RMIT UNIVERSITY

Programming Studio 1
COSC2803 | Semester 1 2021
Milestones 2, 3 & 4: Web Application

Assessment Type	Implementation, Usability Testing & Demonstration
	Group Assessment (pairs)
Due Date (M2)	11.59pm, Sunday 13 June 2021 (End of Week 8)
Due Date (M3)	11.59pm, Sunday 20 June 2021 (End of Week 9)
Demonstrations (M4)	Week 10, by Appointment
Silence Period (M2)	From 5.00pm, Friday 11 June 2021
Silence Period (M3 & M4)	From 5.00pm, Friday 18 June 2021
Weight	Milestone 2: 0% of the final course grade (checkpoint only)
	Milestone 3: 25% of the final course grade
	Milestone 4: 10% of the final course grade
Submission	Online, via Canvas. Submission instructions are provided on Canvas.

1 Overview

The objective of the studio project is to develop a web-based application to address a **Social Challenge** of your choice. The work that we do in Computer Science and Software Engineering is more than just coding. We use software tools to design solutions to challenging problems. In this project we endeavour to explore **Computing for Good.** That is, using our skills to achieve positive impacts with our communities and beyond.

In Milestone 1, you created your initial design for the UI and database of your web application that addresses your chosen social challenge. Across Milestones 2-4 you will complete the implementation and development of your web application. In Milestones 2 & 3 you will progressively implement and test your web application. In Milestone 4 you will demonstrate your final studio project. To complete these Milestones, 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 (Pairs / Groups of 2)

You should continue working with the same team that you formed in Milestone 1.

1.2 Group Work Assessment & Tools

You will continue to use same **team collaboration tools** as you started using in Milestone 1. In additional, you will use a GitHub repository for collaborating on your Java program. You will also be required to evaluate the contributions of your group partner.

1.3 Social Challenge Selection

You should continue to use the same social challenge that you chose for Milestone 1.

2 Assessment Details

Milestones 2, 3 & 4 are quite integrated. Therefore, all these Milestones are described in this section. You should refer to the Project Description Section of Milestone 1 for descriptions of the levels (green, orange, red and purple) for each social challenge.

2.1 Milestone 2: Prototype Development & Usability Test Preparation

In Milestone 2, you will complete an *almost fully functional implementation* of your web application and prepare this prototype for usability testing (that is, testing by other people). You will notice that Milestone 2 is worth 0 marks. This is because the preparation of Milestone 2 is a progress update. In your final demonstration we want to see the changes and improvements between Milestone 2 and your final web application in Milestone 3.

Milestone 2 focuses on implementation. While you should still be considering your users, and your database representations, the main objective is on completing your prototype implementation and preparing this prototype for usability testing. We recommend that you have the following tasks completed by the Milestone 2 submission deadline:

1. Fully implemented the **LEVEL 1 (GREEN)** web pages.
2. Fully implemented the **LEVEL 2 (ORANGE)** web pages.
3. Commenced implementation of the **LEVEL 3 (RED)** pages. This prototype does not need to be fully functional, but only act as demonstration pages.
    a. Have fully active web links that connect all the pages together.
    b. Mostly complete UI implementation
    c. Populate the web page with "dummy" or "simple" database queries
    d. The full processing and computation of the queries can be completed by Milestone 3.
4. Commenced implementation of the **LEVEL 4 (PURPLE)** task (if your team intends to complete any Level 4 tasks). Level 4 tasks are described later in Section 3.
    a. If you are expecting to complete a **LEVEL 4 (PURPLE)** extension task, it is expected that your **LEVEL 3 (RED)** pages are mostly complete by Milestone 2.

A key part of your development will be *refining* the design of your user interface and ER Model (database) from Milestone 1. We noted in Milestone 1 that your first design won't be perfect. As the studio progresses you will see more front-end and back-end concepts that you can integrate into your project. Thus, as you complete your prototype, you should think about the following:

1. Personas of the users. This could be the Personas from your competitive analysis, or additional Personas that you devise that are more suited to the requirements of your website.
2. The tasks the Personas will complete.

