

Assignment 3: Our IT Project

KHAI NGO

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Team profile

Khai Ngo



Personal information

My fields of interest in IT are data analysis and AI. My interest in IT start when I was around 10 years old, my dad used to manage a outsource company in Vietnam, and my interest start when I interact with his employees. Moreover, I always like to play video game when I was little and wanted to create a game when I grow up. I have 5-6 years of IT experiences.

Interest in IT

- Artificial Intelligent
- Mixed reality
- Data Science
- Game development

Team Profile

Across our team, one common trait is introversion, so our team gets along with each other pretty well. Moreover, most of the team members have already known each other, so that trait would not be a disadvantage. However, one of the drawbacks of not having any extrovert member is that our project pitch presentation would be harder to do. We also have a moderately balanced team between logic and feeling. Furthermore, since I am one of the two mediators in the team, I would be able to communicate more effectively between each member and manage the workflow better.

Group Process

For assignment 3, I think the group have work more effectively than assignment. This might be we are used to each other and all the app we are using to collab. Moreover, this time we have decided to split the group up into two smaller to tackle the presentation slides and A3 at the same time.

Career Plan

Among everyone ideal job and career plan, mine career (product manager) is probably take the longest to achieve. Because in order to become one, I have to learn a lot, not just from IT, but from business side too. However, I still have something in common with everyone career plan is that I would still need to be a developer before I could achieve my goal. Ideally, I have to gain a least 6 years of experience working in this field before I could become one. Furthermore, I would also need to learn more about the business aspect of IT.

Ngan Phan



Personal information

My fields of interest in IT are data analysis and AI. My interest in IT start when I was around 10 years old, my dad used to manage a outsource company in Vietnam, and my interest start when I interact with his employees. Moreover, I always like to play video game when I was little and wanted to create a game when I grow up. I have 5-6 years of IT experiences.

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Group Process

My team is doing quite well, we share the work equally and we have supported each other in the process. Although, there are some members that are quite lazy, but other members push them to try to complete. During the working process, we realized that each member has different strengths and weaknesses so we also quickly changed jobs because being able to do what they like will help quickly get the job done. success and achieve high efficiency. in addition, when it changed, it was almost easy for everyone to complete their work, which helped to complete task 2. Nothing has changed much in quest 3, because we know each other's abilities so we can do it better and faster. In addition, the members had many meetings together to exchange ideas which made it easier for members to support each other.

Career Plan

I am intrigued by the software architect job which combined a lot of soft skills such as leadership skills, teamwork skills and communication skills. My job needs conditions quite similar with the jobs of Khai and Dung are we all work with team, have many years' experience about software development and know programming in several languages such as HTML, Java and Linux. My team has the common points of needing to have a long experience and know a variety of programming languages. I think my job will lose over 10 years to achieve this job and my job will be harder to achieve than my friends' job because it requires worker have to have a high experience in software development and software system architecture. In the assignment 2, I think my plan is different with my friends because they write clearly the goals of the month and the year and they give themselves the work they need to do, I also changed my plan, I want to see my clear goals for achieving this job and to pursue this job, I have ro persevere and make more effort. I need to come up with a list of each month each year what I need to achieve and what I have not achieved will take long. I do when I do so it will help motivate me and know the path I am taking.

Dung Nguyen



Personal information

I come from Dong Nai province and I have learnt at Ho Chi Minh city for nearly 8 years. In my spare time, I like to play video games with my friends or watching movies. Moreover, I have started to learn cooking due to the covid-19 make people stay at home. 4

Interest in IT

Since the day I am using computer for the first time, I have wanted to learn about it so much that I decided to become an engineer in science and technology. In addition, learning about computer also help me to understand how modern computer working and develop it more to become most optimized day by day.

Team Profile

The result show that I am a logical and adaptable person so I think I can work well with my partners. According to my other partners, they mostly are introvert person so there will be difficult to working in a large group. However, I think they are both the good listener so we may go on well.

Group Process

I expect that our group have a better work on this Assignment 3. After Assignment 2, we have understood more about each other capacity so that we can divide works properly. In addition, the progress' results are very well and we are both happy about that.

