UNIVERSITY of GREENWICH
Alliance with FPT Education

BTEC

ASSIGNMENT 1 FRONT SHEET

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Submission date	01/01/2021	**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	
Student Name		**Student ID**	
Class	GCH0715	**Assessor name**	Do Tien Thanh

Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student's signature	Thuy

Grading grid

P1	P2	P3	P4	P5	M1	M2	M3	D1	D2

❒ Summative Feedback:	❒ Resubmission Feedback:

Grade:	Assessor Signature:	Date:

Internal Verifier's Comments:

Signature & Date:

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A. Introduction

Mobile technology is increasingly recognized as an effective platform for improving behavior change. Furthermore, the use of mobile computers, mobile devices and information, and communication technology is increasingly expanding into the healthcare industry as platforms for behavior change. This study shows that mobile apps are capable of improving your own healthy eating habits and weight management on the basis of scientific and nutritional information. However, further studies are needed to find out if these interventions have long-term sustainable benefits and can be used effectively on a large scale. This report will research and evaluate the impact of technology management applications on students.

B. Purpose of the research

I. Project Scope

Mobile technology is increasingly recognized as an effective platform for improving behavior change. Furthermore, the use of mobile computers, mobile devices, and communication technology is increasingly expanding into the healthcare industry as platforms for behavior change. This study shows that mobile apps have the potential to facilitate improving your own healthy eating habits and weight management on the basis of science and nutrition information.

We study the effects of weight management on users. Specifically, our target audience is university students. Here we provide the MyfitnessFal application to students from 5 universities around Hanoi for 2 weeks of use. After 2 weeks of use, we surveyed 30 participants, interviewed any 1 user and observed 1 user wishing to lose weight in 1 week to gather information about their eating habits. and how user behavior has changed during before and after use. The collected data will be analyzed objectively, then draw conclusions about the impact of the weight management application on users.

II. Project Objective

We conduct research on how weight management applications affect users' health and behavior. Our goal is to evaluate the accuracy of weight management applications and the impact of technology management devices on self-monitoring of weight:

Some points of the report:

- The MyfitnessPal weight management app accurately calculates the number of calories a user consumes every day based on the food they consume.
- Weight management app helps users to build healthy eating habits.
- Build for users the habit of combining healthy eating and daily exercise to burn excess calories.
- Helping users to be aware of the effects of weight on health, and self-consciously learn about nutritional information.
- Promoting self-weight is a healthy lifestyle.

III. Project Schedule

1. Work breakdown structure

This is work breakdown struture followed in below figure:

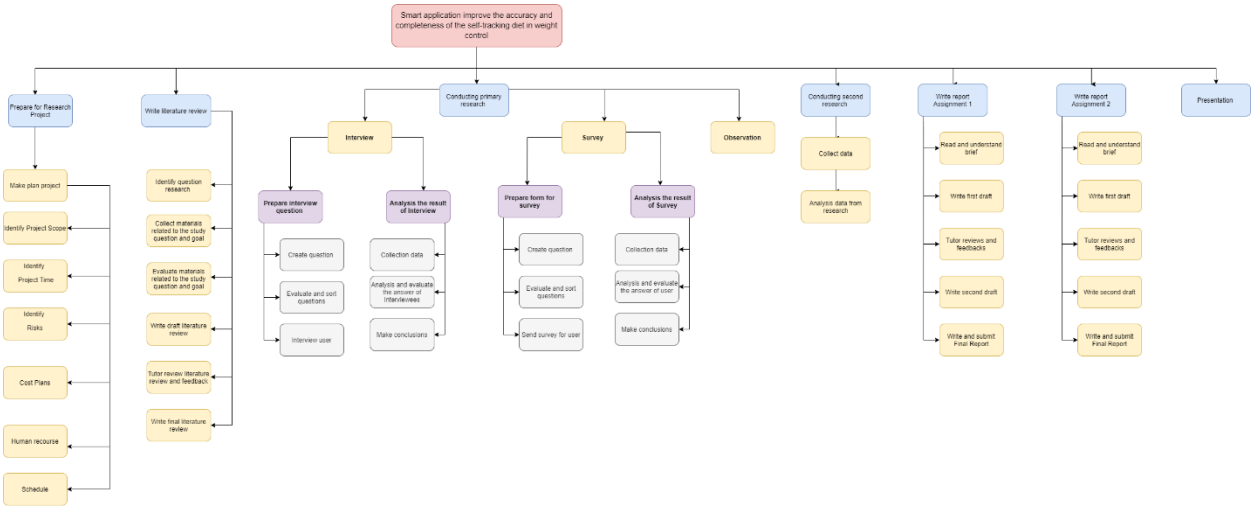
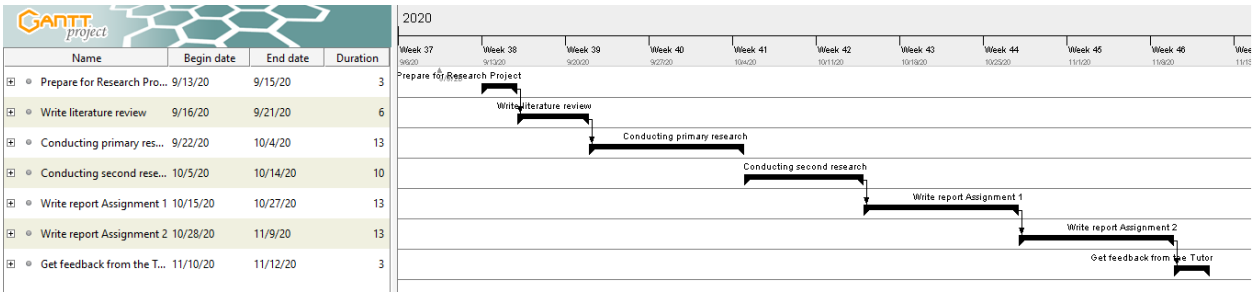
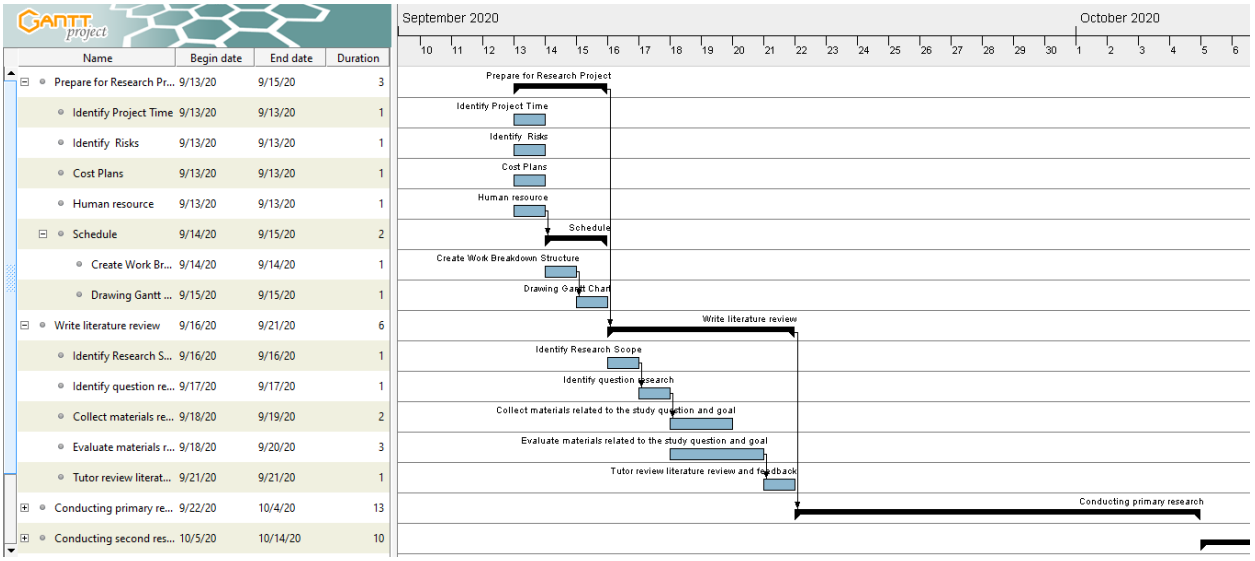


