City University of Hong Kong

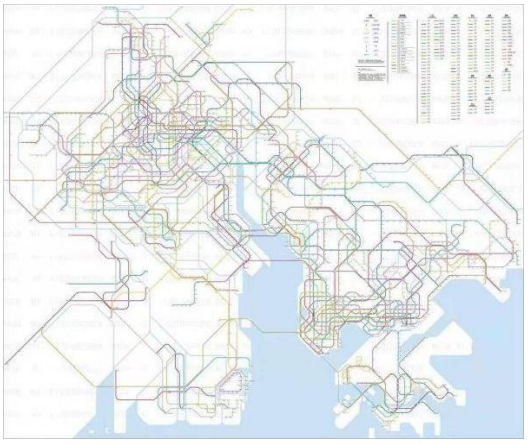
Department of Computer Science

CS3343 Software Engineering Practice

2021/22 Semester A

Hong Kong-Shenzhen Metro Route Planning System in Greater Bay Area

Self Assessment Report



Project Group 6

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1 HUANG Yuqin

Through this course and project, despite experiencing a complete life cycle of a project, the most significant thing that I have learned is how to work as a team systematically and methodically.

As efficiency determines success, we spent lots of time communicating, with a regular meeting every week and some daily talks between teammates whose work is closely related. For instance, I am responsible for developing the core algorithms and front-end testing. So, in addition to reporting my progress and the discussing plan for the following week, I also checked the consistency with another teammate who was responsible for reading in data every few days. Therefore, we were able to do work with sequence concurrently without error, which improved the efficiency. In this case, everyone in our team knew clearly what we should do ourselves and had a general understanding of the work of other team members. As a result, every step we did count, and the whole process went smoothly and efficiently.

Before taking this course, I thought the focus would be algorithms, which I believe is an opinion for lots of people towards IT projects. However, now I understand that although algorithms are vital, the thing that can largely determine the success or failure of a project is project management. And what I have mentioned above is also a part of it. The communication and planning we do and the documents we write matter.

Moreover, doing this project made me deeply realize again that easy concepts can be hard to apply well into practice. It is pretty straightforward when drawing simple diagrams of the testing structure and using blocks to represent code modules. However, when it comes to designing the framework of our own project testing, a large number of code blocks and their mutual relations make the process much more complicated.

Overall, I reckon that what I have learned in this project work is priceless. The project management skills, the integrated and detailed processes of a complete project, the ways to work together with our classmates, how to solve problems effectively and efficiently etc., are all the things I have learned.

2 LIU Wei

In this project, I worked for UI design, programming and testing with my partners. We have a complete experience in project development and learned a lot in project management, team working, java programming and testing procedure.

Working in a team is quite a big challenge for us. We need to compromise with each other from time to time. For example, at the beginning of our project, we have a 2-hour discussion about the topic choice. Everyone has their own idea and thinking. It is impossible to choose them all, so all of us tried to think from different directions and finally accept our final topic. In team working, we cannot always stick to our own opinion and refuse to accept others, instead, we should think more, ask more and agree more. However, it does not mean that we simply listen to others without our own ideas. Team work needs everyone's participation and contribution. Also, communication is important. Luckily, our team did a good job in this part with good coordination of our team leader.

Prototype design and frame construction are important at the first phase. It is likely to cause trouble if the core programming starts without careful and clear class structure. When we realized the problem, we put lots of effort on overall project structure design and have a satisfying project frame complying to modern and professional principles. Also, the complete class diagram has significantly reduced the time cost for main programming and testing.

During our project development, we have a complete practical testing experience. First, we have a detailed discussion about the suitable testing strategy for our product, and finally we choose bottom-up testing. Then during the testing procedure, we evaluated the relationship of every class, which again reflected the importance of class diagram design. We use testing techniques taught in lectures to achieve 100% coverage. However, there may still be some bugs in our product, since we did use exhausting testing which is not feasible in practical project development. Therefore, during the final edge, our team members worked as real users to imitate the acceptance test and found bugs under some edge cases. It is a really helpful experience to write bug reports, debugging, testing and producing the new releases.