Career Plan

My group has four members: Khai, Ngan, Minh Anh and Hoang Dung. Khai is the leader and he want to become a product manager of game. In addition, my ideal job is data engineer and it is the same with Minh Anh are quite the same in some parts. However, Khai is mostly focus on building game plants and ideas. The last group member is Ngan and she want to work as a

software engineer which is very difficult and take a very long time to become a real expert. The amount time Minh Anh, Khai and me have to spend are not as long as she has to. Beside many difficulties, our members are motivated, and they draw an aim follow so I hope they will achieve their success soon.

Anh Minh



Personal information

My name is Minh Anh and people often call me MA and I come from Vietnam. My ID is S3863946 and my email address is s3863946@rmit.edu.vn. My hobbies during free days are hanging out with my family and having meaningful weekend activities with my family. I don't have too much time with my family, so I usually stay home on weekends or go with my family. The main reason I love IT is because I want to know in detail about the stuff, I use every day, how it is organized and how it works. When I was little, I found a lot of fascinating things about computers when I first came across computers and I had a dream that I would do computer related work when I was growing up.

Interest in IT

- Game development
- Mobile App Development (Android, React Native, iOS)
- Architectural software: Design and performance

Team Profile

This outcome shows my temperament is Protector and I appear to be introverted, observant, working on emotions and judgement. I am a sensual person but before I do or say something, I don't think about anything. I'm still an introvert who never interacts with others but I'm an analyst who can help my team do the job effectively as a defender. This outcome shows that I'm a guy who performs all without looking at it and it makes me do well as I look at other facets of it. This outcome shows that for many issues, I'm a pretty complex individual and my

complexity is really small. I think 53.2 percent of innovation is always a good amount and I think I'm an innovative person as well.

Group Process

Regarding the group processes, assignment 2 had been done as our group expected the turnout result. Our group divided parts evenly for each individual and combined to finalize the final draft. All of the members contributed to finish the group project without any complaint or delay. The result has turned out the same for Assignment 3 as we already worked with each other before, which makes it easier to discuss and to work as a group.

Career Plan

I still want to pursue a career that I completed in the past because I find it very interesting to me until now. Through assignment 1,2, it helped me think more carefully and should prepare what I need for my job. It is very different in different positions because I see each position has its own difficulty and importance. I hope in the future I will do the best in the positions that I have been assigned and that everyone has trusted

Tools

GitHub repo: <https://github.com/s3836387/Assignment/A3>

Our web: <https://s3836387.github.io/Assignment/A3/index.html>

Project description

Overview

Topic

VR/AR technology is on the rise, and along with it is the gaming experience. Moreover, with the current pandemic, we could see the high demand for this kind of technology. Some of the reasons why this kind of technology is in need are to enhance the experience of interacting and communicating with other people digitally; to escape reality for relaxation or immerse yourself in another world. And since our team is composed of gamers, we have decided on our project idea to be a VR suit (or haptic suit).

Our project originally has to main parts, body motion detection and sensor feedback system, but due to limited time and resources, we will only do the first part. The suit will be able to capture the user motion more accurately and let the user move more freely than what the current VR system offer. It is composed of two main components, upper-body and lower-body,

both can work independently with each other. Because of that, the suit has many other usages outside of gaming, like for animation motion capture, medical training, combat training etc. Therefore, our main focus on this project is to capture the body motion as accurate as possible.

Motivation

Our central motivation for this project is for gaming usage. However, this technology could be used in many ways. For example, medical rehabilitation, the suit pulse could provide valuable feedback for restoring the movements of a patient. Furthermore, the doctor could also collect data from the suit to provide better treatment for the patient.

Landscape

The VR/AR technology have been on the rise in recent years. The market is dominated by two big company that produce VR related system exclusively, HTC Vive and Oculus (brand of Facebook Technologies). The VR system produce by those two company use a similar technology, which have a headset, two controller and four sensors that the user will set up around the environment. In addition to that, there are two company that produce a similar product to ours, that is Bhaptics and Teslasuit. There are not too many differences between our project and the product they are making, but we are planning to make it more affordable, people can mod it and make it open source. Moreover, if possible, we would also want to discover if there is a more efficient and accurate way to track user motion.