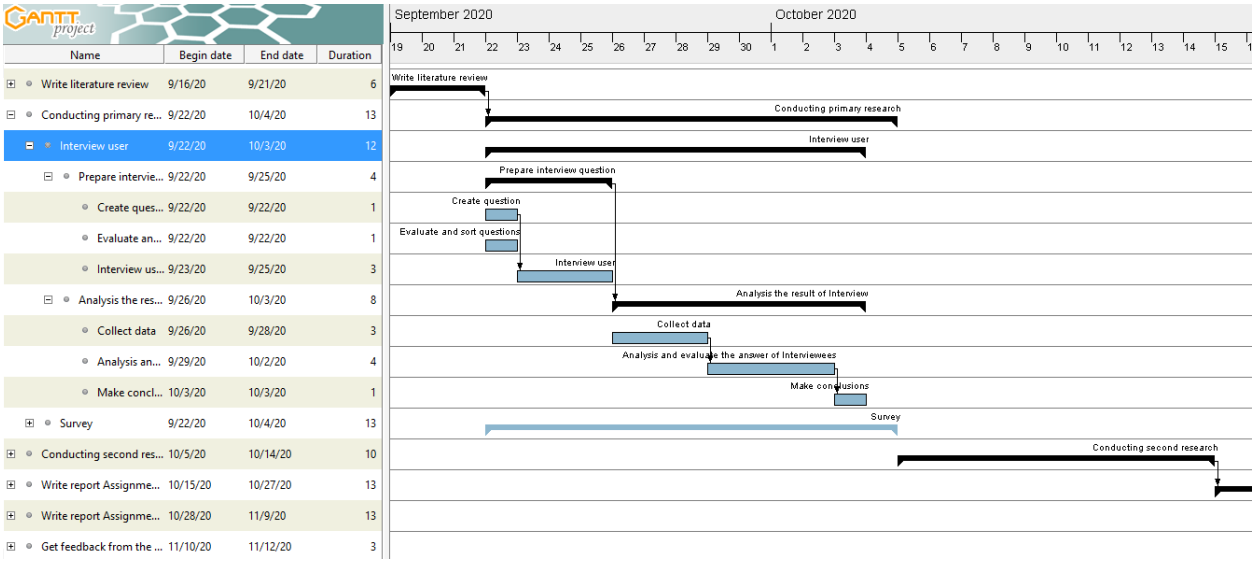
Figure 1: Work breakdown structure

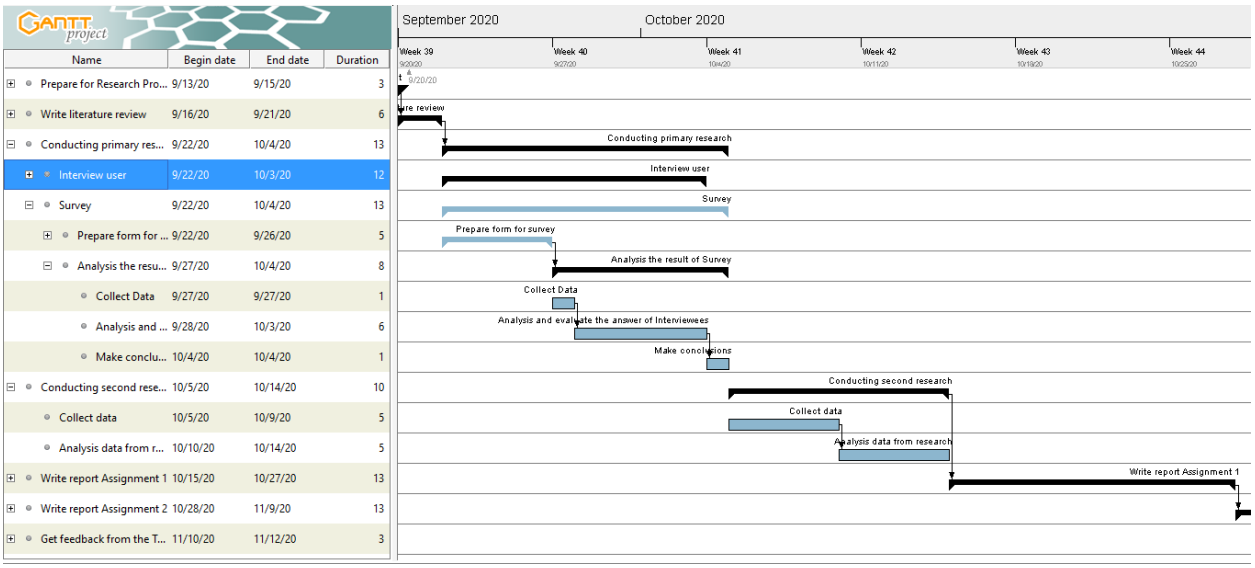
2. Gantt chart

The timeline of research is showed in figure below:






GANTT project
Name
Begin date
End date
Duration
Write literature review 9/16/20 9/21/20 6
Conducting primary re... 9/22/20 10/4/20 13
Interview user 9/22/20 10/3/20 12
Prepare intervie... 9/22/20 9/25/20 4
Create ques... 9/22/20 9/22/20 1
Evaluate an... 9/22/20 9/22/20 1
Interview us... 9/23/20 9/25/20 3
Analysis the res... 9/26/20 10/3/20 8
Collect data 9/26/20 9/28/20 3
Analysis an... 9/29/20 10/2/20 4
Make concl... 10/3/20 10/3/20 1
Survey 9/22/20 10/4/20 13
Conducting second res... 10/5/20 10/14/20 10
Write report Assignme... 10/15/20 10/27/20 13
Write report Assignme... 10/28/20 11/9/20 13
Get feedback from the ... 11/10/20 11/12/20 3
September 2020
October 2020
19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Write literature review
Conducting primary research
Interview user
Prepare interview question
Create question
Evaluate and sort questions
Interview user
Analysis the result of Interview
Collect data
Analysis and evaluate the answer of Interviewees
Make conclusions
Survey
Conducting second research


GANTT project
Name
Begin date
End date
Duration
Prepare for Research Pro... 9/13/20 9/15/20 3
Write literature review 9/16/20 9/21/20 6
Conducting primary res... 9/22/20 10/4/20 13
Interview user 9/22/20 10/3/20 12
Survey 9/22/20 10/4/20 13
Prepare form for ... 9/22/20 9/26/20 5
Analysis the resu... 9/27/20 10/4/20 8
Collect Data 9/27/20 9/27/20 1
Analysis and ... 9/28/20 10/3/20 6
Make conclu... 10/4/20 10/4/20 1
Conducting second rese... 10/5/20 10/14/20 10
Collect data 10/5/20 10/9/20 5
Analysis data from r... 10/10/20 10/14/20 5
Write report Assignment 1 10/15/20 10/27/20 13
Write report Assignment 2 10/28/20 11/9/20 13
Get feedback from the T... 11/10/20 11/12/20 3
September 2020
October 2020
Week 39
Week 40
Week 41
Week 42
Week 43
Week 44
Conducting primary research
Interview user
Survey
Prepare form for survey
Analysis the result of Survey
Collect Data
Make conclusions
Conducting second research
Collect data
Analysis data from research
Write report Assignment 1

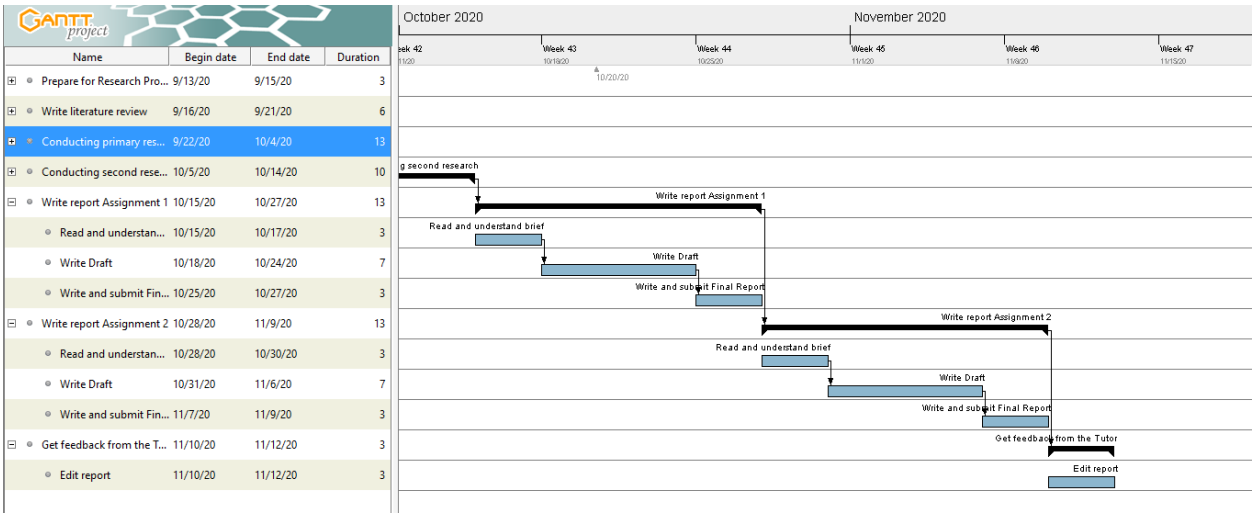


Figure 2: Gantt chart of research

C. Literature review

I. Review Digital wellbeing in general

1. Definition

Base on (KENNEMER, 2018), at Google I / O 2018, Google announced Digital Wellbeing. Digital Wellbeing is Google's initiative to help you understand your tech usage and help take back control of your life if that's something you feel you need. It's a combination of many things, including data and insight, tools, apps, content, and more, all of which are designed to help you put the living part of life back into perspective. Also, a whole new approach to OS and application development that will equip users with tools to help them find a better balance between their digital and real worlds.

According to (Shah, 2019), Digital wellbeing is a term that describes the impact of digital technologies and services on people's mental, physical, and emotional health in a measurable way. Considering this concept in the personal context is to identify the positive and negative effects of each individual when participating in the digital environment, there by understanding how to manage and control to increase well-being. Like using digital tools to pursue personal goals, healthcare, relationships, work-life balance, act responsibly in a digital environment. From a broader perspective such as the organization or the entire society, it is the responsibility of service providers to ensure that their systems, services or digital

content are well managed and supported, accessible and fair. They also need to empower and build their teams, users, and partners to engage in ways that support and improve their well-being.

In fact, the harsh effects of internet use and excessive smartphone use have long been talked about, with smartphones increasingly attracting our attention as years pass. by. The definition of Digital Wellbeing by (KENNEMER, 2018) is still correct, the goal of Digital Wellbeing is always looking for a balance between users and technology equipment, to help you understand how to use your technology and help control revisit your life in many different areas such as health, finance, and automation of life. However, recent studies show that an increase in smartphone use correlates with an increase in human mental health problems, such as depression. This focus is very precise with Digital Wellbeing's definition of (Shah, 2019). It describes the mental, physical and emotional health of people in many contexts influenced by the digital age. From there, people find the appropriate ways to use technology to benefit users. As for their credit, Google research shows that more than 70% of smartphone users are looking for help in this area. Summary, Digital Wellbeing is a concept first published by Google in 2018. Later, this concept was developed more generally to describe the mental, physical, and emotional health of people in many of the contexts influenced by the digital age. From there, people can control and utilize technology intelligently to bring many benefits to individuals (such as life, work, and relationships) to the whole organization (such as optimization, management). staff), without being dependent on or negatively affected by them. Up to now, many software and features have been born to support such as Rescue Time, Screen time, MyFitnessPal,…

II. Review the impact of digital wellbeing on human being in the past and current now

This section will present the positive and negative aspects of human well-being, both physically and mentally, mentally, and emotionally that the benefit of technology brings.

1. Advantage of digital wellbeing on human

According to (RSPH, 2017), Digital wellbeing builds positive expressions. Research on health phenomena shows that the act of learning about other people's health experiences can be very beneficial for people with health problems. Reading blogs or viewing vlogs about health issues, health promoted campaigns, other people's personalities can improve awareness of human health, timely access to relevant medical services, and Allows individuals to better interpret their own health circumstances. Digital technology

has become an indispensable part of healthcare and is all set to revolutionize medical practice. Digital technology has significantly improved performance relative to healthcare standards. The conversion of digital technology (Digital Transformation) has significantly enhanced the overall experience of the specialist health care, patient, or even the normal individual to monitor and improve health by setting equipment and applications of digitization.

According to (Chen, 2016), Digital welling helps prevent social isolation, reduces user loneliness: Social isolation is defined as the lack of contact with people. Based on definition and quantity, 7% to 24% of the elderly aged 60 years and over are socially isolated, and 7% for the other age group. More importantly, social isolation affects physical and mental health, the risk of depression and self-harm (drug addiction, alcohol, suicide). Nimrodoi results from a 2013 survey of online depressive communities show that strong participation in such communities increases benefits such as emotional support and leads to improved life. real life. Connect with like-minded people and have the opportunity to choose from interactions that improve the perception of others. More generally, the Internet for selective communication provides numerous opportunities to connect and interact socially with people with similar interests or attitudes over time and in Information and Communication Technology (ICT) spaces.) can help overcome social barriers by providing a variety of affordable and accessible communication tools that connect family and friends anytime, anywhere. According to research by Jaspaljeet Singh Dhillon, information technology and communication such as Facebook, gaming community, online community increase social interaction, reduce user loneliness. Digital tools to help build and maintain relationships. In a survey of 100 families, people with a large number of bridging social relationships showed stronger social cohesion and using the Internet more often, which increases their quality of life (Kavanaugh, Reese, Caroll, & Rosson, 2005). A positive relationship between social and mental health was found in a meta-study of adults over 50 years old, based on 11 studies with large samples (Moritz BüchiNoemi 2018, Chen 2016).

