestone 1, you will present and demonstrate your group's project. The presentation will be recorded and uploaded as YouTube video and made available to course instructors and other students. The key question to answer in your presentation is **"how does your website achieve the goal of 'addressing the social challenge?'"**.

Your video presentation must be less than **20 minutes**.

You may structure your presentation as you wish. We recommend that you should:

1. Present how your web application satisfies the Milestone 2 marking criteria.
2. Present how your web application meets the requirements of Levels 1, 2, 3, and 4.
3. Present how the UX & UI of your web application:
 - Satisfies the needs & goals of the Personas.
 - Enables the Context Scenarios of the Personas.
 - Satisfies Nielsen design heuristics, including justifying any trade-offs.
 - Makes use of common design patterns.
4. Present how your *implemented* database:
 - Follows principles of ER modelling.
 - Enables the database to be queried using suitable SQL queries.
5. Present your proposed ER Model for your database that has been normalised into 3NF.

6. Present at least one element of your design that you changed based on your usability testing:
 - The issue identified by users while completing their usability testing.
 - The change that addressed this issue.
7. Demonstrate a run-through of using your website for the scenarios that you devised.

You may use presentation tools of your choice including:

- A slide deck (such as in PowerPoint or Keynote).
- A web browser.
- VSCode to show the code (HTML, CSS, Java & SQL) of your program as necessary.

You are welcome to watch the YouTube presentations of the other students and ask them questions. In the software industry you will regularly complete code reviews. Therefore, it's good to become comfortable with presenting your work to many other people.

2.6 Extension Tasks (Level 4 tasks)

Your group may select a *single* **LEVEL 4 (PURPLE)** extension task to complete. We have provided a list of suggestions. You may also *negotiate* an extension task with your cohort instructor. Your extension should set your project apart from all other studio projects. This is your opportunity to impress us with your skills and knowledge. To qualify as an extension, it must be a single **significant** piece work that goes well beyond the requirements of Levels 1, 2 & 3.

Our provided list of extensions:

- Significantly extend your website by researching and sourcing your own data within the context of the your Social Challenge. You will need to update your ER model, and database implementation to support the new data set. You will also need to devise a suitable UX/UI to enable users to retrieve/query information from the new data set.
- Re-implement your database according to your *proposed* 3NF ER Model. If your original ER Model is already in 3NF, then you cannot complete this extension.
- Make use of “advanced web tools” that are beyond the HTML & CSS techniques covered in the studio. These will require you to investigate methods of completing this type of work:
 - Allow users to save queries that can then be looked up by other users or that they can use again when they re-visit the website another time.
 - Dynamically generate graphs or figures.
 - Use Interactive Maps or graphs.
 - Create a mobile-friendly user experience and user interface.
 - Implement a consistent reactive UI through JavaScript and CSS libraries.

3 Teamwork Skills & Assessment of Teamwork

Teamwork is an important professional skill that you will continue to develop during the studio.

3.1 Teamwork Tools

In Milestone 2 you should continue to use the **private MS Team** that was setup during Milestone 1. In addition, you must use a **GitHub Repository (linked to the course GitHub Classroom)**, to share and manage your code with your group. We recommend that:

- You schedule regular meetings (every 2-3 days) in your private MS Team. This sets aside dedicated times for all group members:
 - Update other members on their progress.
 - Work together on aspects of the project.

- Review the Weekly Outline on Canvas, for a suggestion of how to allocate your time.

3.2 Teamwork Contribution

Each member of the group is required to contribute to each element of the assessment, and each element of the grading rubric. That is, at a minimum each team member should:

- Implement the UX/UI for their subtasks.
- Implement the SQLite database, including loading the of data to support their subtasks.
- Implement SQL queries for their subtasks.
- Prepare material for, and conduct usability testing on their subtasks.

To record each team member's contributions, you will submit a **teamwork contribution document** that outlines work of each team member. The contribution document template is linked on Canvas.

3.3 GitHub Repository & GitHub Classroom

You will use a GitHub repository to share and implement your code. This repository will be linked to the course GitHub Classroom. The GitHub Classroom link will be provided on Canvas.

3.4 Issues with Teamwork and Individual Grades

Ideally your teamwork will progress smoothly. Thus, the final grade that you will receive will reflect the quality of the entire studio project to which all team members contributed equally. If you have concerns about your teamwork, make sure you discuss these with the staff member allocated to your group **as soon as issues arise**. Do not leave this to the last minute.

However, if one member of the team doesn't sufficiently contribute, the cohort instructor may award individual grades for one or more components of the rubric. The studio project has been structured so that each member of the team has tasks they can *individually complete*. Therefore, even if your team member's work is insufficient, *you* are expected to complete *your individually allocated tasks*.

Note that individual grading:

- Is the sole determination of the instructor. Students may provide explanations if they believe they should be individually assessed, however, the instructor makes the final determination.
- Still assesses the teamwork rubric component. Students are still assessed on their *teamwork performance*. Failure to make any concerted teamwork effort may result in a grade of zero for the teamwork component for either group member.