G52GRP Individual Report

Project Title:

Shopping Cart Application for Movement Detection of Old-folks and Disabled People

Date: 01/05/2020

Group Information: Group 9A

Prepared by: Sea Wei Chuen (hcyws1)

Other group members:

Name	OWA	Student ID
Chloe San Hue Tung	hcycs1	20118169
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Supervisor: Dr Neoh Siew Chin

Summary of project:

We have developed a mobile application that receives data from some of the device's sensors and processes it into user movements. The data is then uploaded to an online server and sent to the trolley. The trolley then moves in parallel with the users' movements, effectively following the user as they go about their usual shopping. The project goal is to aid the elderly and disabled during grocery shopping by relieving the burden of pushing a shopping cart when shopping.

Summary of individual contribution:

Official roles played:

Throughout the duration of this full year module all the group members have been assigned a role that they will have to play throughout the whole project. But we have agreed that these roles assigned to us will not be a means to "throw work" to the person in charge. But instead, the tasks can be distributed based on the availability of the group members. So, on top of our assigned roles we often help one another. I have been playing the role of lead programmer and repository master since the beginning of the module. I have also created the github repository and managed the repository throughout the project.

Obtaining sensor data from mobile device:

Our first milestone was decided after receiving the topic of the project and meeting with our client Miss Yana from UCSI university. So, in order to achieve this milestone, I have conducted research with group members to learn more about how to obtain sensor data from mobile phones.

After we have done sufficient research, we were split into teams. 1 team was responsible for frontend coding while the other for backend coding. These teams are responsible for their assigned tasks while still performing each of their individual roles mentioned above. I have ensured that both teams work on 2 separate github repositories in order to prevent any conflicts, this is due to the backend team needing to use the app page for graphing purposes. I have also encouraged the use of feature branches when implementing new features to ensure the master branch is always working. Finally, I have also resolved merge conflicts throughout the project.

I was in the backend team and had to display sensor data onto the phone screen as our first task. Therefore, we had informal group meetings with the backend team to work on this task together. After this was complete, we worked on adding more sensors to be displayed on screen. Finally, we were able to get the app to plot the gyroscope, accelerometer and sensor data onto a graph and display it on the app screen in real time.

Implementation of data logging to obtain walking data:

In order to obtain the walking data, we had to implement a way to log the data. We have added start and stop buttons below the plotted graph. These buttons start recording the plotted data into an excel sheet as well as saves the file when stopped. I was responsible for making sure the buttons work properly and the excel sheets are saved correctly according to date and time.

After data logging was implemented, it was decided that my walking data is to be used for analysis. Thus, I recorded myself walking in various ways. I have recorded myself walking fast, walking slowly, walking fast and turning as well as walking slow and turning. I have made sure to record the same type of walking several times so more reliable walking data can be obtained.

Interim report:

Next, we decided to focus our efforts on the interim report. We have assigned every group member a section of the interim report to complete. I was tasked with 4 of the 15 sections, which includes the requirement specifications, drawing of use case diagrams and low fidelity prototypes, software testing and writing the discussions section. This marks the end of the first semester.

Merging backend code and frontend code:

As the backend team have completed the implementation of the core functionalities of the app and the frontend team has designed the frontend already. I have done the merging of backend code with the frontend code into a single android studio project. I have achieved this by carefully removing the graphing part of the backend code as it is not needed by the actual app. With this, I have successfully merged the backend code with the front end.

Implementing app functionalities:

The gui contains arrows which are supposed to blink according to the user movement detected. I have coded the logic of which arrow should blink when a specific user movement is detected. This is done so that the user receives some feedback as to what data is detected by the app algorithm. Furthermore, a stable internet connection is needed for our app to connect to the server. Therefore, I have added a piece of code that detects if the phone is connected to the internet and displays a warning message in the app screen when the phone is not connected to the internet.

Online presentation and software demo:

Before the poster submission was cancelled, I had created an A4 poster for the open day using photo editing apps. For the online presentation, I assisted in the writing of slides. As for the software demo, I was responsible for showcasing the software. This includes recording a video of the app screen and a video of me using the app to show that the user movement data matches the data detected by the app. After recording the videos, I edited the videos together in a simple to understand manner with several screens playing at the same time so the examiners can see the app in action.