In addition, digital wellbeing also supports daily activities, helping to save time such as shopping, communication, and save costs such as travel expenses, medical expenses. Digital tools are becoming more and more diverse in all areas of life, so many digital applications and devices are born to support daily activities to make life more comfortable and easier (Chen, 2016).

Cover (Garage, 2018), they consider digital wellbeing helps people control the use of smart devices and sets boundaries for real-time space and time. Technological nature is not bad, it is important that people know how to use it properly and not depend too much on it. There are many benefits to having a balanced relationship with technology. Another benefit, digital wellbeing reduces the time spent using a high-tech device but makes use of it efficiently and meaningfully. Moving a little further away from technology keeps people closer to themselves and their feelings. Ensuring sleep, rest, less stress, anxiety, reducing the possibility of psychological diseases. Last but not least digital benefits help people stay more focused. This will increase labor productivity and work more efficiently. Commenting on how to work effectively multitasking is quite wrong. People do not focus when switching from one screen to another. Recognize the amount of distracting smart device notifications at work. Each time distracted from the announcements; it took more than 20 minutes for humans to focus again. It is really important that users have the opportunity to relax and stay away from technology for a while, it helps them to work more efficiently when returning to work in a digital environment.

2. Disadvantage of digital wellbeing on people

According to (RSPH, 2017), users tend to be addicted to online, social networks. They check notifications, equipment constantly; depraved cultural products. The concept of 'Fear of Missing' (foMO) is a relatively new thing and has evolved rapidly. FoMO is characterized by the need to constantly stay connected with what others are doing, so as not to miss out. FoMO has been strongly associated with an individual with a higher level of social media engagement, meaning that the more an individual uses social media, the more likely they are to experience foMO.

Moreover, personal information may be leaked by users. Technology causes a lack of privacy, in which anyone can with a few taps on the keyboard find anyone's address and contact information, so every fraudulent use, Viruses, and hacks are both possible with the aim of finding any information they want. Security researcher Bob Diachenko found a database of user account information including their names and phone numbers for 267 million Facebook users. It is available in an unprotected format and copied to other hacker forums. Reports indicate that this represents a data warehouse for telemarketers and spam providers as the data appears legitimate and comes from the social network itself rather than from an undue source trust (Brandon 2019, Chen, 2016).

Base on (Chen, 2016), they consider digital wellbeing is a reason that increase the condition of eye diseases, scoliosis, inactivity: When looking at computer screens and equipment strained eyes, they can reduce vision and increase myopia more. At the same time, using headphones can also cause people to lose their hearing over time. When we use technology like computers, video games or TVs, we usually don't exercise. That is why more and more research is linking the abuse of digital devices to lower fitness and fitness levels. From the lack of daily exercise has caused many diseases such as obesity, high blood pressure ...

According to (Wong-Lo, 2011), they consider digital wellbeing makes cyberbullying has become commonplace. Cyberbullying is a form of bullying that occurs in the digital realm and affects students at an amazing rate. Unlike normal bullying, which only shows obvious aggression when looking at it, the ways to bully cyber-bullying are diverse (texting, video sharing, etc.) The result is attacking others on a technical platform. Digital technology can be disguised as advancing technology. Not only that, a lot of information posted on social networking sites is not true it makes confusing for people.

3. Evaluate impact of digital wellbeing on human

Technology and digital activities affect human well-being in the physical, mental, and emotional aspects in both positive and negative aspects. The degree to which a digital environment affects an individual depends on the context, circumstances, and ability to capitalize on digital influence. There is no denying the extremely positive benefits that Digital Wellbeing has brought to people and society. Nowadays, with the rapid development of technology, digital tools are becoming more and more diversified in all areas of life, so many digital applications and devices are born to support daily activities. make life easier and more comfortable. True like (RSPH, 2017) to say, Digital wellbeing builds positive expressions for people and becomes an indispensable part of healthcare and is all set to revolutionize medical practice. People through electronic devices, blogs, media channels, and people with health problems are actively seeking information about health, which helps to raise awareness about children's health. timely access to health related services and enable individuals to better understand their health situation. The point of (Chen, 2016) brings a different view of Digital wellbeing, it is actually narrowing the gap between people, preventing social isolation, and reducing user loneliness. Connecting with like-minded people and having the opportunity to choose from among interactions improves the perception of others. It also reduces

your risk of illnesses like depression and evils and self-harm. It increases benefits such as emotional support and leads to an improved life. Digital benefits are helping people strengthen relationships, whether it's work or personal. For individuals who are users of Digital Wellbeing products, they clearly realize that digital well-being is bringing a balance between the device and the user. This brings a lot of benefits for users as they put a limit between the time spent using technology equipment and the real lifetime, reducing time using technical equipment and spending more time for rest as sleep, relax. Digital Welfare devices help people focus more on and improve productivity. Besides the advantages that digital wellbeing brings, it also makes the disadvantage of human life. A lot of people agree with the point of (RSPH, 2017), digital wellbeing is making people addicted to social networks, they spend too much of their time on mobile devices and applications. Therefore, they believe that digital wellbeing is also the cause of increasing eye diseases, scoliosis and inactivity. Not only that, when using apps or phones, the user's information is leaked due to security holes. Some people obtain this information for malicious purposes. The more and more cyberbullying phenomena happen, the more false information is posted, causing confusion for people (Chen 2016,Wong-Lo 2011,Brandon 2019, RSPH 2017). Digital wellbeing brings both positives and negatives to humans. Technology is not wrong, but technology is positive or negative based on how users interact with the technology. Based on the opinions and arguments of experts, we still believe that in the future digital wellbeing will continue to grow and bring many benefits, minimizing and overcoming negative aspects for people.

III. Trend of digital wellbeing in future

According to (Harvard, 2020), while the world has been severely affected by Coronavirus COVID-19, online healthcare solutions have risen sharply. From yoga classes to group fitness to face-to-face counseling, the healthcare market has quickly adjusted to meet demand. For example, the meditation app Headspace experienced a 19x increase in the number of users completing a calming exercise. One factor driving the demand for these services is the public's desire to boost the immune system to fight COVID-19. Human desire to connect is also driving demand, because of the overwhelming loneliness caused by social alienation. It is predicted that this online wellness trend will continue after COVID due to the benefits of in-home services.

Rapid technological advances mean cheap devices and investment focused on the health of small and large tech companies - all of which indicate a growing trend in assistive technologies. sleep by 2020. We are at a point of increasing disruption to sleep, reaching epidemic proportions. According to the Centers for Disease Control and Prevention (CDC), 1 out of every 3 adults in the US gets insufficient sleep, causing $ 411 billion in annual losses due to loss of productivity. As a result, technologies about sleep are on the rise. From smart mattresses to sleeping covers ... from sleeping tonics to CBD (cannabidiol extracted from hemp) ... from sleep monitors to robots, the sleep industry is estimated to reach $ 585 billion by year. 2024. With growing awareness of personal health and personal care, people are focusing their attention and spending on securing their lives (Relations, 2016).

Cover to (Forum, 2019), nowadays technology and science are advancing, solutions become more affordable and easier to use. That is the case with DNA testing. DNA testing has become popular due to its ability to detect disease-causing predisposition such as heart disease, cancer or neurological dysfunction. Advances in DNA sequencing technology have reduced costs and allowed direct service delivery to consumers. Therefore, people are better understood and able to make lifestyle choices tailored to their DNA traits. However, due to the complexity of such DNA test results and their implications for one's health, the consumer should still work with medical professionals to decode the results and perform these tests. an appropriate lifestyle plans.

Good health is a basic need. And now that developers are trying to get to it online, that's why investors around the world are pouring money into new digital health projects. 2020 is a year heavily influenced by COVID-19, that's why one of the growth trends of digital wellbeing is online healthcare. This is aimed at boosting the immune system to fight COVID-19. It has received a very positive response from users, for example, the meditation application Headspace has 19 times more users who complete the meditation exercise. The second trend is to create sleep technologies, to help people reduce the rate of sleep disturbances, to help people drought unwanted weight. The third trend is to apply digital wellbeing technology to DNA tests and tend to identify diseases such as cancerous cancer, heart disease, ... From the above trends, we can see that people are increasingly more interested in health. With growing awareness of personal health and personal care, people are focusing their attention and spending on

securing their lives. Along with it is the development of digital wellbeing technology to meet the needs of people, giving people a more convenient and easier life.

IV. Identify your topic (research question) in the wider context

According to (Bauer, 2020), smartphone has impacted almost all walk of human life. The prominent areas, where the impacts of smartphones are obvious to include business, education, health, and social life. Mobile technology has drastically changed the cultural norms and behavior of individuals. There has been increasing interest in the use of smartphone applications (apps) and other consumer technology in mental health care for a number of years. However, the vision of data from apps seamlessly returned to and integrated into, the electronic medical record (EMR) to assist both psychiatrists and patients has not been widely achieved, due in part to complex issues involved in the use of smartphones and other consumer technology in psychiatry. These issues include consumer technology usage, clinical utility, commercialization, and evolving consumer technology. Technological, legal, and commercial issues, as well as medical issues, will determine the role of consumer technology in psychiatry. Recommendations for a more productive direction for the use of consumer technology in psychiatry are provided.

Smartphones have become widely accepted and become an integral part of today's society, including the field of medicine. In addition to mobile communication, smartphones allow consumers to download third-party applications (apps) through an online mobile store. The Apple mobile app store and the Google Play mobile app store (Android) have more than 1.2 million apps and 1.6 million apps, and the number of apps continues increase every year. They offer users a wide range of applications with a wide range of functions to choose from. The public is increasingly interested in using apps to improve health and fitness, and as a result the number of apps focusing on these problems has grown exponentially. In 2017, It has been estimated that there are about 325,000 apps classified in the categories of health and medicine. Of these, 65% are dedicated to well-being (exercise, healthy lifestyle, control of stress, dieting, and nutrition). Those dedicated to specific diseases constitute 9% of the total, followed by those related to pregnancy (7%) and apps focused on treatment adherence or alarms to take medication (6%) (Pohl, 2018).

Since the advent of smartphones and smart apps, there has been an increase in patient assistance in many fields of medicine through the use of technology. One report found that: 90% of adult Americans

own a cell phone and more than 70% own a mobile phone with application capabilities. Among those with a mobile phone, about 20% have already used a mobile health care application (mHealth) and by the end of 2015, this number is expected to increase to 33% (DUGGAN, 2015). The number of apps for healthcare continues to grow in 2017. The supply side of the market for mobile health apps shows robust growth of 25% year-on-year but even though the growth rate of the number of health apps is still high, overall, they are slowing down: The growth rate of new mHealth app additions to the major app stores last year 57%, this year's growth rate has declined to 25% (Pohl, 2018). Smartphones continue to offer opportunities to exploit consumers, especially since 70% of adults track certain types of health metrics for themselves or their loved ones through the record on paper or other media.