3. Context scenario(s) for the Persona(s).
4. More advanced design methods for ER Models and databases.
5. More advanced methods of querying databases using SQL and potential impacts of these for the design of your ER Model.

As you refine for UX/UI designs, and your ER Model, you should document this process, so that you are able to present and demonstrate your final *refined designs* during your Milestone 4 presentation. This documentation could include:

- Additional wireframe designs for revised ideations of your UX/UI.
- Paper prototypes of your UX/UI.
- A Revised ER Diagram that represents your refined ER Model.

We recommend that you divide the implementation between your team similar to Milestone 1. Of course, you may divide this work differently, and you should make sure each member of the group contributes an equal amount of work.

- Each person must *implement* one **LEVEL 1 (GREEN)** set of pages.
- Each person must *implement* one **LEVEL 2 (ORANGE)** set of pages.
- Each person must *implement* a prototype for one **LEVEL 3 (RED)** set of pages.

If your team wishes to complete any **LEVEL 4 (PURPLE)** pages, you should choose a *single* extension task to complete. All members of the team should then work together on the extension task. Extension tasks are described at the end of this section.

Finally, in Week 9, you will have other students test your web application and provide feedback. Thus, you will need to prepare the material for your usability testing (Usability testing will be covered in Week 7). Your usability testing material should include:

1. **At least 2 tasks** for the participants to complete with your web application.
   a. These tasks must be tied to the needs & goals of Personas for your website. You may need to (and are welcome to) devise *new* Personas that are different from your competitive analysis.
   b. These tasks must be tied to specific Context Scenarios for your Personas. You will need to devise these Context scenarios as you develop your usability testing.
   c. You will need to transform these Context Scenarios into Key Path scenarios so that you can fully create your task plan for your usability testing.
   d. You should write complete instructions that testers can follow.
2. A Survey of questions that you will ask of your participants once they complete their testing.
3. A complete Participant Information Form (PIF).

You will submit your PIFs and Usability testing results as part of Milestone 3. During your Milestone 4 demonstration you will need discuss the results of your usability testing.

2.2 Week 9 – Conducting the Usability Tests

In your first studio class in Week 9, you will conduct the usability testing of your web application and will test the web application(s) of multiple other teams. This process is outlined below

1. You will group up with two other groups.
2. You will iterate through:
    a. Conducting a usability test of *your* web application.
    b. Participating in the usability test of *another team's* web application. You should follow the tasks for the web application to the best of your ability and answer the questions of their survey as truthfully as possible.
3. 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 3, you **must change at least one** part of your web application based on the results of your usability testing. To do this we suggest that you **choose ONE aspect** of your web application that the other groups identified as having issues. This aspect could include:

1. One problem or limitation with UX/UI of your web application. This could include:
    a. Inability of the users to effectively carry out a Context Scenario of a Persona.
    b. Issues with usability according to Nielsen's principles.
    c. Inappropriate or incorrect use of a UI Design Pattern.
2. One problem or limitation with your database design that does not enable you to effectively represent the data required to power your website. This could include:
    a. Limitations that prevent specific queries from being supported.
    b. Limitations that fail to correctly constrain data to valid values/types.
    c. Limitations that produce data anomalies such as repetition/inconsistencies.

You must **redesign and reimplement** this ONE aspect that you have chosen. You will describe and justify the change that you make as part of your Milestone 4 presentation.

2.3   Milestone 3: Complete Web Application

In Milestone 3 you will submit:

- Your **fully completed web application.** This web application should include at least:
    o 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.
    o Your SQL Database (as used in the web application and stored in the database folder)
- The results, completed PIFs, and any other supplementary material that was generated from conducting your **usability testing.**
- Your teamwork peer review.