Our team performed pretty well in project management. We have a detailed project plan, reasonable personnel allocation and everyone's strictly complying to the deadline in every phase. This project taught me a lot and I believe that I can be more competitive in real project development.

3 WANG Zhixuan

We have benefited a lot from this group work cooperation. Not only let us practice and enjoy the process of making a complete software program by ourselves, but also notice that integrating various resources and organizing team members' common division of labor is one of the important ways of learning.

As a member of the UI team in this project, I have mainly focused on UI design, programming and testing with my group members. It was difficult to divide work since the layout is prone to conflict when multiplayer editing. Therefore, we first confirmed the whole prototype of the entire design and then assigned different people with part of the container to program. This really gives a good workflow. We have had close communication whenever we encounter problems. During the development, as for my own effort, the UI development tool: Swing, is a completely novel development experience. I learnt the basic usage, properties, and method from the beginning and tried to meet the requirements of our prototype. This really enhances my professional skills.

For the whole team, we had meetings every week to confirm the progress of the two groups and make adjustments and optimization. Every week, we had a specific topic to discuss, especially the difficulties we have met. Just referring to the project plan we arranged at the beginning of the whole project, we design the management and frame constructor, choose the criteria and algorithm, and do the debugging and refactoring. And with the deepening of our learning content in the CS3343 course, more tools are applied to improve our cooperation level and optimize our code. It is obvious that putting new knowledge into practice while learning is indeed a good way to consolidate.

As for the testing process, we test every unit and then integrate them. Each member of the team is equivalent to a customer who uses our application, to conduct all possible operational tests. In the later stage of the project, we tried to stand on the user's point of view and continuously improve the program in order to enhance the user experience.

Although there are still some minor flaws in the UI design which we are responsible for, because of the unfamiliarity with Swing, this group cooperation still brings me a good experience. It includes project management, java programming and testing which simulates the actual program development process. Overall, this cooperation gives me a more comprehensive understanding of our future work.

4 XU Jiakai

In this project, as the general manager in the early stage, I was mainly responsible for the convening of group meetings, the establishment, and construction of the team collaboration platform, the scheduling of the overall timeline, as well as the follow-up and adjustment of the project schedule. In terms of specific software development, I was responsible for the software design and underlying architecture of the second back-end section, namely the triad of "criteria - algorithm - data list".

Such a combined work mode of management and technical posts benefits me greatly.

I remember reading "Peopleware: Productive Projects and Teams" in the last year. Project management is actually the management of people, and there is an old Chinese saying that "All things are difficult before they are easy". As the manager of the early-stage project, I am truly convinced about that. I clearly remember when I started building code collaboration platform, everyone had different ideas on the project file structures, some people think that opening the multilayer folder is a tedious thing, some members' notebooks cannot correctly identify the git file, also some people want to put the text type contents in different platforms. As a manager, the first thing I need to do is communicate and listen. Only after we understand the most fundamental concerns of everyone can I make a judgment from the overall situation. After that, I enumerate the advantages and disadvantages of different schemes to gain everyone's understanding and support. Ultimately, our project file structure was accepted and used efficiently by all; The branch merger process, which requires prior review by others, has proven to be an effective way to avoid errors and schedule disruptions. Understand each other in communication and strive to be efficient in cooperation. This project management experience improves my management ability and communication skills.

I also gained a lot from this project in terms of technology. This project gave me an unparalleled hands-on experience with software design patterns and object-oriented principles. In last semester's project, I was responsible for the design pattern section, but I was always thinking about putting what I designed on paper into practice. Actual software development in code is not the same as drawing class diagrams on paper. Sometimes seemingly simple associations need to pass more parameters to each other, and sometimes the interface design needs to be changed for the sake of other modules... Working on projects like this gave me an incomparable opportunity to appreciate the beauty of software design.

