***RMIT University***

***School of Science and Technology (SST)***

***COSC2083 – Introduction to Information Technology***

**Assignment 2: The IT World**

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*I declare that in submitting all work for this assessment I have read, understood and agree to the content and expectations of the Assessment declaration.*

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1. Team Profile

Deciding a team name is crucial as I want a name that can represent the dynamic of teamwork in the team, while also grabbing the attention of others. Because of this, I would like to name my team as Team Ghidorah.

In a group consists of 4 people, I would first like to work with individuals that can step up and take the role of guiding the team as a leader. As an introverted person, I don’t have the necessary leadership skills to give out efficient instructions as well as managing everyone progress since I tend to work better alone and concentrate on doing thing at my own paces. In additions, my decisions making sometime can be heavily influence by my emotions and would lead to undesirable outcomes. Due to that reason, having a leader early on can benefits the team as the leader would communicate effectively with team members, keep track of important deadlines and make the hard choice on the behalf of the team to achieve the greatest results. Secondly, I would like to work with people who are flexible in dealing with challenges and sharing their ideas regularly. Being an observant and prospecting person, I focus on listening carefully to other opinions before voicing out ideas of my own and facing problems with many ways of approach. For this reason, having people who willingly share their ideas and prepare for challenges would not only helps team member to collaborate actively with each other’s but also allow the team to capitalize on new opportunity when dealing with challenges. Lastly, I would like to work with people who have strict habit that committed to improving themselves. These type of individuals are perfectionist that aim to be the best and as such, having them in the team would both motivate and encourage other members in the team to push on with all their efforts.

1. Tools

So far, I have created a repository for my assignments so that I can keep track with what I have done as well as edit whenever I want.

This is the link to my GitHub repository: <https://github.com/Long-Conor/Assigments.git>

This is the link to my webpage: [file:///E:/RMIT/First%20Year(2020%20-2021)/2021/Sem%202/Introduction%20to%20IT/Assignments/Assignment%202/S3877624\_IIT\_A2.htm](file:///E:\RMIT\First%20Year(2020%20-2021)\2021\Sem%202\Introduction%20to%20IT\Assignments\Assignment%202\S3877624_IIT_A2.htm)

1. Project Ideas

Due to the ongoing pandemic happening in Vietnam, the people are instructed to stay inside of their home and avoid direct contact with other people until further notice. This resulted in the increase of people demands for daily good as they are restricted from entering crowded places such as supermarket or convenient stores. Moreover, delivery people or door-to-door distributors are also limited on how many time they can go out and deliver the goods to people in need. Hence, the project is aiming to develop and provide a grocery pick-up robot for the sake of counter the act of going outside during the COVID pandemic lockdown.

The idea for this project first come to mind after being stuck inside of my own house for multiple months without the access to the usual items I use every day due to the official instruction the government broadcasted across the country that restrict people from going outside to restock. As time go on, COVID cases in Vietnam escalate more and even reaching over 200 000 cases in August of 2021 according to the Ministry of Public Health of Vietnam**[1]**. Because of this, it motivates me to find an alternative to restock on goods without personally going outside through the utilization of Raspberry Pi and Robot as it proves to be inexpensive and a practical solution in solving the problem.