For reference, the *code submission* will be collected through GitHub classroom, and the *usability testing* material through Canvas, and your *teamwork peer review* assessment by a MS Form.

Your work for Milestone 3 will be assessed during your Milestone 4 presentation. It will be assessed on:

- Levels (1-4) that you successfully implemented in your web application.
- Suitability of your UX/UI, including if your UX/UI

- o Satisfies the needs & goals of relevant Personas (or intended users) through relevant Context Scenarios.
  - o Satisfies Nielsen's design principles.
  - o Makes suitable use of UX/UI Design Patterns.
- Suitability of your ER Model and Relational Database Schema (as implemented in your SQL database), including:
  - o Suitability of your ER Model for representing the provided datasets, including appropriate use of attributes, entities, and cardinality and participation relations.
  - o Accuracy of the representation of the ER Model in a Relational Database Schema.
  - o Suitability of pre-processing of the provided dataset for storage in the Relational Database Schema.
  - o Suitability and Correctness of your SQL queries for extracting the relevant information to be displayed on your web application.
- Suitability of your Java web program, including:
  - o Correctness of your Java program.
- Usability Testing Process, including:
  - o Preparation of usability testing material, including PIFs, Survey questions and all relevant material to be provided to the participants.
  - o Relevance of the usability tests towards the relevant Personas and Context Scenarios.
  - o Suitability of the conduct of the usability tests.
- Quality of your Teamwork, on the grounds of the:
  - o Organisational skills of your group members.
  - o Contributions of your group members to the project.
  - o Communication of your group members during the project.
  - o Similar to Milestone 1, you will be required to evaluate the teamwork performance of your group members.

2.4   Milestone 4: Presentation and Demonstration

In Milestone 4, you will present and demonstrate your group's project. The presentation will be made to course staff and is also open for the other students to attend. The key question to answer in your presentation is "**how does your website achieve the goal of 'addressing your social challenge?'**". Below we have provided suggestions on how you can go about answering this question.

Your presentation will be conducted in **Week 10** at a scheduled timeslot during studio/workshop classes. On-campus students will deliver their presentation in-person. Online students will deliver their presentation via a live MS Teams meeting. Your presentation should be **15 minutes**. An additional **5 minutes** will be used for questions.

You may structure your presentation as you wish. To help you prepare your presentation we recommend that during your presentation you should:

1. Present how your web application satisfied the Milestone 2-3 marking criteria.
2. Present how your web application:
   - o Satisfies the requirements of tasks for Levels 1, 2 and 3, and the optional Level 4 extension task, if you attempted to implement an extension task.
   - o Satisfies the needs & goals of the Personas (intended users).

- o Enables the Context Scenarios of the Personas.
3. Present how the UX & UI of your web application:
    - o Satisfies Nielsen's Design principles, including justifying any trade-offs made that you made in satisfying the design principles.
    - o Makes use of common design patterns, including but not limited to Navigation, Page Layout and Interaction.
4. Present how your database:
    - o Follows principles of ER modelling, and maintains the integrity and consistency of the information stored in the database.
    - o Stores all of the necessary information from the data sets.
    - o Enables the database to be queried using suitable SQL queries.
5. Present at least one element of your design that you changed based on your usability testing:
    - o You should present and/or describe the original development.
    - o The issue identified by users while completing their usability testing.
    - o The change that addressed this issue.
6. Demonstrate a run-through of using your website for the scenarios that you devised.

Your presentation will be assessed on:

- The structure of your presentation, the use of slides, diagrams, code examples, and other presentation aids.
- How well your presentation is prepared.
- How well your presentation covers the assessment criteria for Milestones 2-3.
- Whether the content of your presentation leaves the assessors (audience) with few questions.

We will be holding simultaneous presentations. Thus on-campus presentations should use your own computers. 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 attend the presentations of the other students in your cohort and support them. In the software industry you will regularly complete code reviews. Therefore, it is good to become comfortable with presenting your work to many other people.

