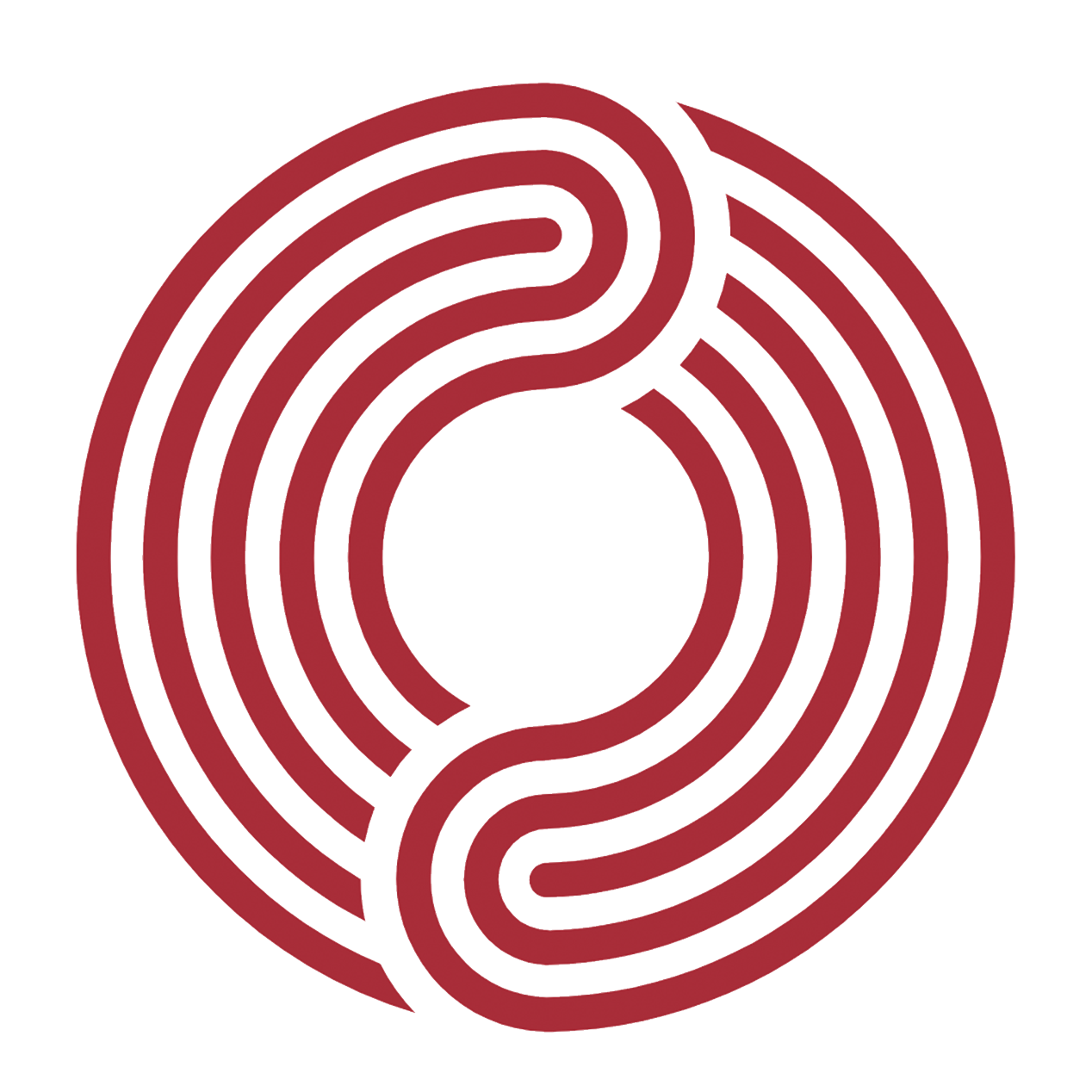
Logo

Description automatically generated

**Freewheelin' Process Document**

4th Iteration

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# 1 Prototypes

## 1.1 Goal of Cycle

The goal of this iteration is to produce a version of **more professional PC adaptive software** that is naturally in line with the demand of **professional pc users** based on the result of the questionnaires and other **evaluation techniques** (Heuristic evaluation, Cognitive walkthrough, and so on) applied in last iteration cycle. The enhanced interactive software can take advantage of **the additional visual and operational area** empowered by pc, as well as coinciding with the pc interaction logic. For example, the top functional menu bar, which is not appropriate for tablets and mobile phones, however enabling the pc user to acquire a consistent and aggregated experience. Also, interactions like keyboard control and timeline editing will be incorporated into this iteration of ***FreeWheelin’*** software.

The reason why the specified pc version is set as the prioritized goal of this round is that although the tablet version of the software can be used on pc due to the similar screen size and proportion, **nonetheless**, the way people **interacted** with pc and tablets is quite different (many factors contribute to it, mostly due to the differences in terms of io devices). Combined with the feedback given on the questionnaire, ***FreeWheelin’*** development team choose this as the prioritized goal of this iteration, aiming to give users a **consistent but customized experience** in every **mainstream** platform.