Reflections on the project:

Throughout the entire duration of the project development of the Shopping Cart Application for Movement Detection of Old-folks and Disabled People, I believe we have certainly made many decisions which have affected the quality of the end product and even the total development time. Although I believe that all of these decisions were made by the group members objectively, with a common goal of bringing out the full potential of this project. Due to the lack of experience, we have certainly made some mistakes throughout project development. Therefore, having experienced the full module there are certain aspects that I would like to change. Below are my critical thoughts on the entire project development.

Running of the project:

This project was run mostly using agile scrum framework, where the product owner would be our client Ms Yana. The scrum master would be our group leader and the rest of the group would be the development team. The scrum master would manage the product backlog using Trello, to keep track of all the required tasks. We have done our work in sprints which consists of several tasks to complete a bigger goal. Every week, we will have our weekly stand up during our weekly meetings so everybody knows what has been completed and what is left to be done. We also have supervision meetings with our supervisor when needed, so we can have guidance and feedback from our supervisor. Finally, we have the scrum review which is the online software demo and presentation.

Overall, the scrum framework is an excellent framework for getting work done consistently, and efficiently. But I also believe that what really makes scrum framework so effective is the peer pressure it asserts onto everyone involved. For example, it is the fear of not having done your work while all your groupmates have done theirs which makes the scrum framework effective. This might be a good way to motivate group members under normal circumstances, but under high stress situations such as a deadly pandemic where a movement control order is imposed. This peer pressure might have a negative effect instead. Moreover, it might even endanger the mental health of the parties involved. During the pandemic, our group had 2 groupmates who were essential "stranded" on campus. Upon reflection, if I had a chance to restart the sprint I would've taken a more active role in checking up on everyone's mental health and possibly take up some of their work load if needed.

Next, although we have used the scrum process framework throughout the whole project, we did not conduct the scrum retrospective at the end of each sprint. It is during this retrospective session where the development team have a brainstorm session of what went wrong throughout the sprint and what can be improved during the next sprint. if I was able to start this project over again, I would like to have a scrum retrospective at the end of a sprint. I believe that one of the reason it was not conducted is because we underestimated the importance of a retrospective session. Another reason is that at the end of the previous sprint, we were busy preparing for exams.

Unofficial roles played:

Besides my personal contributions stated above, I have made it a point to be more vocal during meeting sessions. I have done this because group meetings at the start of the project were pretty silent and I truly believe that anyone would work better if they have some sort of feedback on their work instead. They would feel more motivated when their work has been praised likewise if their work requires modification, it would be easier to carry out if some guidance was given to them. I also believe that by being vocal it will be easier for others to voice out their ideas and feedback about my work or decisions as well, making the weekly meetings more productive overall. For example, when someone shares their progress I would praise them for their work and when there is an issue that is faced by a group member I would give my opinion on the best solution to solve the problem.

Furthermore, as the group members for this project have been chosen at random, most of us did not know each other from the beginning. Therefore, I have also been acting as a bridge between the members as I have a good relationship with all of the members. This is especially important because 4 of us are local students while there is an international student. It is very easy to feel awkward and excluded as the only international student. I also believe that, it might be easier for misunderstandings and disagreements to occur due to cultural differences. Therefore, I have made effort to get everyone familiar with each other by spending some time together during non-meeting hours like eating lunch together or doing work together in common study areas.

Reflecting at all my efforts to improve the team dynamic back then, I feel that it was a good thing that I acted the way I did. Because at the beginning, the group meetings were pretty silent and not much feedback was given to each other regardless the quality of work presented. There was also an awkward air when we were together. But eventually as time passed, it slowly started to change with the members being more expressive during meetings and being more friendly with each other. I feel that since then, our team dynamics have significantly improved and tasks could be done more efficiently than before. I would like to acknowledge that this improvement in team atmosphere was not only my efforts alone but it was because everybody truly put in effort into making this project the best it can be. However, through my efforts to improve the team dynamic. I may have come across as overbearing towards the more introverted group members, which may have caused them to feel uncomfortable. Upon reflection, if I could restart the sprint I would have been more observant towards my groupmate's body language so I do not cause any discomfort to any of my groupmates. I also regretted not suggesting to have a celebratory lunch or dinner at the end of each scrum sprint. I feel that celebrating together would allow groupmates to relax and get to know each other better in an informal setting. Hopefully removing any possible negative feelings towards one

another due to the stress of having to complete tasks weekly. I did not suggest it due to negligence on my part which I will correct in the future.