Detailed Description

Aims

Our aim for this project is to finish phase 1 (or parts of it), which is the full-body motion detection function. Currently, most VR technology only allows the user to use their upper body (hands and head). Because of that, our main goal is to develop a suit that allows the user to move freely in the virtual world while wearing it (upper-body and lower-body). And to achieve this goal, we would have to divide our project into sub goals.

Goal 1: First and foremost, we will need to decide what kind of motion detection method we want to use. The reason this goal is significant to the project is everything we are going to develop will be based on which path we took. There are several types of method that big companies are using, like VR tracking with Optic, placing sensors around the user environment, and use trackers to track user motion (like Vive Cosmos and Oculus Rift); or Non-optical VR tracking, use electromechanical sensors such as gyroscopes to track motion (the PS4 controller) or Myo armband which tracks electrical impulse from the muscles.

Goal 2: After we have decided which method, we want to base our project on, we will start to develop the arm and upper body motion detection. Whichever method we choose to use, our aim in this goal is to use that motion detection method and detect our arm motion. And since arm motion detection is the most basic function in all the methods, it will be beneficial for us to achieve this goal early on. Moreover, it would also help us to familiarize ourselves with the technology we choose.

Goal 3: Our third goal is to develop the lower body component of the suit and connect it with the upper body component. The reason this goal seems longer than the previous goals is the extra step of connecting to the upper body component. Moreover, this task could be a bit challenging since we have to make sure that the lower component works smoothly (no misinterpretation, no conflict) with the upper component. Furthermore, assuming we have already achieved the previous goals, the motion detection function of the lower body component will be just like the upper body component.

Goal 4: Our fourth goal is to develop the hand gesture detection function. Because of how many gestures our hand can produce, this would probably be one of the most challenging components. Furthermore, our hand is the most important tool on our body, so this function must run smoothly and accurately.

Goal 5: Our final goal is to make sure that everything will work smoothly with each other. Before we can move on to the next phase of our project, we want to make sure that the motion tracking function of the suit is working as intended. However, we are going to refine our motion tracking function to an extent as not everything will work perfectly, and we cannot work on it forever. Therefore, the goal is satisfied when there are not any major glitches.

The goals are organized by their priority in phase 1 of the project. If things do not go as expected, we will try and finish, at least, the second goal. Because of how fundamental and beneficial to finish the second goal is, it is our top priority. If we successfully achieve the second goal, we would also acquire the knowledge to do part of the third goal.

Plans and Progress

What is our project

Our project came into fruition after we watch the 2018 movie "Ready Player One" in which the main character wore the suit to play his game more immersive. Moreover, because all of our team members are gamer, we were super motivated and inspire by that concept. As the name suggested, our project lets you fully interact with the virtual environment while wearing the suit. What makes the suit special is that it can track your every movement more accurately than

the normal VR controller. Furthermore, ideally, if more time and resources are permitted, our suit would also have sensor feedback just like in the movie.

Description

A haptic suit is composed of components that lets the user experience the VR world more immersive. The suit would have some kind of motion sensors on it for tracking the user movements. Furthermore, the suit would also have a feedback mechanism that lets the user feel the virtual objects. One of the ways the sensors work is to detect the electrical activity of the user's muscle and link it to a specific motion. Or we could have different detection points on the suit and have the motion sensor surround the user like current Vive or Oculus technology. Moreover, the haptic suit would also be some kind of technology to generate the sensation of feeling on the user's skin. We do not think this technology existed yet, but we think we could assemble something related to it by using heat pads or a pain stimulator (turn down) to stimulate the pain. Or we could also use technology like the kinetic mirror , with many dots, to simulate the touch feeling. Another approach is we can make a layer of the suit to be inflatable to simulate pressure. Next, we would need a mini processor to process all the raw data from the suit and output it to a receiver. Moreover, the processor would also house some kind of AI to process all the movement and manage the suit function.

Progress

For the first three weeks, all group members worked together to brainstorm and develop the project idea. This will ensure that everyone will get a saying in the project and find out who is best leader for each phase of the project. Furthermore, since we do not have enough time, we will only be focused on one of the core functions of the project, which is the motion tracking function.