Apps on smartphones can help users improve their health for a student in university. Firstly, the phone application can help improve health through functions that help users to manage sleep, manage weight, remind to take medicines, remind to drink water, etc. Cover (Gillespie, 2016), says one goal for weight loss health and fitness applications is sleep and sleep hygiene, sleep disorders are a common problem and contribute to a wide range of healthcare issues. The societal and financial costs of sleep disorders are enormous. Sleep-related disorders are often diagnosed with an overnight sleep test called a polysomnogram, or sleep study involving the measurement of brain activity through the electroencephalogram. Other parameters monitored include oxygen saturation, respiratory effort, cardiac activity (through the electrocardiogram), as well as video recording, sound, and movement activity. Monitoring can be costly and removes the patients from their normal sleeping environment, preventing repeated unbiased studies. These apps have a wide range of functions, including smartwatches, sleep aids, sleep recording, and sleep analysis. Some developers build smartphone programs to assist health care professionals in screening patients for snoring and obstructive sleep apnea. Among the applications are available and suitable advice can be given to patients about sleep application data. The purpose of this study is to review current selection of applications capable of sleep analysis and provide resources to familiarize doctors with the most commonly used sleep apps. piercing. Data collected using developer's store and website description, including app name, functionality, price, date last updated, user rating, number of user reviews User and developer information stores. Their search queries in Android Google Play, Apple iTunes, Amazon Appstore, and the Microsoft App store yielded 2,431 potentially relevant apps, of which 73 unique apps were rated by them. Of these, 78% of

the apps (57/73) are free to download, and 22% of the apps (16/73) cost upwards of $ 9.99. Self-sleep management interventions incorporate technology capable of empowering patients to improve the health and wellness outcomes of people with sleep deprivation. In this article, we agree with the point of (Gillespie, 2016), the recent increase in use of smartphones with on-board high-quality sensors has led to an increase in the number of applications. Sleep test runs on smart phone. And the smart sleep management app that users can track sleep, identify factors that cause sleep disturbances, from which these apps evaluate the user's sleep habits, track the sleep patterns of the user. their daily sleep-related behavior and feedback advice to them. However our review of existing application contexts shows that except for those applications that implement simple authentication questionnaires, most sleep tracking applications are not based on strong scientific evidence. Furthermore, apps are capable of providing very different results based on the type of phone, the type of patient and where the phone is located compared to the different user, age and object of user, and the environment the user uses. Moreover, the author has shown the role sleep plays in human health and well-being, the effects on sleep disturbance, and introduces us to applications that can improve sleep to prevent the development of unwanted diseases. However, the author only introduces but does not clearly point out at what age and who the sleep disturbances can occur. Under the pressure of exams and assignments, sleep disturbances not only in the elderly but also occur in a lot of the university student system. However, this study has not shown that sleep monitoring applications also improve student health.

According to (Hammonds, 2014), this is a study of the health and well-being of students. Application reminder of drugs via smartphone apps increases the likelihood of compliance with antidepressants in college students. The use of drugs to treat depression among college students is on the rise. Results of a nationwide survey of 320 university counseling center directors showed that 24% of customers of these centers were taking psychiatric drugs. Participants were randomly selected into a reminder or control group. Both groups were asked to complete a survey and undergo a manual pill tally at the start of the study and 30 days later. Despite the increasing use of antidepressants by college students, little is known about student compliance with antidepressants. Reasons for noncompliance with antidepressant

therapy include forgetting, ineffective medication, wanting to “fix” problems without medication, side effects, fear of dependence, and inability to buy medications . Using the medication reminder app that can improve antidepressant adherence in college students is defined as taking between 80% and 100% of the prescribed dosage. Future studies will examine factors that influence college students' antidepressant adherence in a larger sample. Overuse and illicit drug users may need special attention due to the possible side effects of chronic overdose and drug use in combination with use of antidepressants. Furthermore, the effect of automatic drug reminders on compliance must be examined over time to determine whether such interventions can induce and contribute to long-term full compliance or not. With more and more college students using smartphone technology and the wide availability of reminder apps, it can be an inexpensive intervention to improve compliance antidepressants in college students. In this article, (Hammonds, 2014) presented on the incidence of depression in college students, the dangers of depression and the reasons why rates of depression are on the rise. They found that one of the main reasons students suffer from depression is that they forget to take medication. Therefore, they are working on an application that can remind users to take their pills on time. After testing the product, the random participants got very good results. A high proportion of participants improve their health. This shows that phone apps can improve students' health and well-being. For students, there are many studies on health effects such as sleep disturbances, depression, and behavioral disorders, very few articles related to being overweight. However, being overweight and obesity are a global public health problem and are a key feature in discussions of primary and secondary health care strategies. Developed in the 1960s and now at a rapid rate, along with population aging, this problem is contributing to the increased incidence of high blood pressure and cholesterol levels, type 2

diabetes and cancer. letters. Mortality increases as levels of overweight increase, as measured by body mass index.

Cover to (Flores-Mateo, 2015), they say In 2008, 35% of adults older than 20 years were overweight (BMI ≥ 25 kg/m) and the worldwide prevalence of obesity (BMI ≥30 kg/m) had nearly doubled since 1980, from 5% of men and 8% of women to 10% and 14%, respectively [2]. An estimated 205 million men and 297 million women were obese—a total of more than half-billion adults worldwide. For these reasons, identifying effective interventions is an important component in public health efforts to curb obesity, but the most effective strategies for weight loss remain unclear. In reasearch of (Cox, 2018), they consider exercise contributes to weight loss and maintenance efforts. Consistently performing an exercise of a duration greater than the basic recommendations for health (150 min/week of moderate-intensity exercise) does appear to be more likely to contribute to weight loss and weight maintenance efforts over the long term. In addition, individual differences may play a role (responders vs. responders). Thirty-six overweight participants were assigned to either exercise plus calorie restriction or calorie restriction alone to determine whether exercise enhanced weight loss efforts. The calorie deficit remained constant during the 6-month trial. Ten percent weight loss was achieved over 6 months in both interventions without a statistically significant difference in the percentage loss of body fat. However, the exercise group had the added benefit of improved aerobic fitness. Variability in sex, BMI, exercise intensity and duration, and type of exercise in research studies make conclusive recommendations more difficult. Minimal research has been focused specifically on the weight loss effects of exercise alone in individuals with type 2 diabetes, who may have a different response to exercise than the population without diabetes. Base on (Jee, 2017), they say in recent years, there has been a rapid increase in innovative technology advances to support changes in health and fitness behavior. Moreover, a study with 28

subjects was conducted with 4 different focus groups which resulted in an average of 6 subjects per group (Vosa et al., 2016). Overall, there were a limited number of studies that utilized a large group of healthy adults as subjects and controls for the accuracy assessment of smartphone sensor-based applications for physical activity promotion. Through the two studies above found that, people can improve their weight by performing exercise exercises, physical activities regularly. Physical activity is known as a preventive measure to prevent lifestyle diseases. The smartphone applications for health and fitness interventions have released with the rapid proliferation of innovative technology. Mobile application assessments have been performed to observe the feasibility and applicability of interventions for physical activity that improve the health and weight of the person. Physical activity is known as a preventive method for preventing lifestyle diseases, and helping people control their weight, but it is not the only method of weight management. There is a lot of research on physical activity with weight control, but not much research on how to track weight by maintaining a healthy diet, diet, and daily calorie tracking. Therefore, through previous studies, with the development and impact of smartphone applications, the effect of weight on health and life. We decided to research on mobile apps to help students control their weight, improve their health by tracking their diet. This report wants to demonstrate that the application can be effective in promoting healthy eating and weight loss and that they can be a useful and low-cost intervention for improving diet and nutrition. as well as tackling obesity in the general population. Research results show that the accuracy of dietary and nutritional measurements obtained with a mobile device is generally believed to be good.

D. Review research methodologies

I. Discuss methodologies

1. Primary research

The generation of new data in order to address a specific research question, using either direct methods such as interviews, survey, or indirect methods such as observation. Data is collected specifically for the study at hand, and has not previously been interpreted by a source other than the researcher. Primary research has historically been divided into 'quantitative' and 'qualitative' methods. "These approaches can be seen as the formation of two separate" research strategy "clusters, where research strategy refers to a" general orientation to social research conduct (Bryman, 2001). However, the distinction is not always clear-cut, and some studies can share both quantitative and qualitative approach characteristics. A focus on numerical data and statistical analysis is the characteristics of quantitative methods, with an emphasis on generating objective, accurate, relevant data. A focus on language (rather than numbers) and an emphasis on the meanings and understandings of their social environment by participants are distinguished by qualitative approaches. Various ontological and epistemological assumptions, quantitative approaches associated with objectivism and positivism, and qualitative approaches associated with constructivism and interpretivism underpin the two techniques (Robson, 2000).

Primary research helps the social researcher to better collect data tailored to the particular research issue they want to answer. It can, however, be a time-consuming and expensive process, for instance, especially in large-scale survey research. In primary research, the concepts of validity and reliability were considered fundamental, the former referring to whether the findings of a study are accurate and correct and the latter to whether the results can be replicated. In quantitative research these concepts have been considered crucial, and largely focus around the idea of the accuracy of measurement; however, qualitative approaches are less concerned with precise measurement and there has been some debate about the extent to which these concepts are applicable. Some scholars have suggested that alternative principles should be applied in assessing qualitative studies, such as ‘credibility’ and ‘confirmability’. Some researchers think that the research of the net lack ecological value. Qualitative research has been criticized for being too subjective, lacking in scalability and generality. The two

research methods have different strengths and weaknesses. This report argues that a 'multi-method' approach, which incorporates aspects of both qualitative and quantitative research, could be helpful.

1.1 Interview

According to (Ryan, 2009), Interviews are widely used as a data collection tool in qualitative research. A significant data collection method involving verbal contact between the researcher and the participant is the interview. In survey designs, and in exploratory and descriptive research, interviews are widely used. There is a variety of interviewing methods, from fully unstructured in which the participant is permitted to speak openly about whatever they want, to highly structured in which the answers of the participant are restricted to answering direct questions. When performing an interview, several significant stages need to be followed. To achieve a good result, the essence of the questions, interviewing strategies, listening, and interviewer-interviewee interactions are critical. Similarly, the basic elements of interviewing are ethical considerations and the security of participants. Although interview data can be used as evidence of the attitudes and understanding of people, it is important to note that answers can be influenced by factors such as whether and how the interviewer has impacted the interviewee and the degree of confidence and relationship between the two individuals. It is also important that interviewers are aware of the different strategies underpinning the interview process to optimize outcomes.

The quality of the data obtained in an interview will depend both on the design of the interview and on the interviewer's ability. For instance, leading questions or questions that are not understood by the interviewer may require a poorly structured interview. The answers that the participant makes can be influenced consciously or unconsciously by a bad interviewer. In this case, the study outcomes would be adversely affected.

Type of interview method:

- Standardized interview
- Semi-standardized interviews
- Conduct of one-to-one interviews
- Unstandardized interview

In conclusion, interview method is suitable for this research because interviews are a versatile and useful data collection tool and are particularly suitable for the collection of information on the experiences, opinions and behaviors of participants (Gerrish K, 2006) claims that one of its biggest strengths is the versatility of the interview system. The interview makes it easier to obtain vast volumes of in-depth data, but it is important to remember that it can be an expensive and time-consuming method of gathering and analyzing data. When performing an interview, several significant stages need to be followed. To achieve a good result, the essence of the questions, interviewing strategies, listening, and interviewer-interviewee interactions are critical. Similarly, the basic elements of interviewing are ethical considerations and the security of participants.

