**G52GRP Individual Report**

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| Project title | A decision-making system for engineers to synthesize a wastewater treatment plant |
| Date | 13/03/2022 |
| Group ID | 2A |
| Name | Tan Zhun Xian |
| Username | hcyzt1 |
| Other Group Members | * Lee Pei Yi * Lim Zi Qin * Ng Kar Yan * Liew Zi Xian * Kaori Choi Wai Teng * Khoa Vu Nguyen Anh |
| Supervisor | Mr KR Selvaraj |

**Summary of own individual contribution to the project**

* Initial Code
  + My main contribution to the project is the code to the project. It was made using Java in Intellij. It was text-based and lacked any GUI and was overall not visually appealing. However, that was not its purpose as it was meant to be a proof of concept. It was received quite warmly by the other group members and its influence can still be seen in the later versions of the software.
* Reworked Code
  + After attending the Software Maintenance module, I decided to rework the entire code to improve maintainability as taught in the module. Additional features were also added into the new code as the requirements of the project were slowly being made clear by the client.
* Maintenance
  + As the other group members worked on implementing the GUI, I was tasked to fix any bugs that appeared during the integration of the code and GUI.

**Reflection on the project, the running of it, and own role within it, including honest and insightful self-assessment**

* Module Briefing
  + After the end of the holidays preceding the second year, I returned to another semester of online classes. Looking through my new modules, I was quite intrigued by the Software Engineering Group Project (SEGP) module. It was the module with the longest and most informative page in Moodle. So, I eagerly awaited the module briefing for the subject. As I listened to the briefing, I realised that the module was designed to mimic actual software development in the real world to better prepare us for our jobs. It was explained to us that in a professional environment, we are likely not able to choose our team members or our projects. So, to emulate this aspect of the job, our group members and projects were chosen randomly by the lecturer. I was quite nervous at this point as this method of group allocation was out of the norm as before this we were able to form our own groups with our friends. However, I saw merit in this situation as it will give me valuable experience in working with strangers. And better prepare me for work in the real world.
* Meeting the new members
  + After the module briefing, we were instructed to meet our new group members to socialise and break the ice. After some short messages in WhatsApp, our group successfully created a new group in Microsoft Teams. When we all joined the meeting, everyone was silent as we all were strangers to each other and had no topic to start any conversations. After 5 minutes of silence, someone finally decided to talk. Liew Zi Xian unmuted his microphone and introduced himself. Thus, we were all given a shot of courage by his action and we then introduced ourselves one after the other. Then, we started to make some small talk to break the ice.
* Electing the leader
  + However, our task for the day was not done yet. For a group to prosper, we require a good leader. This point was brought up towards the end of the meeting by Liew Zi Xian. However, since we did not know any of our capabilities at this point, we thus unanimously elected Liew as our group leader since he was the one to ask. Although a bit reluctant, Liew accepted the responsibility in the end with the promise that he would abdicate his position if another person was better qualified for the job. However, I can confidently say that Liew was a phenomenal leader and led our group quite well in this project.
* Meeting the Client
  + After meeting as a group and electing the leader, our next step in the project was to meet the client to ascertain the requirements for the project. The client for our project is a female PhD student in Nottingham and we discussed the project with her in a short meeting. At the end of the meeting, we had a rough idea on how the software should look like. The client also promised to send us documents related to the project to help us in creating the software.
* Initial Code
  + After the meeting with the client, I was quite bored. This was due to the fact that it was the start of the semester and thus our workload was still quite light. Having a lot of free time on my hands, I decided to try creating the initial code for the software. With my limited Java skills from last semester, I managed to cobble together a prototype for the software in a few short days. The prototype was text-based and has no GUI so it was not visually appealing. Users also had to enter numbers using the keyboard to select choices so it was quite bothersome. However, it performed adequately as a proof of concept for the software. Its influence can still be seen and felt in the later versions of the software.
* Assigning Work
  + After finishing the prototype, I immediately presented it to my group members. They were quite shocked to say the least. This was because other groups were more focused on finalising the project requirements and writing the project report. However, they were quite pleased with this development as this meant that we were ahead in the game and could breathe a little more easily. Then, we decided to assign work to each of our members. I was put in charge of the backend code with 2 helpers while the others took care of the GUI and the database.
* Report Writing