Moreover, because we want to keep track of the progress of the project, we will be using our goals as anchor points and project map. Moreover, using our goals as anchor points will also ensure our project stay on track and prevent any 'project creep'.

Plan

Week 1

- Objective: Project idea development
- Description: In this week we focused on developing our project idea. We will cover some key point like How we are going to develop it? Feasibility? Cost? Landscape? And divided the tasks among group member.
- Outcomes: We have decided on what our project is and start to divide our workload among the team member

Week 2

- Objective: Making the project plan, design prototype
- Description: In this week we will, as a group, make a somewhat detail plan for our project and assign job to each member. We will also try to make some early prototype by using other VR company product.
- Outcomes: We will have a project plan for the whole team to followed and an early prototype of the project to see if there are any problem that will arise.

Week 3

- Objective: Making a pitch presentation and test our prototype
- Description: In this week we will divide the group into two smaller group, one will make the slides for the presentation (pitch) and one group will test the prototype to refine it
- Outcomes: Have a pitch presentation slide and a working prototype with all the core function work.

Goal 1: Decide what kind of motion detection method we want to use.

Duration: 1-2 weeks Feasibility

For our first goal, we want to spend some amount of time to choose the appropriate technology and tracking method we will be using. This is, undoubtedly, the most important step in our project, since each technology will have a different implement method. The main problem we would have in this step is the availability of other VR technologies like the Myo armband or the Vive Tracker for us to test. Furthermore, to compare each technology equally, we would also have to make a test to measure the result. For example, this test could be about the motion tracking accuracy of each method or the response time of each technology. The technology we will choose to use would have to fulfill some requirements like strong code community and customizable

Goal 2: Develop arm and upper body motion detection

Duration: 3-5 weeks

For this step, for the first couple of weeks, we will be designing and making our prototype of the arm and the upper body motion detector. By this point, we would have already decided on which kind of technology we want to use and so we will build our prototype base on that. After we are satisfied with the prototype, we will begin to build our first version of the arm and the

upper body motion detector. Furthermore, before moving onto the next step, we would also have to ensure that the component work properly and only have some minor errors.

Goal 3: Develop lower body motion detection and connect it to upper body component

Duration: 3 - 5 weeks

For the first part of this step, just like the previous step, the first couple of weeks would also be for designing and making a prototype. However, we predict that it will be faster than the previous step since we only have to make remakes the technology a bit. After we are done with the prototype, we will also be making the first version of this component and test it for bugs and errors. We will be moving onto the next part after most major bugs have been fixed.

The second part of this step is to ensure that two components (upper and lower body) can work smoothly with each other. For this part we have two potential methods that could work: connect both parts to a microprocessor or connect them directly into the computer. The latter could put a lot of loads on the user computer CPU.

Goal 4: Hand gesture detection

Duration: 2-3 weeks

For this step, we will develop a type of gloves that can detect which hand gestures you are making. Just like the previous step, the first week would also be for prototyping. There are some methods we are considered using: a glove with sensors on the joints of each finger or implement the technology use in the Myo armband. The first method is more straightforward than the second, but it could increase the processing time of the suit with all the added sensors (14 sensors/hand). The latter method will be a hybrid between two motion detection method, where we implement the Myo armband into our suit.

Goal 5: Refinement.

Duration: 1-2 weeks

In our final step, we will continue to test all the components to see how well it work together. We will design and conduct some tests on the suit accuracy and response time to further fine-tune it. The main goal for this step is to find and fix all the major bugs that might have arisen when we put all components together.

Roles

Product manager (Khai Ngo)

I am doing this role because this is my ideal job and I want to practice leading a team. My responsibility is to keep track of everyone progress and make sure every member knows what they are doing. Additionally, it is great opportunity for me to practice my communication skill as I have to communicate well with everyone in the team. Finally, I am also responsible for planning and distribute work for all member in the team.

Beside the Product manager role, all member will take turn being the leader for each phases of the project. The group will vote the leader of each phases by the knowledge they know about that step. Additionally, this system will ensure that everyone have a chance to experience leading a team. The two role that will change week by week is the **Lead Developer** and **Technical Designer**. Furthermore, the two main roles above would be also responsible for testing each component of the project since we do not have a dedicated tester.