1.2 Survey research

According to (Bjelland, 2002), survey research is defined as "the collection of information from a sample of individuals through their responses to questions". Perhaps the most commonly used and best-known method of study in the social sciences is survey research; it is undoubtedly one of the oldest methods. The use of surveys as a way of information collection can be traced back to Ancient Egypt, and in the 18th century, surveys on social conditions were conducted in England (Glock, 1967). Modern survey research dates back to the 1930s when the method was popularized by pollsters like George Gallup.

Survey research is a quantitative and qualitative method with two important characteristics. First, the variables of interest are measured using self-reports. In essence, survey researchers ask their participants (who are often called respondents in survey research) to report directly on their own thoughts, feelings, and behaviors. Second, the topic of sampling is given considerable attention. In particular, for large random samples, survey researchers have a strong preference, since they have the most reliable estimates of what is valid in the population. In fact, the only method in psychology in which random sampling is routinely used may be survey research. Beyond these two elements, in survey research, almost anything goes. Surveys can be short or long.

This form of study enables a range of methods to recruit participants, gather data, and use different instrumentation methods. Survey research may use quantitative research techniques such as numerically graded item questionnaires, qualitative research strategies as using open-ended questions, or both as a mixed methods approach. A survey consists of a collection of questions given to a sample that is

predetermined. The main purpose of this type of survey is to collect information describing the characteristics of a large number of interested individuals relatively quickly. One can define the attitudes of the population from which the sample was taken with a representative sample, that is, one that is representative of the larger population of interest. Furthermore, one may compare the attitudes of different cultures and search for shifts in attitudes over time. A good sample selection is key as it allows one to generalize the findings from the sample to the population. Survey research can use a number of methods of data collection, with questionnaires and interviews being the most common. Questionnaires can be self-administered or administered by a professional, individually or in a group can be administered, and usually contain a set of items that represent the study goals. The questionnaire can be in paper form and sent to participants, sent electronically via email or an Internet-based program like SurveyMonkey, or a combination of the two, allowing participants to choose which method priority. Another approach to data collection used in survey research is to perform interviews. Interviews may be done via mobile, screen, or in-person and have the advantage of visually recognizing the interviewee's nonverbal response(s) and being able to explain the expected query afterwards. In order to obtain more information about a question or subject, an interviewer can use questioning comments and can request clarification of an ambiguous answer (Singleton & Strait, 2009).

For example, (Maiko, 2014) identified the use of survey research in a review of the effects of oncologist communication skills training on oncologists and patient outcomes (e.g., success and trust of oncologist and patient pain, satisfaction, and confidence). A sample of 30 oncologists from two hospitals was collected, although the authors provided a power analysis that concluded a sufficient number of oncologist participants to identify differences between baseline and follow-up scores. The study's conclusions may not be generalized to a wider population of oncologists. Oncologists have been randomized either to an intervention group as training in communication skills or to a control group as no training. Self-report numerical ratings were used to assess belief, satisfaction, and trust of the oncologist and patient distress. The trust of oncologists was measured using two instruments using 10-point Likert rating scales each. In a variety of populations, including people with cancer, the Hospital Anxiety and Depression Scale (HADS) has been used to assess patient distress and has shown validity and reliability (Bjelland, Dahl, Haug, & Neckelmann, 2002). Using 0 to 10 numerical rating scales, patient satisfaction and confidence were assessed.

In summary, survey method is very suitable for this research project, because of this type of research. Because this method can collect data based on a series of different methods. Survey research can use quantitative research techniques such as questionnaires to classify by arithmetic results, tables. Questionnaires can be in paper form and sent to students, emailed electronically or an Internet-based program such as Form Drive, or a combination of the two, allowing participants to choose a convenient and convenient method. unify. Moreover, this method can also use qualitative method techniques such as open-ended questions. Or even both methods combine. Another approach to data collection used in survey research is conducting interviews. Interviews can be done via mobile, screen or in person and have the advantage of visually recognizing the interviewee's non-verbal response (s) and being able to explain the planned question. After that. Furthermore, the main purpose of this type of survey is to collect specification information of a large number of individuals, which is very well suited to the project. We need to collect a large amount of information and feedback from students after using the application to help manage weight quickly. When in the survey method, when using the questionnaires to save time, the number of data is being normal under the form table and map map to easy parsing, the data were assessed in a more objective and accurate manner. In the tables we select open-ended questions, to collect user behavior regardless of the available answers. This is versatile and useful data collection tool and are particularly suitable for the collection of information on the experiences, opinions and behaviors of participants.

1.3 Observation

According to (Dennis, 2014), observation, the act of watching processes being performed, is a powerful tool to gain insight into the as-is system. Observation enables the analyst to see the reality of a situation, rather than listening to others describe it in interviews or JAD sessions. Several research studies have shown that many managers really do not remember how they work and how they allocate their time.

Advantage and disadvantage of observation:

Advantage	Disadvantage
Extremely authentic engineering tool specifications,	It could be in violation of the formal principles of organization.
In their behavior, they appear to be more highly cautious.	High cost to travelling.
Observations are used mainly to confirm requests and check them.	It may take time to analyze.

Table 1: Advantage and disadvantage of observation

2. Philosophical/theoretical frameworks

2.1 Waterfall Model

According to (Denis, 2014), the Waterfall model is an instance of the Sequential model in the life cycle of software growth. The project team proceeds sequentially from one step to the next with waterfall creation.

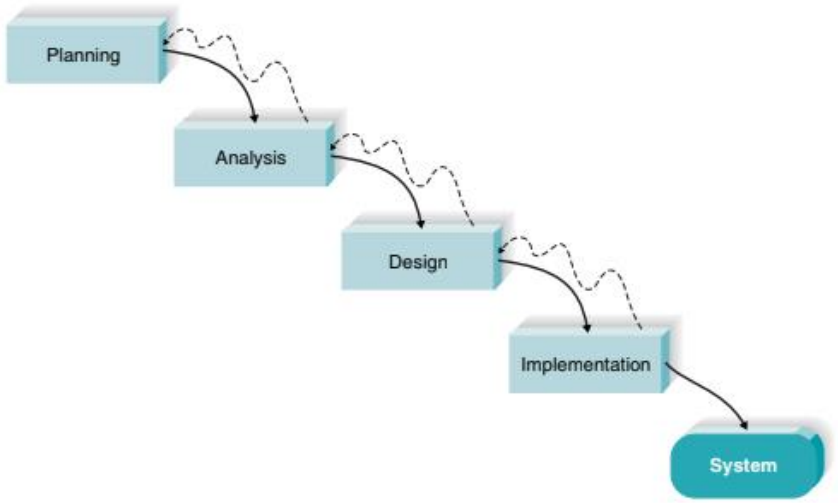


Figure 3: Waterfall Model

The process ends until the work generated in one stage is approved, and the next phase begins. It moves forward in the same way as a waterfall as the project progresses from phase to phase. It is difficult to do, although it is possible to go back to phases.

- **Advantages and disadvantages of Waterfall Model**

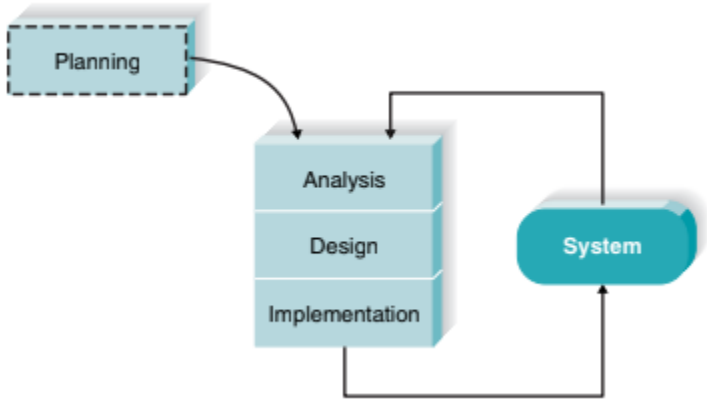
Waterfall development methodologies have several advantages and disadvantage following below table:

Advantages	Disadvantages
Each phase must be completed before the next development stage.	The error can only be corrected during the stage .
Suitable for smaller projects where there are well-defined specifications.	For a complex project where requirements often change, it is not desirable.
Before completing every stage, they should perform a quality assurance test (Verification and Validation).	In the developmental phase, testing time comes very late.
Elaborate documentation is done at every phase of the software's development cycle	For developers and testers, documentation takes a lot of time.
The project depends entirely on the project team, with minimum customer intervention.	The ongoing development phase does not include customer feedback.
Any changes in software are made during the process of the development.	There can be a lot of issues with minor adjustments or bugs that occur in the completed program.

Table 2: Advantages and disadvantages of Waterfall Model

2.2 Agile Model

According to (Denis, 2014), Agile development is a community of programming-centric methodologies that concentrate on streamlining the SDLC. A project emphasizes quick, iterative creation of applications in which every iteration is a full project of software, including preparation, review of specifications,



design , coding , testing, and documentation.

Popular Agile models:

– XP: extreme programming

– Scrum

– DSDM: dynamic systems development method

Figure 4: Agile Model:

- **Advantage and Disadvantage of Agile Model**

Agile Model have several advantages and disadvantage following below table:

Advantage	Disadvantage
A good model for slowly evolving conditions.	Not suitable for handling complex dependencies. More risk of sustainability, maintainability and extensibility.
Small to medium-sized ventures are traditionally appropriate.	Requires significant changes to development practices (may not be well received!)
Focus on satisfaction with users and teamwork. Promotes cross-training and teamwork.	Requires team members with relatively high skill level
It is possible to quickly create features and demonstrate it.	Maintenance may be difficult due to reduced documentation
Allows simultaneous production and distribution within an overall scheduled context.	Transfer of technology to new team members may be quite challenging due to a lack of documentation.
There was little to no preparation required. Simple to administer.	It depends heavily on customer interaction, so if a customer is not clear, the team can be driven in the

	wrong direction
It gives flexibility to developers.	

Table 3:Advantages and disadvantage of agile model:

2.3 Justify software model

This report presents several reasons for choosing a waterfall model for the project. First, the waterfall model is used for projects where requirements and procedures can be precise from the planning stage and where the assumptions will only change slightly during the process. of project. In addition, the waterfall model provides a clear organizational structure for development projects, in which the individual project implementation phases are clearly separated from each other. When each phase ends with a milestone, the development process is easy to follow without having to worry about changes during the project's implementation. The model focuses on documentation of process steps. Therefore, the acquired knowledge is recorded in the required documents or drafts. According to Royce, the results of each phase of a project should be immediately compared and verified with previously prepared documents - for example, after developing a module, it is necessary to ensure that it is meet previously defined requirements, not just at the end of the development process. As a result, all project execution is recorded and compared with pre-prepared documents, developers can easily track the entire project implementation and make reviews. See whether the project is working to meet a need or progress. Then give directions, determine directions to solve or promote the implementation of the project on schedule. While models like spiral or V-pattern are considered further evolution of the classical waterfall model, concepts like extreme programming, flexible software development, or iterative prototyping have Completely different approach and often allows more flexibility in adapting to existing changes and new requirements. Second, due to the strict linear sequence of successive project phases, the waterfall model is suitable - if any - for small software projects only, suitable for our project. However, it can handle complex systems without difficulty with unfamiliar technology. Finally, because the waterfall model enforces a consistent discipline to ensure its reliability and reliability are considered risky. Especially not limited to time, the company does not limit the short time to implement the project.

