Implementation

This chapter claims implementations done by the team. It includes decisions the team made and high-fidelity prototypes. Team has decided the software’s platform, programming language, software framework, development tools and IDE according to technical research and stakeholders’ preference. Version control and teamwork tools are applied to help validate the workflow, file sharing and team management. Results and analysis are presented in section 5.1. Section 5.2 will show the prototypes.

5.1 Key Implementation Decisions

After technical research, Team 10 has gained some knowledge about the fundamental of building software with animation. Therefore, initial decisions about how to implement such software are divided into five parts. The platform is initially decided to be the Windows system. Web will be the programming base, and IntelliJ Idea will be used as the IDE. Git with GitHub is the version control tool and team management tool.

5.1.1 Platform

Among 4 frequently-used platforms, PC (macOS/Windows), mobile terminals (iOS or Android), web and WeChat Mini Program, team 10 has made a choice. After analysing each platform, WeChat Mini Program and mobile terminal were excluded from the list due to the small size of their adaptive devices. The web is not considered because using cookies may lead to serious privacy problems. Besides, according to the questionnaire results, PC is more welcomed among our stakeholders. After considering both platforms’ features and stakeholders’ opinions, the PC platform is chosen.

5.1.2 Programming Language and Software Framework

Front-end

The project focuses on the animation, which requires a strong front-end tool. Although AWT, Swing and JavaFX can work with Java to provide a user interface, the restriction on UI design and functionalities make it less attractive. In comparison, HTML5 and CSS work well for designing UI freely. Existing learning resources are sufficient on the Internet as well. Moreover, it splits front and back ends, which further specifies the division of labour of the team and improve efficiency. Therefore, the team would choose HTML and CSS as the front-end languages for the development of UI.

Back-end

The project will contain several classes and objects for handling events and businesses which supports the service behind those events. JavaScript is supported well by most of the modern browsers but is hard to write code of business part. C# is fully functional and has plentiful resources to refer to. However, supporting Windows platform only makes this language less attractive. Java can be parsed and run on multiple platforms efficiently. It is also powerful in explaining animations and reacting to user actions. Being an object-oriented language also makes it easy to handle different events of objects. Therefore, the primary decision of the programming language of the back end would be Java.

5.1.3 Development Tools and Methodology

Build Project

Gradle is used for building the software. As for the usability of Gradle, it is a software project management and comprehension tool. It can manage a project’s build on any platform, also deliver software automatically and quickly from end to end based on its rich API and mature ecosystem.

Software Development Methodology

Since it is a small development team, and customer involvement is needed, the Agile project management approach will be used to embrace changes to requirements, delivers and frequent releases.

Specifically, Scrum will be used to contain a set of tasks to trace the work. During the development process, Sprints will be planned based on the backlogs which are made during the meeting. Informal meetings and daily stand-ups will be held to make sure the efficiency of the team.

5.1.4 Integrated Development Environment

After technical research of IntelliJ IDEA and Eclipse, IntelliJ IDEA is selected as the ultimate development management, such as convenient git project management. IntelliJ IDEA also supports automatic code generation and ZenCoding. Writing HTML would be convenient. IntelliJ IDEA also better supports for JS, CSS and plug-ins than Eclipse. Since this project is a Java Web project, the team would choose IntelliJ IDEA.

5.1.5 Version Control and Team Management

As for code quality, it is planned to utilise systematic methods to guarantee it during the whole process. Coding convention, including comment, naming, indentation, and changelog will be confirmed at the beginning.

Git will be used as a version control tool and Github will be the platform. In detail, the software will be developed using a test-driven development approach, and pair programming is deployed to avoid basic mistakes. As for management tools, the team is managed by several useful GitHub features such as “Project”. Issues with labels are used to raise questions, distribute tasks, alert bugs. Kanban is a clear and visible feature for managing tasks showing the whole process at the same time. Milestones will be used for making stage-based objectives with due time, to improve productivity.