Lead Developer: He/ She will be responsible for designing and lead the coding aspect of our project. He/ She will also design the structure of our software (which code patterns), divide the code to all the member, combine and finalize all the codes.

Technical/ Product designer: He/ She will be responsible for the overseeing the production and implementation of the technical aspect of the project. They will also act as the technical expert on project (tools, documentation, etc.). Moreover, they will also help designing test cases for each of the components of the product and help with the debugging process.

Scope and Limits

As we have stated many times in the previous sections, due to limited time and resources, we will only do phase 1 which is motion detection. The second phase of our project proved to be too difficult and there is no suitable technology that can recreate feedback effect at the moment. In contrast to that, the suit is achievable if we only do the motion detection part, as some company have already made a similar suit.

Timeframe

Please go to the link below to view our team Gantt chart.

<https://docs.google.com/spreadsheets/d/1gIDMdiZ7ouO0GiAQhPwuroAdYDwXEOMJzWj2a9Q0fWQ/edit?usp=sharing>

Tools and Technologies:

As you can see on our website, our VR suit is the most developed technology to support gamer in order to improve their experience while playing games. Our VR suit used some kind of technology like Vive or Oculus with kinetic mirror. Vive and Oculus are VR technology software will support for hardware part is kinetic mirror. Kinetic mirror is a very new technology because

it just has been created recently. It has been improved that very fit to our project and help our project get optimized.

Testing:

After finishing prototype, we will let people to test our suit. First, we will let our team member to test and check whether it has any more bugs so that we can fix it early. Second, I am the member of RMIT E-sport Club which gather many gamers who have a strong passionate about games so we can have a lot of people to help us evaluate our prototype. We have to make sure that the suit can be fit for everybody and they are all felt comfortable when wearing it. In addition, we will modify it to provide the most wonderful gaming device to experience to all gamers.

Risks:

VR suit is a new and early technology. Therefore, risks are always existed, and we have to determine and develop it in order to keep safe to testers and users. In our project, some special risks can be caused to the users like disconnection to the suit, the signal of interact too strong which causes injuries to users. Moreover, suit can cause skin problem such as allergy or worst is skin cancer.

Group processes and communications:

We have a regular team meeting every Monday. We usually spend about 1 to 2 hours to discuss about the project and our jobs. In addition, we show the progress to each other in order to improve and help to finish our work more efficient. Facebook messenger is the most common way we use to do our tasks and discuss with other group members.

Skills and Job

Lead Developer:

Skills require:

- Python or Java.
- Have experience in working with big data and AR/VR technology.
- Be able to communicate and work well in a team.
- Speak English fluently.

Reasons to do this job:

- Have a friendly and professional environment to work.
- Work in potential project about future technology.
- Build a strong infrastructure to work for a better company or group.

Quality Assurance:

Skills require:

- Be able to write a detailed report on bug.
- Have some experience in working in quality assurance field.
- Have knowledges about coding or computing.
- Be able to communicate and work well in a team.

Fluency in English.

- Reasons to do this job:
- Have a friendly and professional environment to work.
- Work in potential project about future technology.
- Build a strong infrastructure to work for a better company or group.

Project Manager:

Skills require:

- Have overseen and deliver a project successfully from start to end
- Be able to communicate and work well in a team.
- Have wide knowledge about computing and coding.
- Fluency in English

Reasons to do this job:

- Work in a friendly and professional environment.
- Work on innovative project that implement future technology.
- Help build a strong infrastructure to work for a better company or group.

Firmware engineer:

Skills require:

- Have experience in working with program and controlling devices like car or computer.
- Have a strong knowledge about developing and fixing system operating.
- Good communication skill and work well in a team.
- Able to speak English fluently.

Reasons to do this job:

- Have a friendly and professional environment to work.
- Work in potential project about future technology.
- Build a strong infrastructure to work for a better company or group.