3. Review similar product

3.1 Lose It!

According to (Elliott, 2020), Lose that! The weight loss software is user-friendly and focuses on calorie counting and weight monitoring. Lose It! through an analysis of your goals for weight, age, and health. It establishes your daily calorie requirements and a customized plan for weight loss. Lose It! through an overview of your goals for weight, age, and fitness. It establishes your daily calorie requirements and a customized plan for weight loss. You can easily log your food intake into the app, which draws from a vast database of over 33 million foods, restaurant products, and brands, once your plan is created. In addition, you can use the barcode scanner of the app to add some foods to the log. This saves frequently entered foods, so you can select them quickly from a list whenever you eat. You'll also get daily and weekly calorie intake reports. If you use the app to keep track of your weight, your weight changes on a graph will be presented.

One characteristic that makes Lose It! It has a Snap It feature, which enables you to track your food intake and portion sizes simply by taking pictures of your meals, unlike many other weight loss apps.

Pros of Application

- Lose that! It has a team of experts in its database who check foods' nutrition knowledge.
- You can sync the app with other weight loss and fitness apps, including Apple Health and Google Fit.

Negatives of Application

- Lose that! The vitamins and minerals that you eat do not keep track, but they explain why.
- There are some famous brands absent from the food database that you would expect to find elsewhere.

3.2 Fitbit

According to (Elliott, 2020), by keeping track of your fitness habits with a wearable activity tracker (6Trusted Source, 7Trusted Source, 8Trusted Source), one possible way to shed pounds is. Wearable devices that monitor the level of activity during the day are Fitbits. They're an excellent resource to help you track physical activity. The Fitbit will monitor the number of steps taken, miles walked, and stairs.

The Fitbit also tracks the heart rate. Using Fitbit gives you access to the Fitbit app, where all the information about your physical activity is synced. You can also keep track of your food and water intake, sleep habits, and weight goals. Fitbit also has good community functionality. You can communicate with your friends and family who use Fitbit via the app. With them, you can take part in different challenges and share your progress if you choose. Additionally, whenever you achieve a particular goal, you receive awards. For example, if you walk 990 lifetime miles, you will earn the "New Zealand Award," meaning that you have walked the entire length of New Zealand. You can also log your calories with the Fitbit app so you can stay within your calorie range and your water consumption so you can stay hydrated.

Pros of application

- In order to keep a close track of your weight and fitness goals, Fitbit gives you a vast amount of data regarding your activity levels.
- The app is very easy to use and has many ways to show you your progress and keep you inspired.

Negatives of application

- While users can use the app without a Fitbit unit, you must own a Fitbit in order to use the app's workout, sleep, and heart rate components. There are many kinds, and some are costly.

3.3 SparkPeople

According to (Elliott, 2020), SparkPeople helps you, with their user-friendly monitoring tools, to monitor your daily meals, weight, and exercise. The nutrition database, which contains over 2 million foods, is huge. A barcode scanner is included in the app , making it simple to keep track of any packaged foods you eat. You gain access to their workout demo part when you sign up for SparkPeople. This includes photos and descriptions of many common exercises, so that during your workouts you can ensure that you use proper techniques. There's even a scheme of points built into SparkPeople. You will receive "points" as you record your habits and achieve your objectives, which can boost your motivation. Downloading the software is free. $4.99 per month is the premium upgrade.

Pros of application

- The app offers access to plenty of videos and tips for exercise.

- In addition to an engaging online community, those who use the app have access to health and wellness posts from SparkPeople.

Negatives of application

- A considerable amount of information is generated by the SparkPeople app, which can be difficult to sort through.

E. Analyses the result of the primary research

To demonstrate the influence of technology applications on user self-monitoring of weight. We put the MyFitnessPal app - a user self-weight management app into use within two weeks. We submitted the app to 30 participants. After using it for two weeks, we will conduct interviews, surveys, and observation to demonstrate the effectiveness of the weight management application on the process of self-monitoring and improving people's health use.

Some points of the report:

- The MyfitnessPal weight management app accurately calculates the number of calories a user consumes every day based on the food they consume.
- Weight management app helps users to build healthy eating habits.
- Build for users the habit of combining healthy eating and daily exercise to burn excess calories.
- Helping users to be aware of the effects of weight on health, and self-consciously learn about nutritional information.
- Promoting self-weight is a healthy lifestyle.

I. Interview

After using the app, we conducted direct interviews with users about the impact of the app on users' self-tracking. Then give conclusions to the research:

Introduction	**Hi, we are part of a project studying the effects of the weight management app, namely the MyFitnessPal app. We have provided an application for you to participate in product research. Now we need to interview some issues to collect information to support the proposed hypotheses. We guarantee that the information you provide will be kept safe. Will you participate in the interview?**
Interviewee	We agree to participate in the interview.
Interviewer	Can you tell us about the situation you know about the application?
Interviewee	I learned about an application by a friend who recommended an application to check the impact of a weight management application on self-monitoring weight mode.
Interviewer	During the past two weeks, how often have you used the product?
Interviewee	For the past two weeks, I've been using the app every day. I spend a lot of time on the application, besides using the application for weight management I also spend a part of my time researching how to use the application most effectively.
Interviewer	Have you used all of the functionality of the application?
Interviewee	I was given an account that has unlocked all the functionality of the app. I have more chances to experience applications. I used all the functionality of the MyFitnessPal app.
Interviewer	Can you tell us what the functions of the MyFitnessPal app provide what for you?
Interviewee	I use Blog, Dairy and Plan functions every day. I am very impressed with these three functions. As for the Blog function, here is a compilation of short videos that help us burn calories. Sometimes when the food I eat exceeds the standard calorie count, these short exercises help me balance the calories I consume and burn. Not only

	that, but there are short articles that summarize daily eating routines. I can sum it up every day easily. But health advice coming from expert way is also posted here. I think this is an interesting function. Besides, I am impressed with the dariy function, every day the application asks me to provide information for each meal such as: what breakfast for breakfast, how many grams to eat. It then calculates the calories that I have consumed. Since then, I know exactly how many calories I have consumed, then have the right exercise regimen. The third function is the Plan function, which provides me with the eating method and the eating route. How should I put it, like I have a need to lose weight. At function there will be a Weight Loss Plan for me, it lasts 1 month, providing me with daily diet. I am on this diet, but I am working on it. But not enough 1 month schedule, but I see the effect immediately. It shows very clearly on my weight. I see the Plan function, like a healthy living guidebook. I can use it to improve my habits Well, besides, I think using the Nutrition function, all my nutritional information is listed in charts and tables. It shows, what substances should I supplement and what nutrient restrictions I should limit. Before I only knew this information at nutrition centers or hospitals. It saves me that time, and money. I have to spend $ 100 to do a thorough examination. But now everything is being counted up very regularly every day, this amount of money I saved to handle other problems. Actually, you think this is a small expense, right, but this is the cost of one visit. There are many more visits, a year this will be a huge expense.
Interviewer	So which of these functions do you like most? Or which function is best for you?
Interviewee	This question is difficult for me. All functions bring me certain benefits of its own. I cannot judge which function is best. I both love it.
Interviewer	So, another question, can you tell me what benefits the app has brought you to change?
Interviewee	Many benefits. But this benefit is the change in my behavior and eating habits. I change that a lot. Overall, the app gives me an accurate calculator for the number of calories I consume per day. Give me a guide on eating routines to improve my

	health, help me change my behavior, build an exercise plan to balance calories, improve health, promote the process of tracking your own weight. Also help me save costs on medical examination and treatment.
Interviewer	You say, the MyFitnessPal app acts as a calorie calculator, and helps you change your behavior. Can you talk more about this?
Interviewee	I am a student and eat and drink most of the time. To be exact, I eat whatever I feel like. This is probably the main reason why I lose control of my weight. And more importantly, I don't know how many calories I consume per day. But for now, I just need to enter the name of the formula, enter its mass, the application will calculate and supply its calories immediately. Everything is displayed on the screen; I just need to look at it to know how many calories of this product are. Also calculated to add up all the calories that I provide to compare with the standard and give excess calories. Before I woke up, I started eating breakfast with a hamburger, it was really delicious. But when I used the app later on, my light breakfast was 800 calories. For lunch I will eat fried chicken, or noodles. For example, a serving of fried chicken in Lotteria, a piece of chicken is nearly 300 calories, not to mention snacks such as drinks, chips, and fast food. One meal alone is about 1000 calories. Since I have to study until dinner, sometimes I have dinner similar to lunch. During my time working and studying, I often eat snacks such as soft drinks, snacks and chips, which are around 600 calories. So my typical day consumes about 3000 calories. You know that recommended calorie consumption for a person like me is only about 1650 - 2200 calories only. I consume in excess of 1000 calories per day. When using the dairy function of the app, I first know the exact number of calories I consume, and the excess calories per day. Then combined with the Blog function, I have a quick workout regimen to burn off excess calories. Then the Plan app gives me a guide to healthy eating, what should I eat in the morning, and what to eat for lunch. Nutrition function, in conclusion, I lacked anything, need to eat more to balance the amount of nutrients. You may not believe me, for example today. My breakfast right now is Banana and chocolate chip and oatmeal. It's easy to do and only takes 220 calories. My simple

	lunch consists of 170g chicken breast, 85g broccoli, 85g brown rice. This lunch consumes 419g of calories. Dinner is 170g beef, 1 sweet potato, 1 smoked beef cheese, 15 sticks of asparagus, 85g carrots, 2 tablespoons olive oil. The total calorie consumption for dinner is 667 calories. For lunch I have 1 bag of Quest sour cream and cheddar protein chips / 2 slices of black bread, 1 scoop of Whey Protein powder, 1 medium orange, the calories are 467 calories. The total number of calories I consume today is 1773 calories. It is a figure suitable for an ordinary person like me. You see, instead of fast food, I go on a diet high in green vegetables, fruits, and fresh food. This is an eating route I provided on that Plan function; I feel this is a great combination of the functionality in the app. Also, my behavior is much more positive. I began to study the effects of weight on health, to learn ways to improve my health. Learning nutritional information every time I eat, it makes my life much healthier than before.
Interviewer	What about building a practice plan?
Interviewee	The average amount of calories I consume per day ranges from 1500 - 1800 calories, but there are days when I have unexpected events that I can still consume excess calories. That's why I built myself an exercise routine, to improve my health and also to burn calories every day. If I don't have time, I do the short exercises provided on the Blog function, otherwise I will take the time to walk and jog to burn calories. Every day I give myself 30 minutes to practice. This is a good new habit, isn't it?
Interviewer	I am very glad that you have positive improvements in the process of using the application. Your information reinforces our opinion on the positive effects of the MyFitnessPal app on self-monitoring and weight management. Thank you for your participation in the interview.