## 1.2 Prototyping Techniques

### 1.2.1 The name of the techniques

1. Wireframing

2. Native (a completed interactive executable software)

3. Paper Prototypes (Video)

We shoot a video to show the process of the click events in our software to make the user interface and the developers understand the whole procedure clearly.

You can see this video in our resources folder or via this link:

<https://leeds365-my.sharepoint.com/:v:/g/personal/sc20yl2_leeds_ac_uk/EdxtAvmweHpCia5zSGUHb0YB-stAl0obIlvee17EireQmQ?e=21Lm46>

### 1.2.2 Software used

In these four techniques, there is plenty of software we used. All software has been listed below.

|  |  |
| --- | --- |
| **Software** | **Usage** |
| GoodNotes | It is used to illustrate rough ideas with iPad and Apple Pencil. |
| Moqups | A software to sketch the wireframe in a web. |
| Adobe Premiere | We use Adobe Premiere to edit our paper prototypes (video). |
| Qt Designer | It is used to design the UI of software and create the QSS file. |
| Clion | It is used to develop the Software. |

## 1.3 Theoretical Motivations

Having iterated (faithfully followed the **interaction design life cycle** (Est, 2022)) for three cycles already, combined with the feedback gathered from the questionnaire and interview, it is indispensable to incorporate some theoretical motivations to further dig the user demand and consider thoroughly. Below are some theoretical motivations for this iteration.

1. Solving common problems in prototyping with **recurring solutions.** The code and templates we composed in preceding iterations can be used to accelerate this iteration and the robustness is guaranteed.
2. The **Affordance theory** (Nye, 2012) helps us to redesign the functional distribution of buttons, giving intuitive feedback and rejections at the appropriate time
3. Taking advantage of **constructivism**, indicating some scroll area and operational area without explicitly remaining the pc user, since the design is consistent with professional pc software.
4. Using **color theory** (Morton, 2014) to distinguish the software. We carefully choose the color set to be by the intent of our software, indicating the user with a psychological hint, fitting in with the workflow.
5. **Proper selection of interaction method.** This is the explicit **theoretical** motivation for this iteration. Although the PC and tablet end sizes are very similar, their **operation mode** is completely different due to the discrepancies in Io devices. For example, tablet users tend to use **the hand or stylus** to operate, so converged functions are close to each other in a PC is not feasible in the tablet. At the same time, we want to make good use of **keyboard shortcuts** to help professional users better achieve the desired functions
6. **The user-centered approach** led to the emergence of the PC end. This naturally appeared and caught user demand since we obey the user-centered approach in all iterations.

## 1. 4 Working Technique

We chose **agile development** as our main working principle and framework.

### 1.4.1 Justifications

Choosing the Agile development

By Applying agile development, due to the incremental delivery nature of agile development, we have already gained three versions of software containing the initial Tomeo-enhanced version, the tablet-oriented version, and the mobile phone-suitable version. All these previous versions helped the team to identify the pros and cons instantly after each sprint, exchanging and gathering ideas from users and team members, which accelerated and modulated the development and evaluation process.

### 1.4.2 Evidence for the chosen working technique

|  |  |
| --- | --- |
| A picture containing graphical user interface  Description automatically generated | Why Choose Agile for Project Management |
| Figure 1. screenshots of the Kanban board | Figure 2. Agile Method |

## 1.5 The design, the process, and evolution

After the last evaluation, we found that there exists an obvious and feasible demand from the pro PC users, so we agilely invited them again to join us to design the PC edition. First, we list a list of stuff on what they wanted and ranked the priority, then we interactively sketched the paper prototype of the software. After scrutinizing the details, we refined the paper wireframe into a professional one, taking advantage of the mockup wireframing software. Below is an illustration of the software

|  |  |
| --- | --- |
| **Sketches** | **Wireframes** |
| 图示  中度可信度描述已自动生成 | 图形用户界面  描述已自动生成 |
| Figure 3. sketches mobile index | Figure 4. wireframe mobile index |
| 图示  描述已自动生成 | 图形用户界面  描述已自动生成 |
| Figure 5. sketches PC index | Figure 6. wireframe PC index |
| 图示, 工程绘图  描述已自动生成 | 图形用户界面  描述已自动生成 |
| Figure 7. sketches edit duration | Figure 8. wireframe edit duration |
|  |  |
| Figure 9. sketches full screen | Figure 10. wireframe full screen |
|  | 图形用户界面  描述已自动生成 |
| Figure 11. sketches PC menu | Figure 12. wireframe PC menu |
| 图示, 工程绘图  描述已自动生成 |  |
| Figure 13. sketches PC edit duration | Figure 14. wireframe PC edit duration |
| 图示  中度可信度描述已自动生成 |  |
| Figure 15. sketches PC full screen | Figure 16. wireframe PC full screen |

We refined and enriched every detail in the paper wireframe and finally used professional design software, mockups, to compose a more high-fidelity wireframe prototype. Then we faithfully followed the wireframe and used C++ with Qt designer to implement the **MVP** (software).