In the end, I would also like to express my greatest gratitude to all my team members once again. Thanks to everyone's unity, our project was successfully completed. Your intelligence and eagerness to learn enabled our software to realize all the original imaginations of functions! Thank you so much!

5 XU Rui

It was a great experience to take CS3343. This is an interesting class about how to process software engineering. I think in real work, the development of a project may follow such a process, which needs the cooperation of all departments, and achieve the goal according to the plan, and finally develop an excellent software within the cost requirements, easy maintenance, comprehensive functions and user satisfaction.

I worked on this project as PM. Although it seems that I am in charge, in fact, it is the efforts of all of the team members that contributed to the final completion of the project. At the early stage we had given thoughtful consideration on the assignment of work. Everyone did his/her job well, and the team members communicated and helped each other, so that we could finish our work within the corresponding time limit. It's also a good model for what we might encounter in our future job.

The premise of doing all the work well is to lay the foundation of the project. I mainly do this work in the project. I fully considered the user requirements, functional needs and future development and maintenance costs. I planned the general outline of the whole project before development, reserved interfaces, searched for data information from formal sources and methods to process them. All of these actions have provided correct guidance for the steady advancement of future projects and helped me develop an overall view for developing projects.

Also, it's important to use tools that make it easy to develop and communicate with team members. Different from other groups that may use Eclipse as a development platform, we mainly use IDEA for development, and use Fork, a convenient version control tool, which can control and manage the project development process well, and also helped us develop development specifications. We also think that the market for these softwares is brighter in the future, so using these softwares will also broaden our horizons.

We also encounter difficulties. For me, the biggest difficulty is how to properly and scientifically plan the work schedule, because it is very difficult to predict, and if delayed, it will have a negative impact on the whole project. So, I have to think about it very carefully.

For the group, it was the first time to use Java for UI development, so it did not achieve a good effect. I hope that if there is no restriction of using Java language in the future, we can do better.

That is my personal reflection.

6 ZHANG Xun

In this project, I worked with the UI team to design the user interface and programming with Swing library. From this project, I have gained much experience in UI design and programming, and version control.

UI design is an area I was not familiar with in the beginning. To design a good main interface for our user, I studied UI design principles by myself, and applied them on the project. One example is Fitts's law. I designed the buttons to let them be closer to each other, which can reduce the time for the user to click one button. After this process, I learned that self-learning is very important in project work, and a positive learning attitude can help a lot.

While designing the main interface, I also come across a problem – cross-system programming. The first experimental interface looks good on my MacBook, but is very different and badly organized on Windows PCs. At last, I managed to unite the interface in different systems by setting a uniform look and feel across the whole program. This experience has reminded me that when working with products that will be distributed to different users, we must care about other computers and OSes. Only working on my own computer is far from enough for a software product.

In my programming with Swing library, I have gained a deeper understanding about object-oriented programming with Java. Since Swing takes lots of objects as buttons, texts, frames, etc., inherit is always used. Understanding and applying OO principles is important. Also, since Swing is new to all of our group members, this has also challenged our self-learning skills.

Also, we have gained experience in version control with Git and GitHub. This is an area where we take full advantage of, but still has room for improvement. Before learning Git, my projects in other courses do not have version control, and relies on chat software to send codes to each other, this is not efficient and somewhat risky. But in this project of CS3343, we make a huge leap forward by simply relying on Git and GitHub to manage all of our codes and changes. The prior Git knowledge acquired from placement work helps me a lot. I manage my own Git branch very well, and use pull requests when necessary. This makes our project easy to manage, and reduces errors when merging codes. Still, there is room for improvement, since we are new to pull requests in GitHub. But from experiences in this project, we can use pull requests to merge codes better, and avoid overwriting in the future.

Last but not least, I have learned the importance of communication in projects. We hold meetings very often to discuss development details and processes. Both online and offline meetings ensure our project can progress continuously and stay on the right track. All of the experiences acquired from this course project will benefit me a lot in the future.