II. Survey

1. Group of introductory questions

First, we proceed to collect information about the user who has used the product. The introductory questionnaire includes 4 questions about personal information such as username, gender, university attending, and email contact.

The results obtained 30 responses from 30 different subjects. To ensure differentiation, the interviewers were students from different schools in Hanoi such as Greenwich University Vietnam, Foreign Trade University, Polytechnic University, etc.

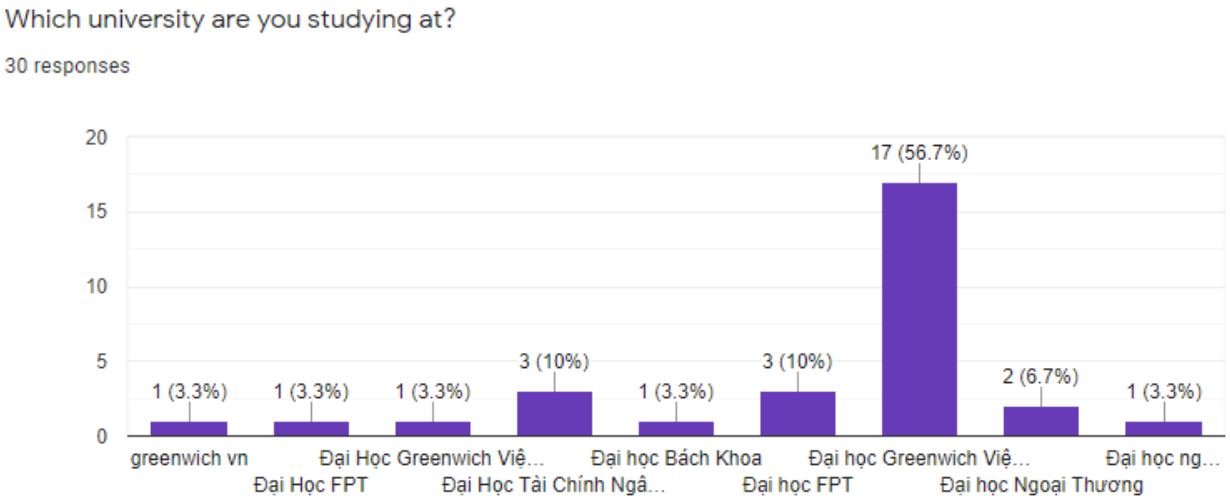


Figure 5: Group of introductory questions 1

The participants using the app were 70% male and 30% female. This shows that whether male or female, users have the need to track and manage their weight.

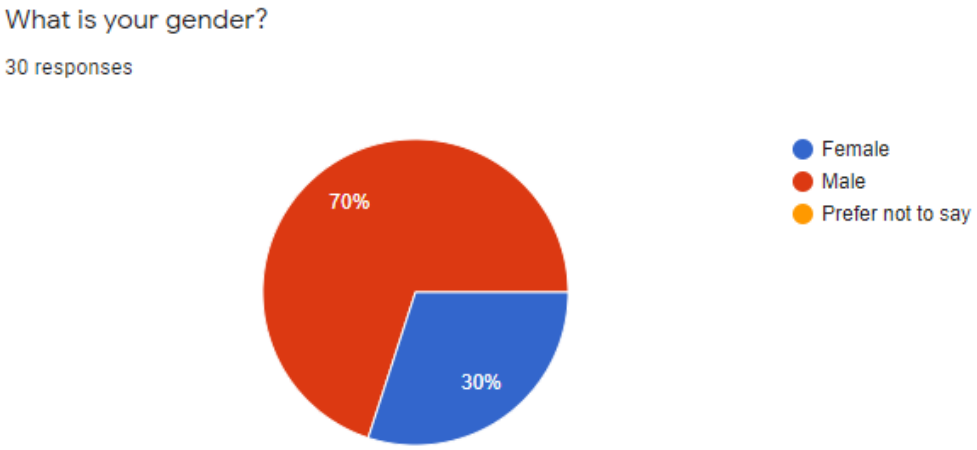


Figure 6: Group of introductory questions 2

I am very glad that you have positive improvements in the process of using the application. Your information reinforces our opinion on the positive effects of the MyFitnessPal app on self-monitoring and weight management. Thank you for your participation in the interview.

2. Group of research questions

In the survey we provide 12 research questions that focus on user behavior and application functionality. The collected data will be safe for the user, which we collect and analyze to make conclusions about the impact of our weight management application on health. health and psychology of the user.

Question 1: Before using the application, do you often find out nutrition information about daily food?

- Yes, I check nutritional ingredients every meal, I think that nutritional composition is very important to my health.
- I do look for nutritional ingredient's information, but not often because I don't have time for daily research.
- No, I eat everything I feel good. I don't care what it is made of, what ingredients it is.
- Other:

This question is aimed at understanding the user's habits before using the app. User can choose from 1 of 4 options, including 3 options available and 1 user-supplied option.

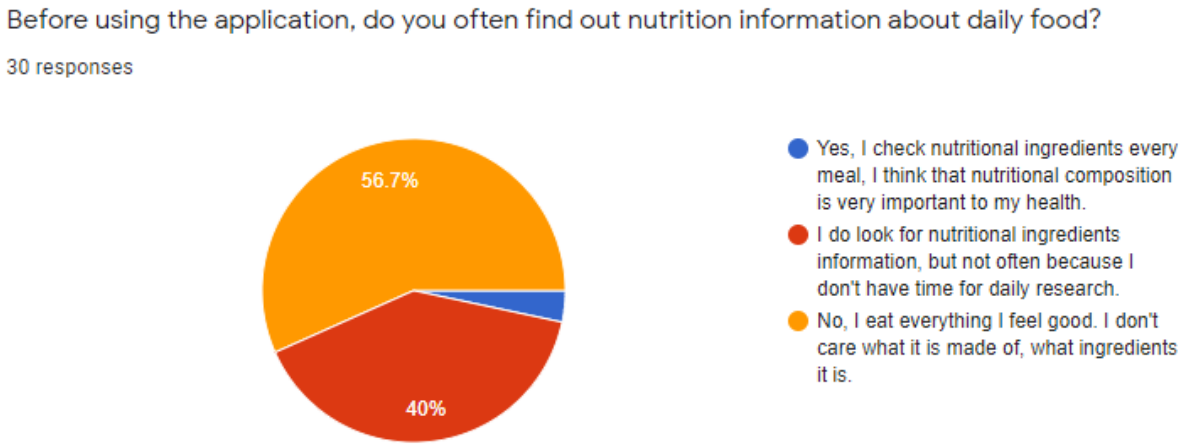


Figure 7: Group of research questions 1

The survey results of this question have 56.7% of the survey participants choose the third option, they think that they eat everything they find delicious and they do not care what they eat, nutrition information of How it is good and affects the health or not. In addition, 40% of users choose Option 2 that they sometimes do research on nutritional information, but they are very busy and do not have time to learn about nutritional information for each meal. Very few users choose option 1 as they check the nutritional information of each meal and they think that nutrients are very important and it directly affects the user's weight and health. From the above results showing the participants' behavior before using the product, the majority of students did not care about the nutritional composition of what they ate each day. This comes from many reasons, because students are quite busy so they do not have time to keep track of their meals, another is that they eat what they feel good and they do not care. The portion of these foods is like, how many calories it contains, and how it affects weight.

Question 2: Before using the application, how many calories do you consume per day?

- 1000 calories
- 1000 - 1800 calories
- 1800 calories
- I don't know.

Follow-up question to collect information about the daily calorie content the consumer consumes. Most foods have calorie information for the product, you can calculate your daily consumption. This question includes 4 options for users.

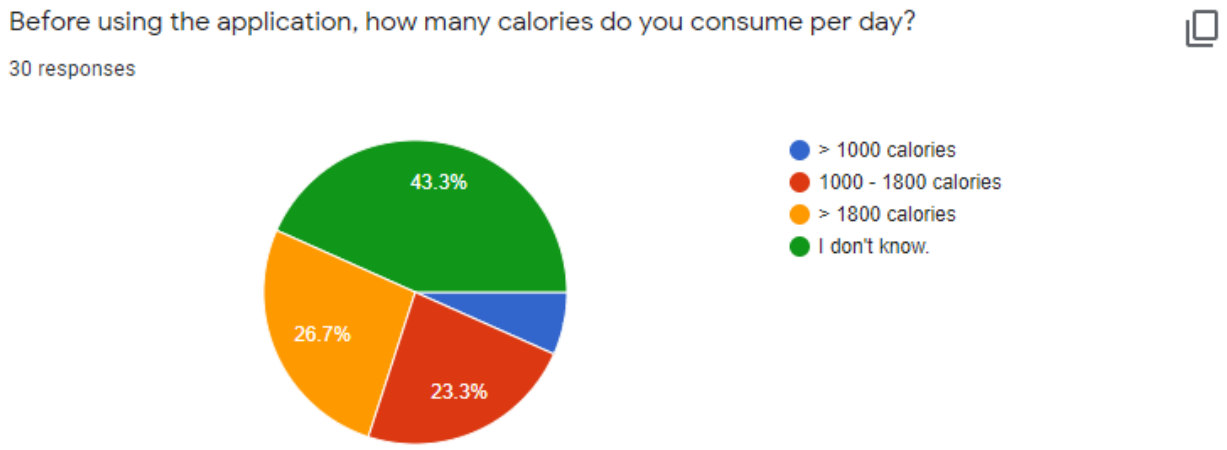


Figure 8: Group of research questions 2

The results showed that 43.3% of users chose option 4, they said that they do not know how many calories they consume one day. 23.3% of participants choose option 2, they think that they consume about 1200 - 1800 calories a day, this is the standard and most common calorie. 26.7% of users said that they consume more than 2000 calories per day. There are very few participants who claim that they consume less than 1000 calories per day. Based on this result, we see that the participants do not know how many calories they consume per day, which may stem from the participants' daily eating habits, they eat all of them. What they like there is no standard for eating, calories fluctuate from day to day. The second group was the group of consumers consuming more than 2,000 calories per day, which exceeded the standard intake for women and men. Consuming large calories can lead to weight gain and difficulty controlling weight. Only 23.3% of the participants are on a diet with a reasonable caloric consumption of between 1200 and 1800 calories.

Question 3: How often do you use the MyFitnessPal app?

- I use the app every day.
- I use the app every week.
- I use the app every month.

- I use the product very rarely.

This question is intended to survey user frequency of users who use the application. This question is quite important, in order to see if the user change is caused by the impact of application usage.