Skills learned:

Through this module, it has taught me to manage my time better in order to complete the weekly tasks. The motivation behind why I was able to learn this was because of peer pressure. It is not fair to let my groupmates down when they have done their part. Other than that, having a client's requirements to satisfy has really brought me out of my comfort zone. It has exposed me to interacting with the client for milestone updates as well as expectation handling. This has enabled me to have good work ethics as well as taught me how to interact with a client in a professional manner. For example, when the client asks me a question, I would have to think of an answer on the top of my head and convey it in a concise manner. Next, I have learned how to work in a team of programmers more efficiently. I have learned this through the proper use of tools like github, slack and trello. Finally, the most important skill I have learned is people management. I have come to understand that it is very important to try to read the body language of groupmates. For example, there were several instances where I have come across as overbearing to group members during discussion and this has affected my relationship with that groupmate negatively temporarily. If I could start over, I would pay more attention to the body language of my peers to avoid potential misunderstandings.

Conclusion:

In conclusion, after 2 academic semesters we have managed to deliver a product which fully satisfies the clients requirements (as shown in the testimony attached in the appendix). Although initially, we wanted to use machine learning to analyse the user movement to increase the accuracy of the app. We did not proceed with it as this approach proved to be too complex for us. We believed that we did not possess sufficient knowledge on the topic at the time. Overall, I think that this has been a valuable learning experience for me, and I believe that the lessons I've learned will be extremely beneficial for my personal and my career development

Appendix:

[1] <u>**Testimony from Client**</u>

To begin with, I would like to thank to Asst. Prof. Dr. Neoh Siew Chin, who has given me an opportunity to share the thought on creating the smart shopping trolley for old folks. Moreover, I would like to thank the young software developer group from Nottingham University; Chloe, Hong Leong, Wei Chuen, Kevin and Essam for their effort to form Troll-E. They have shown a great exertion in investigating new things that is a bit out of their field and continuously show an outstanding progress throughout this project timeline. Hopefully we could collaborate again in the future.

Miss Yana

[2] G52GRP Peer Assessment Form

Complete one copy of this form for each member of your G52GRP group except yourself. Enclose all completed form as an appendix with your Individual Report. Rate the group member in question by ticking or marking with an "x" *exactly one* box for each evaluation aspect in the table below. Give a brief written justification for each assigned rating in the space provided below the table. For further information, see the Peer Assessment section of the G52GRP Student Handbook.

Name of assessed group member: Chloe San Hue Tung

	None	Lacking	Adequate	Good	Excellent
Research & information gathering				x	
Creative input				x	
Co-operation within group					x
Communication within group				x	
Concrete contribution[1]					x
Attendance at meetings					x

Justification of assigned marks: Chloe has been a good group leader throughout the whole project and has contributed a lot to the development of the project.

Name of assessed group member: Issam Ibrahim Alkomey

	None	Lacking	Adequate	Good	Excellent
Research & information gathering				x	
Creative input				x	
Co-operation within group					x
Communication within group				x	
Concrete contribution[2]			X		
Attendance at meetings				x	

Justification of assigned marks: Issam is a cooperative member throughout the project. But some of meetings have been missed due to other on campus responsibilities. The quality of work is also adequate at best.

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[1]Quality and quantity of concrete contribution to *group deliverables*: writing, coding, testing, open day display, preparations for presentations, etc.

Name of assessed group member: Kevin Chee Shao Yang

	None	Lacking	Adequate	Good	Excellent
Research & information gathering				x	
Creative input				x	
Co-operation within group					x
Communication within group				x	
Concrete contribution[3]					x
Attendance at meetings					x

Justification of assigned marks: Kevin has been a competent secretary throughout the project. Although he is a bit quiet and introverted. This has not stopped him from communicating well with the group and performing his duties.

Name of assessed group member: Lim Hong Leong

	None	Lacking	Adequate	Good	Excellent
Research & information gathering				x	
Creative input				x	
Co-operation within group					x
Communication within group				x	
Concrete contribution[4]					x
Attendance at meetings					x

Justification of assigned marks: Hong Leong is a group member that has given a lot of input although not creative during meetings and has done all the tasks that have been assigned to him well and efficiently.