More information on the scheduling of presentations will be provided closer to Week 10.

2.5   Extension Tasks (Level 4 tasks)

Your group may choose to complete a *single* **LEVEL 4 (PURPLE)** extension task. We have provided a list of suggestions. You may also *negotiate* an extension task with the staff member managing your project. The goal of the extension task is to set your project apart from all other studio projects. This is your opportunity to impress us with your skills and knowledge. Your group may select only a *single* extension task.

To qualify as an extension, the chosen task must be a single piece of significant work that goes well beyond the requirements of Levels 1, 2 & 3. **You must confirm** with your staff member that your chosen task qualifies as an extension task. This should be done during the portfolio reviews held in Weeks 6 & 7.

Some suggestions of an extension include:

- Revisit your perspective on your chosen social challenge from your competitive analysis. If this perspective would cater to significantly different users and tasks compared to those provided in Levels 1, 2 & 3, then for this extension task you may add a section of your site that is highly targeted toward that perspective. The key to this type of extension is "significantly different" and "highly targeted". You will need to justify this by showing:
    - Suitable Personas.
    - Suitable Tasks and context scenarios that support the Personas' needs & goals.
    - These Personas, tasks and scenarios are not automatically or easily supported by the existing implementation of the site.
- Significantly extend the data set and include additional "deep-dive" queries to a user of highly important and relevant trends within the data asset that are not highlighted by the existing Level 1, 2 & 3 queries. This will require you to research your own additional data sets. This research could also include cleaning up any inconsistencies in the original data sets, such as issues with LGA codes in the Homeless data set. These queries must align to suitable Personas you have devised that require this information.
- Significantly improve the database design using normalisation techniques. This will require you to review the normalisation content on your own individually before it is covered in class, as normalisation will be covered very close to the Milestone 3 submission deadline.
- Make use of "advanced web tools" that are beyond the simpler HTML & CSS techniques taught in Studio 1. Examples are given below. 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 reactive UI through existing Javascript and CSS libraries.

3   Teamwork Skills & Assessment of Teamwork

An important professional skill that you will be continuing to develop during the studio is teamwork. You will continue to use team collaboration tools. You will be *assessed* on your teamwork, and you will evaluate the teamwork and contribution of your other team member(s).

3.1   Teamwork Tools

You should continue to use the teamwork tools for Milestone 1, plus using GitHub:

1. MS Teams for group discussions.
2. Task Planner for tracking the tasks of each milestone.
3. ***A GitHub Repository (linked to GitHub a Classroom for the Studio Project)***

Across Milestones 2, 3 & 4, you will be required to make use of these teamwork elements. In particular, you are required to use the Task Planner to:

- Allocate tasks to each person individually.
- Allocate tasks that both people must complete together.
- Set a date that each task is due. You should pick reasonable dates so that this milestone can be completed and submitted on time.

Part of your teamwork assessment will be based on your use of MS Teams and the Task Planner.

3.2   GitHub Repository & GitHub Classroom

From Milestone 2 onwards, you will use a GitHub repository to share and implement your code. This repository will be linked to a GitHub Classroom. The link to the GitHub classroom will be provided on Canvas.

3.3   Teamwork Peer Assessment

As part of your teamwork, you will need to complete a peer review of the teamwork of the other member(s) of your team. The link to this review form will be placed on the Canvas in Week 9. This should be a fair and honest assessment of their contribution to the studio project, and how they collaborated with you over the course of the studio project.

3.4   Issues with Teamwork and Individual Grades

In an ideal world, your teamwork will progress smoothly. Thus, the final grade that you will receive will reflect the quality of the entire studio project to which both team members contributed equally.