Currently, the entirety of Vietnam is heavily under lockdown due to the dangerous COVID pandemic especially in Ho Chi Minh city where both the people and government are affected the most with the number of COVID cases reaching up to nearly 50% of total cases **[1]**. As a result of staying inside for too long without daily needs being fulfilled, some of the people decided to go out of their home and went to crowded places to satisfied their needs despite the strict instructions given by the government. To address the problem of people constantly going outside, the government created an order where only people granted with a permit would be allow to go out and those who don’t have a permit would be fined and force to go back to their home. In additions, the government even set curfew time and limit the amount of time delivery system can be used since coming in contact with delivery people would likely to increase the chance of spreading the virus. Thus, I came up with the idea to solve this problem by developing a robot and sending it out to pick up grocery instead of sending out human. The Pick Up Grocery Robot or P.U.G for short is robotic machine which serve the purpose of going out to the designated location assigned by the user so that the robot can gather all the required grocery and deliver them back to the user location. The robot is monitor and can be remotely control from far away by the user through an app utilizing the operating system embedded in the Raspberry Pi. The outer appearance of the robot resembles similarly to a shopping cart with metallic exterior, 4 legs with each having a wheel to move around, two small speakers attach to each side of the robot, a small microphone stick to the side of one of the speaker, a camera hook up to the front of the robot and the battery supply at the end. Whereas, the inner appearance of the robot consists of the Raspberry Pi where the outer equipment is connected to and many of the circuits that run through the robot. The robot work by first receiving a command from the user to travel to the location that the user has appointed to. During it journey to the location, the robot would use it front camera to sense it surrounding environment and track down the quickest way to the location while also avoiding any obstacles that might damage or stop it from proceeding the journey. Upon it arrival, the robot would engage with the seller (to grab their attention) where the user could then communicate and project their voice through the speakers. From here, the seller can also communicate with the user and ask what they would need by using the included mic that stick to one of the speaker which can be pull out so that it can be use more easily. After acquiring the needed goods and paying the seller through credit card transaction, the robot would use the same route to go back to the user location. One of the many benefits from using the robot would be that it is safer for the user as they can comfortably stay inside of their own home and won’t have to go outside during the pandemic. Additionally, this proves to be way more convenience and can be used for a very long time throughout the pandemic. However, the drawbacks would be that the connection limit where the maximum distance the robot can go is only 5-6 kilometers and there is no guarantee that the robot can recover itself if there was an accident that cause damage to the robot or if there are people who want to steal the robot entirely. Even so, the robot is created with the intention to help Ho Chi Minh City ‘s resident under the pandemic lockdown to restock on goods without having to leave their home.

In order to develop the robot, the equipment needed for the project would be a Raspberry Pi 4 (prefer to be a 4GB model or even better with 8GB model) running the Raspberry Pi OS install on the board that support programming languages such as C/C++, Python 2/3 or Scratch and a battery source to supply the robot with power. Additionally, the robot would need an attachable camera like the Raspberry Pi Camera to detect the surrounding and make sure to travel correctly to the designated location as well as having a small microphone and speakers so there can be an effective communication between the buyer and seller. Furthermore, the robot would require to have a container resembles similarly to that of a shopping basket with wheel for the purpose of storing the goods.

For the project to become a reality, it would first require to have coding skills ranging in multiple programming languages (where Python is most prefer) with the level of experience extending from intermediate to advanced level. Secondly, I would need to obtain building skills in order to not only construct the robot with the help of constructing software such as Solid Work but also ways to maintain the robot for a long duration. Lastly, I would need to acquire marketing skills to be able to push the project into the media eyes and grab the attention of sponsors. Beside from the hardware and software, which can be easy to obtain, the skills listed would be more difficult to find as I would need to either find people that meet these requirements or develop those skills myself through intense studies.

In consideration that the project has a chance to be successful, the desirable outcome I want to achieved from the project would be providing a safe and secure delivery system entirely by pick up robots to the citizens of Vietnam, especially in major cities such as Ho Chi Minh. By sending out robots instead of humans, the project would help to reduce the growing amount of cases where people are spreading the virus through direct contact while allowing the government to monitor the people more easily. Likewise, this project would also open the door to new opportunities in the developments of robot being used for other fields in the distant future.