Feedback

Ngan Phan:

Because we did assignment 2 together and we also have known each other about our strengths and weakness so, in assignment 3, we are easy to exchange information. My team is doing quite well, all members are equally given the same work. Regarding the content, it is difficult to find out the information about our product, so we are trouble with this section. Khai is the person who writes the most code because he has a lot of knowledge about creating a good website, he did a great job in this aspect and he helped other members when they have problems with coding, but he also gave the difficult topic which is complicated to discover its information. Dung is the one who is quite lazy, because he does not understand more about coding so he makes some mistakes on the website, but he usually completes his assigned work well, he completed his work on time so a leader who is Khai can have more time to check. Anh Minh does not wait for the last days of the deadline to start working like assignment 2 but he needs someone to remind to do his job so sometime he forgot to do it, but He is good at finding information when I cannot have any idea, he also gives me ideas and also find the information for me. I am bad at coding so sometimes I make Khai angry because I make coding wrong and the website becomes a trouble and he lost more time to fix it. Therefore, my members do not let me do the coding part, I am responsible for the content for the group, I help them to find the images for the presentation, I also design the slides and the member in the group will watch it and they will give me their ideas so that I can change and everybody is satisfied.

Dung Nguyen:

Thanks to our cooperation on the Assignment 2, we have understood our strong and weak so that we can give each other help when there is a need between members. We have divided the work quite equally. Khai nearly take all the hard part while he creating the code and designing our group website. He also spends time to check our work to make sure that we are doing right. Ngan have to collect the data and create the presentation for our group so that we can have time to do other things and tasks. Minh Anh is quite lazy in his work and we have to encourage him to finish his work on time. However, he tries very hard to learn new things and focus on his work. I work with Khai on doing research about our group project VR suit. I think I doing my

works faster than before so that our group have more time to sit together and look again our jobs. In addition, our group have a good work and members are knowing which ways to do their task more efficiency to help other members.

Anh Minh:

Thanks to assignment 2 it allowed us to see each other's strengths and weaknesses and from there it was easier for us to divide everyone into the right parts for them. Khai often does the code parts and the code parts because he does code and decorates very well, so that part is very suitable for him. He is the one who divides the work for everyone on the team and often helps everyone on the team when it is difficult. Dung is a very good performer in writing and research. He often contributes good ideas to the group when the group needs to find other solutions. Ngan is the only girl in the group, but she does almost everything well and she helps me out when I don't understand because I often ask her what I don't know, and she is willing to help me. I am a person who is often prompted to do my parts because I often forget the parts that I need to do. I am good at research and comments which will help the team a small part in solving problems. Finally, for future projects and teamwork, I will be more active and stay on track with the team.

Khai Ngo:

After ten weeks of working together with the team, I have gotten to know everyone pretty well and gained some experience in managing a project. For me, I think I have tried my best to distribute the team workload and push the project to finish. However, there are still some aspects that I need to improve, like setting a mini deadline and communicating effectively with everyone. For everyone else, I think they have done a good job of carrying their own weight. For Ngan, I think she is the most responsible one out of three members. Moreover, she is willing to take some challenges in the assignment. In this assignment, I have assigned her to be the leader for the presentation part of our assignment, and she did it very well. For Dung, I think he more hardworking in this assignment, although he still waits pretty close to the deadline to do his tasks. However, he did get all the job I assigned to him well and sooner than I expected. Lastly, M.Anh, I for this assignment, I think he has improved a lot but there is still room for improvement for him. Moreover, because he has lost his student ID card, we were not able to talk to him face-to-face for several weeks. However, as Ngan reported, he did carry his weight this assignment and not being lazy. Overall, I still think the team communication have improve a lot since our first weeks working together with each other. Furthermore, I think some of them have begun to mature and completed their work before the deadline set by the team. This is one the improvement I hope will continue.

Group reflection

Overall:

After working together in 3 weeks, the Iced Tea group which includes Khai, Ngan, Dung, and Minh Anh, was completed the assignment. When we did assignment 2, we learned a lot from it such as teamwork skills and job organization skills so when we start to do assignment 3, we do not worry much because we understand each other. About the content, because we are doing about VR suit which is very little information available online and it is incredibly difficult to implement, even for those who specialize in the industry. Therefore, In the plan and progress part, we do not have a lot of ideas for it. We need to improve our web programming skills so that we can do it more effectively because Khai knows web-making well, so he does the difficult parts, and the other 3 members do the easy parts of web programming. Therefore, we need to improve our knowledge to be able to do the difficult parts and can also set up a professional website for ourselves. Moreover, we need to find out more information about the product we are working on because many products are not easy to do so we should think carefully before working on a project. Additionally, we should have more meetings to motivate members to work because when we do together, we will be easy to ask team members. Ngan studies in a different tutorial class with other 3 members of the group so it tends to be difficult for us to meet each other. What surprised us the most was the help between the team members. Everyone always helps each other when facing difficulties, not alone. Usually, the groups will split the work and do it themselves, but the Iced Tea group is different, we always support each other, when members have problems, they just need to message on Facebook and the other members will assist immediately. One lesson we learned after forming the group is teamwork and organization skills. In addition to those skills we also learned to think carefully before making decisions, like we need to think about the future when working on it not only because it is easy to do now. We acknowledge that although the team has many good members, they do not have solidarity, they will not be able to get the job done. We know how to organize the tasks for the team members very well to be fair to everyone.

Ngan Phan:

In my group, I think I have not done really well in terms of giving my opinion to the members. Because we did the assignment 2 together so we have known about the strengths and weaknesses of each other so we split the appropriate parts, members who do good a part will be assigned to do this part. Therefore, I have contributed to do the presentation, I have searched for the images for the slides, and because I like the design for the poster and drawing pictures so I am responsible for the design slides to make them look attractive to the audience. Additionally, Designing the slides is difficult because the different members are separated so

they don't have the same opinion, so I consulted the members many times to give a general idea for the slides. Furthermore, I also contributed to the group reflection section, I help my team to recognize their shortcomings and the lessons they learned from this assignment. Because this part has a low score in assignment 2, I am worried to do this so I told the members who will do well this part, but they believe I will do better. I hope I can study more about writing code from Khai and have a good group refecton.

Dung Nguyen:

Our group have the time to work together on the Assignment 2. Therefore, we can divide the works to be suitable for group members. I take part in doing research about tools & technologies, test, risk and skills & jobs. Doing research about these topics allow me to acknowledge a lot of useful information. I share these works with my leader because we are the one who understand the project most among the group members. Moreover, I think that I have done my work better and faster compare to the work progress I have done in Assignment 2. Therefore, our tasks have the finish time faster than normal and we can use the spare time to check the project again and prepare for the presentation which is very important on this semester. I am still very bad at connecting with the members in my group and still let the leader ask me to finish my work. This is the things I have to change if I want to improve myself and get a higher mark at next semester. I feel very grateful to my group members thanks to their help that help me during my studying time.

Anh Minh:

Assignment 2 made us closer together when we finished it together. After that, we shared very easily and equally with each other knowing who had strengths in different parts. I think I'll do a good job of research and I often share my ideas with the team. I thank people so much for helping me so much in doing the post. I often forget what I need to do so people often remind me to finish my part. They usually care about me when I don't know how to do it, they can change me, and the part and I feel very happy about it. I often ask parts I don't know and everyone just burns enthusiastically. The post we finished early and we had more time to prepare for our presentation and the wire was also the part that I felt most worried about. I can't link or support the team much in terms of knowledge, but I can do a good job of connecting team members together and trying to do the best part that I'm assigned. I am very proud of my team and I hope the following courses can be shared and done with them.

Khai Ngo:

Our group, for the most part, has worked smoothly with each other. As time goes on, our communication has improved, and we got used to each other. Furthermore, for this

assignment, the group has successfully worked independently in a smaller group and got everything done on time. For me, I have now known whom to trust and gave her a leading role in that group. Because of that, it has reduced my workload and responsibilities. However, one thing that still needs to improve is our group plan to do the assignment. Like last time, this time the group finished pretty close to the assignment deadline and not leaving much time for reviewing the report. Apart from that, one thing that surprised me this time is how Dung work. He had finished all the tasks assigned to him before the team deadline and willing to do more. In addition to that, Ngan also finished the tasks I gave her sooner than expected, so there is some improvement from their perspective. Because of that, I have learned to give people more responsibility for their work and divide our workload more evenly among everyone. Finally, just like last time, our team use GitHub to collab with each other, although this time we did not use it as much since only two people are writing the main part of A3. Hence there is not a lot of commits from Ngan and Minh Anh.