  + However, we still needed to write a report on the project to be submitted at the end of the semester. We took inspiration from the reports of previous students provided to us in Moodle and we scoured the internet for any useful references to include in the report. Needless to say, we credited everyone whose work we used in our report as plagiarism is a serious offence. It was a team effort and our team bonded and grew closer as we worked together on the report. However, we were too overzealous in our endeavour. In our haste to complete the report, we neglected to read the student handbook provided to us in Moodle. This was quite an oversight as the student handbook specifically specified a word limit on the report. By that point, our report had surpassed the word limit by a few thousand words. Luckily, our leader, Liew decided to peruse the student handbook to look for any help with the report a few days before the deadline. He was made aware of the word limit and quickly notified the group. As expected, we were quite panicked and quickly reworked the report. We deleted a lot of less useful content and paraphrased the more useful ones to shorten the report. In the end, we managed to get the report within the word limit and we quickly submitted it. According to our calculations, if we had submitted the original report with the old word count, we would have gotten 0 marks on the report due to the word limit penalties. So, we were quite relieved to have noticed the issue before we were penalised. In the end, our report received an average mark so we were not too happy but not too disappointed either.
* Peer Assessment
  + After the report, we were required to submit a peer assessment. To be honest, I was quite confused since the peer assessment was done quite early in the project. I believe that all the groups had not gotten into any of the serious work and thus the peer assessment would be quite inaccurate in measuring our contributions. However, I decided to just abide by the decision of the university. I gave the other group members fair marks as we genuinely worked hard on the report together as a team as that was our only major work. I then hoped that the other group members did the same for me and gave me fair marks too.
* Hiatus
  + After the end of the first semester of the second year, our group stopped any and all work on the project. This was because of the holidays, specifically Chinese New Years which was celebrated by everyone in our group. So, no work was done during this time period.
* Reworked Code
  + After the holidays, the second semester of the school year started. At that point, I had completed my Software Maintenance module and had learned some valuable concepts such as code maintainability. So, I decided to look at the code with my more experienced eyes. What I saw in my code shocked me to the core. From a maintainability standpoint, my code was horrendous and would definitely fail industrial standards. So, I decided to rework my code to adhere to the principles of maintainability. It took a few days of hard work to restructure the code. I also decided to add a simple AI search method to the software. The search method in question is the uniform cost search and is used to find the best combination of technologies in the wastewater management system. The addition of this AI search method was to satisfy the requirement of the project to incorporate AI into our software. In the end, what I managed to create was enough to satisfy me. I showed my new and improved code to my group members and they were also impressed with it. Thus, we decided to use this new code as the base of our software.
* GUI
  + A good software requires a good GUI. Thus, our group also started in the development of a GUI for the software. Our leader, Liew gave us the initial design of the GUI, featuring motifs of water droplets and heavily featuring the colour blue to better represent our project as a wastewater management software. The GUI has seen a lot of improvements over the weeks of development and looks quite visually appealing. This point was further corroborated by our client who praised the looks and aesthetics of the software when she saw it during our monthly meeting. We had also managed to incorporate sound effects into the software to give it a livelier feeling. Needless to say, our group has high hopes for our software.
* Database Issues
  + However, our journey in developing the software was not without its issues. We have a longstanding issue with linking out software to a remote database. The database in question was Jupiter provided by Nottingham itself. Never the less, through the perseverance of our groupmates and the generous help of internet resources, we managed to successfully link our software with a working database.
* Self-Assessment
  + In the end, I believe I did my fair share of work on the project. However, sometimes I wish there was more work allocated to me. This is due to the fact that there are sometimes short periods of a few days where I could not add anything meaningful to the software as my other groupmates were busy adding the GUI. This has caused me to feel bored and anxious as I feel as though I am not contributing enough to the project even with assurances that I did from the other members of the group.
  + I also wish that I could have started the project with a better grasp of Java as I could have created a better prototype earlier and thus, we would have more time to improve on the software. If I was better at programming then perhaps, I could have also used a more advanced AI search method in the program and thus made our software stand out more.

**Peer assessment**