1. IT Technologies (Robots + Raspberry Pi)

My project idea utilizes the function of a Raspberry Pi to build a grocery pick up robot so the project would revolve around the technological area of Robotics and the small computing device known as the Raspberry Pi. The Raspberry Pi is a low cost and mini sized computer capable of helping people from all ages ranging from curious youngsters to old adults to engage in using computers and helps them learn how to program in various programming languages like Python or Scratch. There are multiple models available for the Raspberry Pi, with the most recent model being the Raspberry Pi 4 completely upgraded with more features like a more powerful processor, extra RAM choices and a lot more useful ports. On the other hand, robots are described as any man-made machine that built for the purpose of replicating specific actions to perform work either by remote control under human influences or automatically by itself. **[2]**Robot don’t have identical models since each would serve a different purpose for different reason but they are composed into 3 main part of the Controller (which processes the information given to the robot from a computer program), the Mechanical (which consists majority of the robot parts that helps with its movement and function) and the Sensor (which helps the robot identify its surrounding). Both the Raspberry Pi and robot are state of the art in the technology world with the Raspberry Pi first developed it prototype back in 2006 and the first company to formed using robot was in 1956 **[2]**. Currently, the Raspberry Pi offer it users with the ability to interact with the outside world just by plugging it into any monitor along with using the standard keyboard/mouse setting to come up with ideas and develop their own personal projects. For instance, the Raspberry Pi can help to design a network monitoring tool where it allows you to monitor your important network data or help to make a portable streaming device where you can easily access to watching shows. Whereas, robots in the modern world are being used mostly in industries as robot helps business to increase in productivity and able to work in an environment that is consider hazardous for regular human being. For example, robot working in automobile manufacture are able to carried out repetitive tasks in large quantity without complaining. In the next 3 years, the improvement of the Raspberry Pi from the release of newer model would allow to unlock even more potential for the active community to discover and encourage to develop more incredible projects on the tiny but powerful board. Similarly, the improvement of robot in the next 3 years would allow robots to diverse themselves in other working areas as it is predicted that they are being mass produced by major companies in 2021 and will be taking over half of the work tasks from around the globe in 2025 **[3]** which can be a good thing as it lead to the establishment of a new market for increasing demands in new jobs. Other implementation of technological developments such as cloud computing with Raspberry Pi and especially artificial intelligence in robot play a key role in making these expectations to be possible. For Raspberry Pi, the integration of cloud computing allows users to host their own remote servers and stored their data more securely. For robots, according to Industry Week **[4],** the integration of AI would benefit robot to feel more alive as existing robot home assistant like Echo and Google Home would be provided with more useful resources to improve and deepen the relationship between users and devices.

While the development of the Raspberry Pi proves to only bring in positive impacts as the advancement of the small computing devices would sparks new innovation to emerge, the development of robots acknowledges the fact that the world would surely experience the potential of both positive and negative impacts. For the negative impacts, robots are likely to cause changes in work force due to around a third of the world’s work tasks were already being handled by machines and now is causing a shift in the balance where it is expected that over half of all low-skilled jobs such as farmers or front desk receptionists would be at risk of being taken over by robots **[3]**. Furthermore, the inclusion of robots might also impact the human capabilities and interaction where it causes us to be less capable in doing common tasks, taking away our abilities to think for ourselves and isolating us to be lonelier overtime. However, there is still light at the end of tunnel as robots provide as many jobs as they take where there would still be opportunities for brand new jobs to be discovered or already existing jobs such as coding and engineering related jobs would get a boost to promote the needs for more workers. Even though majority of the work force being affected the most by the replacement of robots are people from the working class as well as the less educated people, there is still hopes of assisting them by providing with proper education accompany with additional training to enable them to adapt with new given jobs.

In my daily life, the existence of robots alongside with the Raspberry Pi being commonly used everywhere would affect me physically and mentally but in a good way. Physically, the robot would create a safer environment to be around since all the dangerous would be handled by them, allows me to relax and take care of myself better. Mentally, by having all of the menial tasks like housework and noting down important details to be monitor by using the Raspberry Pi, this allows me to be more comfortable and be more productive more other works. All of this would be different for me to adapt to but like all technology, I can easily get used to it after sometime with it. This would also affect my family greatly where the implementation of the Raspberry Pi would help my grandma to get into using computers and the assistance would help my mom organize housework better. Moreover, this would also benefit many of my friends who are interested in technology to get robots and utilize them in their own household.

1. IT Work

The first video about the life of an IT professional: <https://www.youtube.com/watch?v=om8AygYdrto>

This IT professional is responsible for providing tech supports through answered phone calls as well as going around the company’s facilities to checked up on equipment for problems that might occur. Moreover, he is also responsible for the management of user accounts and computer imaging (which is the process of saving and transferring software alongside data from one computer to another). Majority of the people this IT professional interact with are clients that he meets at the service desk which is where he spends most of his time alongside with the computer. For this IT professional, the most challenging aspect is the work that he has to do from day to day. He doesn’t work with the same stuff everyday but rather varies as the day went on.

The second video about the life of an IT professional: <https://www.youtube.com/watch?v=M_GVUj86VaY>

This particular IT professional is a software engineer that skilled in designing UI and features for web applications. The type of people this IT professional interact with are other IT professionals in the same profession as him and often time with his managers on a day to day basis. He met up with them so that he can discuss about the progress of certain projects he working on. The place he likely spends most of his time is in the office and in-front of the computer. For this IT professional, the most challenging aspect is the amount of works he deal with everyday which make him feel repetitive and lack of freedom in creativity as he is often forced to stick with only one type of programming language that the company assigned to him. Not only so, overtime is common since he has to stayed longer than expected work time.