# 2 Code

|  |  |
| --- | --- |
| **Design** | **Implementation** |
| 图形用户界面  描述已自动生成 | 截图里有图片  描述已自动生成 |
| Figure 17. wireframe mobile index | Figure 18. software PC full screen |
| 图形用户界面  描述已自动生成 | 电脑萤幕的截图  描述已自动生成 |
| Figure 19. wireframe tablet index | Figure 20. software tablet index |
| 图形用户界面  描述已自动生成 | 电脑萤幕的截图  描述已自动生成 |
| Figure 21. wireframe tablets edit duration | Figure 22. software tablets edit duration |
|  | 躺在沙滩上  描述已自动生成 |
| Figure 23. wireframe tablets full screen | Figure 24. software tablets full screen |
| 图形用户界面  描述已自动生成 | 电脑萤幕的截图  描述已自动生成 |
| Figure 25. wireframe PC index | Figure 26. software PC index |
|  | 电视萤幕的截图  描述已自动生成 |
| Figure 27. wireframe PC edit duration | Figure 28. software PC edit duration |
|  | 躺在沙滩上  描述已自动生成 |
| Figure 29. wireframe PC full screen | Figure 30. software PC full screen |

# 3.Evaluation

## 3.1 Evaluation Techniques

Techniques applied in this iteration:

1. Cognitive walkthrough (After wireframe and through the software design process)
2. Heuristic evaluation (by UI- knowledge backed cs students)
3. Usability Tests
4. Questionnaires

## 3.2 Justifications for Evaluation Techniques

For the last three iterations, we applied **cognitive walkthrough** instantly after the wireframing process and software design process, obtaining instant feedback by allowing the evaluator(interviewee) to “**Think Aloud**” during the evaluation process. Based on the ideas of the interviewee, informative feedback can be gathered instantly.

For Heuristic evaluation (Interaction Design Foundation, 2019), we have made the process in a detailed way and **documented it** properly, and the 10 basic criteria have been detailly checked to ensure the software can meet the higher standard. We also carried out **Usability tests** by selecting a representative user to use the software and identifying the issues existing in the software.

## 3.3 Outcomes of the Evaluation

The general outcome of this iteration is accepted. The evidence is attached below.

## 3.4 Evidence of the Evaluation

We invited all team members and some interested users to evaluate our software (14 people), and we prompt some basic tables for them. The anonymous result is presented as follows.

|  |  |  |
| --- | --- | --- |
| **Criterion** | **Accept** | **Reject** |
| Cognitive walkthrough | 13 | 1 |
| Heuristic evaluation | 14 | 0 |
| Usability Tests | 14 | 0 |
| General Evaluation | 10 | 0 |

## 3.5 Questionnaire Survey

We used a questionnaire to evaluate our iteration. We randomly surveyed 20 users in this questionnaire survey to rate and evaluate our software. In addition, the content of our questionnaire conforms to the code of ethics and morality. We do not collect any sensitive information about users.

### 3.5.1 Current Version

In this software iteration, we have increased the adaptation to PC. And keep the original tablet and mobile. As can be seen from the data below, most interviewees think that our PC software has an excellent user experience and relatively complete functions, and the newly added function of video clip duration on the tablet is also very popular among users.

|  |  |
| --- | --- |
|  | 图表  描述已自动生成 |
| Figure 31. The marks on tablet version | Figure 32. The marks on PC version |

### 3.5.2 Next Version

The content in the latter part of the questionnaire points out the direction for our fifth iteration. Most users agree that software must consider Accessibility and Internationalization. And think that our software should also consider doing these two aspects of optimization. According to the results of the questionnaire, we decided to focus more on Accessibility and Internationalization in the next software iteration.

|  |  |
| --- | --- |
| 表格  描述已自动生成 | 图表, 条形图  描述已自动生成 |
| Figure 33. The results on Accessibility | Figure 34. The results on Internationalization |

### 3.5.3 More Results

We have uploaded all results to our project folder. You can view all questionnaire results in that folder.

# Reference

Interaction Design Foundation (2019). *What is Heuristic Evaluation?* [online] The Interaction Design Foundation. Available at: https://www.interaction-design.org/literature/topics/heuristic-evaluation [Accessed 18 Dec. 2022].

Morton, J.L. (2014). *Basic Color Theory*. [online] Colormatters.com. Available at: https://www.colormatters.com/color-and-design/basic-color-theory [Accessed 18 Dec. 2022].

Nye, B.D. and Silverman, B.G. (2012). Affordance. *Encyclopedia of the Sciences of Learning*, pp.179–183. doi:10.1007/978-1-4419-1428-6\_369.

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