# IM3080 Design and Innovation Project (AY2021/22 Semester 2)
# Individual Report

**Name:** Guo Xinying (Group Leader)
**Group No:** Group 1
**Project Title:** Focus – A Highly Customizable One-Stage Time Management App

**Contributions to the Project** (1 page)

- *Brainstorming*
  1. Came up with a few existing time management apps and their limitations. Prompted corresponding improvements. Analyzed the feasibility of using uWave as our reference app. Analyzed its page structure, key features, and use cases to prepare for version 1 implementation.
  2. Investigated the data visualization method of existing task management apps. Proposed a gamification data visualization method with multi-user interactions.
  3. Designed use case scenarios for both the calendar part and gamification progress tracking part.
- *UI Design*
  1. Defined colour palette and fonts according to the theme and user needs. Designed and drew 2 pixelated avatars for users to choose from. Designed and drew the game page background and activation effects.
  2. Planned navigations between timetable and game pages (and their subpages).
  3. Designed and drew the following components and pages using Figma:
     - top/bottom bar, header, task/event/deadline card, calendar/to-do-list container.
     - timetable page, game page (and their subpages).
  4. Made our project poster and publicity video using Canvas and AE.
- *Frontend Development*
  1. Designed and coded the following pages using Expo CLI (JavaScript):
     - Implemented the calendar add and delete function, to-do-list add and delete function, and page navigation function with the following JavaScript files: TopBar.js, TimetableScreen.js, DeadlineCard.js, EventCard.js, TaskCard.js, TimeTableContainer.js, TodoContainer.js, TodoList.js, AddInput.js
     - Implemented the avatar position updating function, firework triggering function, and game component rendering function with the following JavaScript files: GameScreen.js, Global.js, renderers.js, systems.js
  2. Adjusted CSS/JS styles to provide better UI presentation and user experiences.
- *Backend Development*
  1. Designed and optimized data schema (name, type, rule, description) for storing and retrieving data between pages.
  2. Edited Firebase interfaces between calendar, to-do-list, and add pages components.
- *Project Management*
  1. Presented weekly progress to professors. Made slides, recorded demo videos, and summarized professors' feedback. Documented everything in Google shared folders.
  2. Organized two weekly meetings for project development. Assigned tasks and recorded everyone's progress using Notion (a task management dashboard).
  3. Made weekly and monthly plans, set aside a buffer period, and monitored the quality and progress of the project in real-time to ensure that the project can achieve the expected objectives on time. GitHub maintenance.
  4. Actively communicated with members to ensure efficient and pleasant cooperation. When meeting urgent problems, communicated in Telegram chat in time.

**Reflection on Learning Outcome Attainment**

**Reflect on your experience during your project and the achievements you have relating to at least two of the points below:**

(a) Engineering Knowledge
(b) Problem Analysis
(c) Investigation
(d) Design/development of Solutions
(e) Modern Tool Usage
(f) The Engineer and Society
(g) Environment and Sustainability
(h) Ethics
(i) Individual and Teamwork
(j) Communication
(k) Project Management and Finance
(l) Lifelong Learning

- *Point (a): Engineering Knowledge*

Through this project, I have experienced a complete mobile app development process and gained a lot. First, I have a better understanding of the app development process. I will summarize the whole process into the following three stages: functional requirements stage, app development stage and app launch stage. Taking the functional requirements stage as an example, we need to conduct requirements discussion, requirements evaluation and UI design. Before development, we need to fully communicate with customers to understand the type, platform, function, budget, and other aspects of the app that customers want to develop, to formulate a detailed scheme. We also need to discuss the feasibility of the scheme with front-end and back-end developers, including the difficulty of function development, the cost, and the time of actual development. In the app development stage, we need to go through front-end development, program development, interface development and other processes, and then debug and repair. In the final launch stage, we need to prepare marketing materials for review and publicity. Secondly, I learned a new programming language: JavaScript. Through the cooperation of React Native framework and JavaScript, I have a certain understanding of mobile app coding and debugging. The hot update, cross-platform, and convenience of React Native also gave me a new impression and pursuit of app development.

- *Point (b): Problem Analysis*

We have encountered many problems in the process of software development. Only by excavating the core and root of the problem can we propose to improve or improve the process to avoid similar problems from happening again. I summarized two useful ways of thinking: 5WHY analysis and the first principal analysis. On the former, we can ask ourselves these three questions: First, why did it happen? (From the perspective of "manufacturing"). Second, why didn't you find it? (From the perspective of "inspection"). Third, why didn't accidents be prevented systematically? (From the perspective of "system" or "process"). In this way, we can conduct a more in-depth analysis of the problems. As for the latter, I think we should grasp the essence of the problem in the development process. For example, when I encounter problems in development, in most cases before, I would read some blog articles, but I often read them for a long time and can't find a solution. At this time, if I use the first principle, I can go to read the source code, SDK, and official documents, and I can often solve the problem more efficiently. In addition, we often read some excellent open-source project codes and often find some excellent architecture or writing methods. At this time, we

can also use the first principle to think about the principle and the root cause of this writing method, which will often be traced back to the design pattern or architecture pattern. Then we can go deep into its root causes.

### *Point (e): Modern Tool Usage*

Through this project, I learned some new development tools. The first is Figma, which is a cross-platform collaborative UI design tool. It supports historical version recovery and element positioning. It can be used based on the browser without installing locally. I used Figma to design some pages and the navigation logics between these pages. The effect is very good, and the UI template can be produced efficiently, which is convenient for subsequent display and modification. The second is Expo CLI, which has low requirements for the environment and supports hot updates. It is very suitable for developing lightweight apps like ours. Then there is the use of Notion and GitHub. For team cooperation projects, the Notion can clearly see the completion of each person's task, and it is a good tool for project management. GitHub well integrates everyone's code through git, making the development process more concise.

### *Point (i): Individual and Teamwork*

As a team leader, I gained a lot in this team cooperation. In order to cooperate efficiently and happily, I learned about the abilities of each student, assigned appropriate tasks to everyone, adjusted the team atmosphere, stabilized everyone's pace, regularly summarized everyone's achievements, and provided a clear and reasonable plan for everyone.

Here are my views on individual work and teamwork: working independently and teamwork have their own advantages and disadvantages. For personal work, I can work at my own pace instead of relying on others. I can concentrate more easily and speed up my work because there is no communication with others and additional meetings. You are the only person in charge of this position. I enjoy all the benefits, but I also bear all the risks. No one else can motivate you to complete the task. No one can talk to them, share ideas or get help. For teamwork. It can increase collaboration and allow brainstorming. Teamwork develops more ideas and improves productivity. And everyone is unique, with different skills, backgrounds, and experiences. Therefore, others in the team can see things from different perspectives. Teamwork encourages communication among team members, but decisions may take longer to reach a consensus. The power of teamwork is far greater than that of individual cooperation. The team not only emphasizes the individual work results but also emphasizes the overall performance of the team. What the team relies on is not only collective discussion and decision-making but also the collaborative implementation and joint contribution of members.