The third video about the life of an IT professional: <https://www.youtube.com/watch?v=4OSrjhzJ-B4&t=733s>

This IT professional line of works include designing, writing and testing the source code of the computer program while also handling the design of the GUI so that it be easier to use. The people that this IT professional come across everyday are investors interest in making offers and his coworkers that he interacts with during meetings and important team discussion. This IT professional spends most of his time at his own desk in the office, which he found to be the most challenging aspect of his position since he spends most of that time alone to debug errors in programs and got no extra free time to do anything else.

The fourth video about the life of an IT professional: <https://www.youtube.com/watch?v=9xhY-DPyu9Y>

This IT professional is responsible for fixing PC with problems by checking up on the hardware and software in the computer along with cleaning the PC internal parts when they accumulate dust. This IT professional interact with his clients the most where he spends nearly all of his time in the repair shop at the front desk either waiting for customers or look through placed orders and work on those orders. For this IT professional, the most challenging aspect is mainly waiting for the diagnostic of the broken PC or hardware to finished.

The fifth video about the life of an IT professional: <https://www.youtube.com/watch?v=dEOCo7mYYuA>

This IT professional is responsible for monitoring and fixing issues that link with networks and telecommunication. Likewise, the IT professional is also responsible for resolving issues in a limited time frame as well as fulfilling specific orders and request made by certain clients. The type of people this IT professional interact on the daily are clients, his colleagues and IT specialists for requests that require in-depth solutions. Like most of the other IT professionals, this IT professional also spend most of his time being in-front of the computer at his desk. For this IT professional, the most challenging aspect about his position is that it can very overwhelming due to the massive amount of information being shoved all at once which can be very hard to keep track of. In additions, the job is challenging because it can be very repetitive and time consuming as a result of figuring out the exact user’s equipment or assets.

1. Feedback

After discussing and presenting my project idea about the robot that can helped with picking up grocery during the pandemic, I managed to receive feedbacks from two of my classmates which is from a student named Phat and a student named Hoang. Phat feedbacks said that my project idea have the potential to grow as the idea can be use in different corner of the country where the same problem is occurring and the idea can be useful to provide a helping hand to people around the world. Whereas, feedbacks from Hoang seem to disagree with the concept, Hoang said that the idea is too unrealistic as it proves to be not effective since the range of delivery is limited and there won’t be enough robot to provide for anyone around in Ho Chi Minh, much less to people around the globe. Not only so, Hoang also said that the idea would not be future proof as after the pandemic end, majority of the robot would not put into use since everything would be back to normal and people wouldn’t use them anymore. From here, I understand how useful these feedbacks are due to it exposing the both the good and bad things that lied deep within my project idea and I fully agree with Phat and Hoang feedbacks. Yes, my project idea does have potential for growth but I would need to cover holes that might lead the project to failure. For future improvement, I would use feedbacks from Phat to continue with the things that can bring in benefits while using feedbacks from Hoang as guide to avoid common mistake and to look beyond what happening in the present and toward the future.

1. References

**[1]** "TRANG TIN VỀ DỊCH BỆNH VIÊM ĐƯỜNG HÔ HẤP CẤP COVID-19 - Bộ Y tế - Trang tin về dịch bệnh viêm đường hô hấp cấp COVID-19", *Bộ Y tế*, 2021. [Online]. Available: <https://ncov.moh.gov.vn/trang-chu>. [Accessed: 15- Aug- 2021].

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[**3**] BBC News, "Machines to 'do half of all work tasks by 2025'", *BBC News*, 2021. [Online]. Available: <https://www.bbc.com/news/business-54622189>. [Accessed: 16- Aug- 2021].

[**4**] I. Staff, "79 Million Homes Globally Will Have a Robot in Residence by 2024", *Industry Week*, 2021. [Online]. Available: <https://www.industryweek.com/technology-and-iiot/article/22028128/79-million-homes-globally-will-have-a-robot-in-residence-by-2024>. [Accessed: 16- Aug- 2021].

1. Appendix