However, if one member of the team doesn't sufficiently contribute, we may instead award individual grades for the components of the rubric. The studio project has been structured so that each member of the team has a set of pages on which they will individually work. You are expected to work on *your individual pages*. Therefore, if there are problems with teamwork, we (the assessors) may choose to assess just your individual work. Therefore, it is important that, even if your team member does not do their work, *you* are expected to complete *your allocated pages* to the best of your ability.

If you have concerns about your studio project and your teamwork, you should make sure you discuss these with your tutor as soon as issues arise. Do not leave this to the last minute.

4   Submission

Follow the instructions on Canvas to complete your submission for the project for each Milestone.

4.1   Milestone 2 Submission

You will need to submit:

- Code (via GitHub Classrooms).
- Usability testing preparation material.

4.2   Milestone 3 Submission

You will need to submit:

- Code (via GitHub Classrooms).

- Results of your usability testing.
- Completed PIFs of your usability testing participants.

4.3 Milestone 4 Submission

You will need to submit:

- Materials used for your presentation, such as your slide deck.

4.4 Assessment Declaration

When you submit work electronically, you agree to the RMIT assessment declaration.

4.5 Silence Period

For **Milestone 2**, a silence period will take effect from 5.00pm, Friday 11 June 2021.

For **Milestones 3 & 4**, a silence period will take effect from 5.00pm, Friday 18 June 2021.

This means questions about this assignment will be not answered, whether they are asked on MS Teams, by email, or in person. The silence period is in place because staff members are generally unavailable over the weekend. Additionally, to be fair to all students giving presentations, we will not respond to questions about the Milestone 4 presentations during Week 10. Therefore, you should make sure you ask your questions about the demonstrations **in Week 9**.

Make sure you ask your questions with plenty of time for them to be answered.

4.6 Late Submissions & Extensions

A penalty of 10% per day is applied to late submissions up to 5 business days, after which you will receive zero marks.

Short extensions may be granted by the course coordinator up to 1 day before the due date in accordance with RMIT Assessment Adjustment process. However, extensions are not guaranteed and require suitable documentation. The course coordinator may refer requests to Special Considerations.

Special Considerations that have been granted *may result in an equivalent assessment*, which may take the form of a timed assessment, assessing the same knowledge and skills of the assignment. For more information refer to the RMIT Special Consideration process.

5 Marking Guidelines

5.1 Milestone 2

There are no marks for Milestone 2 as it is a progress update and preparation for your usability testing.

5.2 Milestone 3

The marks are divided into the following categories:

- Implementation & Programming:
  - UX & UI 5/15
  - Database 5/15
  - Java Programming 5/25
- Usability Testing 5/25

- Teamwork & peer assessment 5/25

The detailed breakdown of the marking guideline is provided on the rubric available on Canvas.

5.3   Milestone 4

The marks are divided into the following categories:

- Presentation Skills 5/10
- Coverage & Questions 5/10

The detailed breakdown of the marking guideline is provided on the rubric available on Canvas.

6   Academic Integrity and Plagiarism (Standard Warning)

Academic integrity is about the honest presentation of your academic work. It means acknowledging the work of others while developing your own insights, knowledge and ideas. You should take extreme care that you have:

- Acknowledged words, data, diagrams, models, frameworks and/or ideas of others you have quoted (i.e., directly copied), summarised, paraphrased, discussed or mentioned in your assessment through the appropriate referencing methods
- Provided a reference list of the publication details so your reader can locate the source if necessary. This includes material taken from Internet sites. If you do not acknowledge the sources of your material, you may be accused of plagiarism because you have passed off the work and ideas of another person without appropriate referencing, as if they were your own.

RMIT University treats plagiarism as a very serious offence constituting misconduct. Plagiarism covers a variety of inappropriate behaviours, including:

- Failure to properly document a source
- Copyright material from the internet or databases
- Collusion between students

For further information on our policies and procedures, please refer to the RMIT Academic Integrity Website.

The penalty for plagiarised assignments includes zero marks for that assignment, or failure for this course. Please keep in mind that RMIT University uses plagiarism detection software.