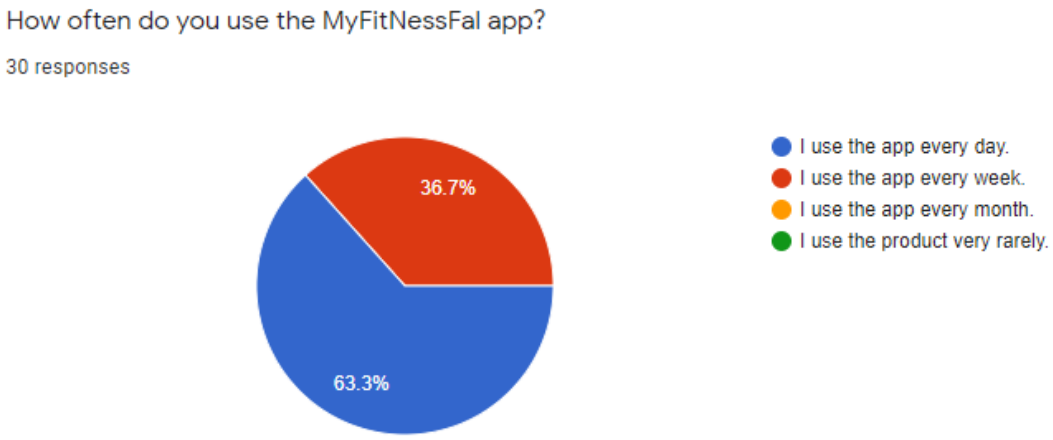


Figure 9: Group of research questions 3

From the above results, about 63.3% of users say that they use the app every day. And 36.7% of users showed that they use the MyFitnessPal app. Because the app was used by the participants for 2 weeks, since the results above show that the majority of users use the app every day, the change in user behavior may be due to the impact of usage application.

Question 4: What are you using the application for?

- Lose weight
- Maintain weight.
- Gain weight.
- Nothing.

This question examines the user what is the user's intended use when using the application. This question provides 4 options for users corresponding to each user's purpose such as weight loss, weight gain, weight maintenance and not for any purpose.

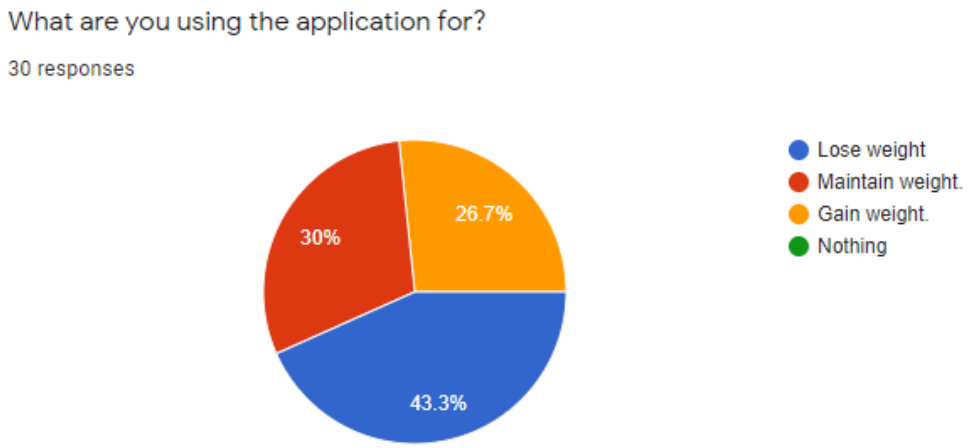


Figure 10: Group of research questions 4

The results showed that 43.3% of the participants showed that the user used the app to lose weight. 30% of users show that they use an app to maintain their current weight. 26.7% of users say that they use the app for the purpose of gaining weight. From this result, it shows that all participants using the product have a certain goal, no users think using without reason. Users define themselves a goal when using MyFitnessPal, which is also one of the information to provide when you use the application.

Question 5: What exactly are the application benefits?

- Build a personalized guide on your journey to improve your health.
- This saves you time and makes tracking easier the more you do it.
- Build the habit at my own pace.
- Learn how to modify my behavior.
- Help maintain you weigh loss.
- Accurately calculate calories per day for meals.
- Learn how exercise and food impacts my daily calories goal.
- Other:

This question is intended to investigate in the course of using the product, what benefits does the product bring to the user. The question presents 8 options for the user, including 7 options provided and one that the user can provide. Survey participants have the right to choose many options for their answers.

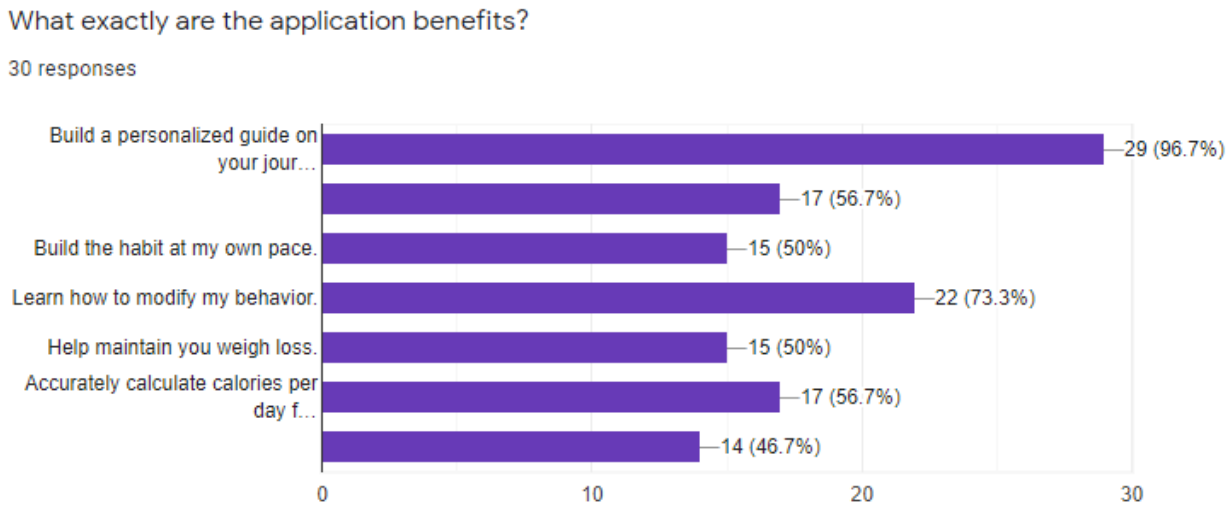


Figure 11: Group of research questions 5

From the above statistics shows, 96.7% of users believe that the application has built for users a eating route aimed at improving users' health. 56.7% of users indicate that using the app saves them time, and makes it easier to track their weight. And 50% of users can build habits and behaviors at their own pace. 73.3% of participants think that when using the app builds users ways to change their behavior more positively. Besides, 50% of users show that they can improve weight, gain weight and lose weight. Moreover, 56.7% of users think that the application can accurately calculate calories for each meal. Finally, 46.7% of users can learn how to exercise to consume calories, and the effect of food on daily calorie intake. These are positive results for the survey side, all the participants answered that MyFitnessPal. Most users think the app offers them any benefit.

Question 6: How has your behavior changed after using the app?

- I am aware of the impact my weight has on my health and have plan eat healthier.
- Actively learn about nutrition information every time you eat, and check out nutrition blogs.
- I regularly exercise for 30 minutes to 1 hour a day to balance the calories I consume.
- Other:

This question is intended to survey users. After using the application, what functions do they find most satisfied with? For casual accounts, the app offers a number of functions, such as a blog, to provide brief instructions on how to burn calories according to certain exercises or eating.

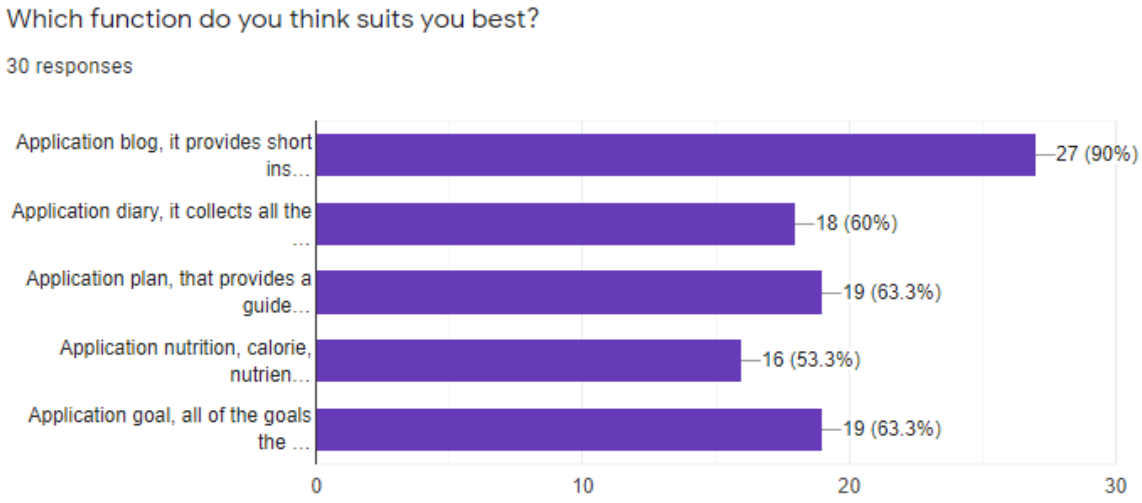


Figure 12: Group of research questions 6

The application provides many functions for users, to experience and give an objective view of each product function. Based on the above results, 90% of the participants think that the most likely function they need is a blog, this function is short articles, video tutorials to help us burn calories, provides calendars. The most commonly used diet regimen. Besides that, 60% of users reported that the dairy function was most suitable. Because this function collects the daily intake of food, then, based on the application library, calculates the corresponding calories. From this function you know exactly how many calories you consume per day. The third function is a plan, this function is the concretization of the first function. Here the application provides a list of suitable diets lasting for several weeks or months for users for each purpose such as gaining weight, keeping weight and losing weight. There are 60.3% of users think that this is a Plan function and provide functions suitable for them. The fourth function is Nutrition, which records all of the nutrition and calorie information you provide to the application. This information will be listed in the form of tables, diagrams for easy observation and conclusion. 53% of users love this function because of its convenience and accuracy. The last function is Goal, which collects the user's current information and the user's desired information, gives the user a parameter about the number of calories the user needs each day and compares it with the number of calories that the user consumes, then suggests small instructions from the plan function to the user to help the user balance the number of calories consumed each day. From the above results, the functions of the application are

all used by users for their own purposes. In other words, the functions of the MyfitnessFal app meet the user's self-monitoring needs.

Question 7: How has your behavior changed after using the app?

- I am aware of the impact my weight has on my health and have plan eat healthier.
- Actively learn about nutrition information every time you eat, and check out nutrition blogs.
- I regularly exercise for 30 minutes to 1 hour a day to balance the calories I consume.
- Other:

This question focuses on the user's behavior after using the app, what have they changed or improved upon. The question has 4 options for the answer, of which 3 questions are optional and 1 question is user can fill in information by themselves.

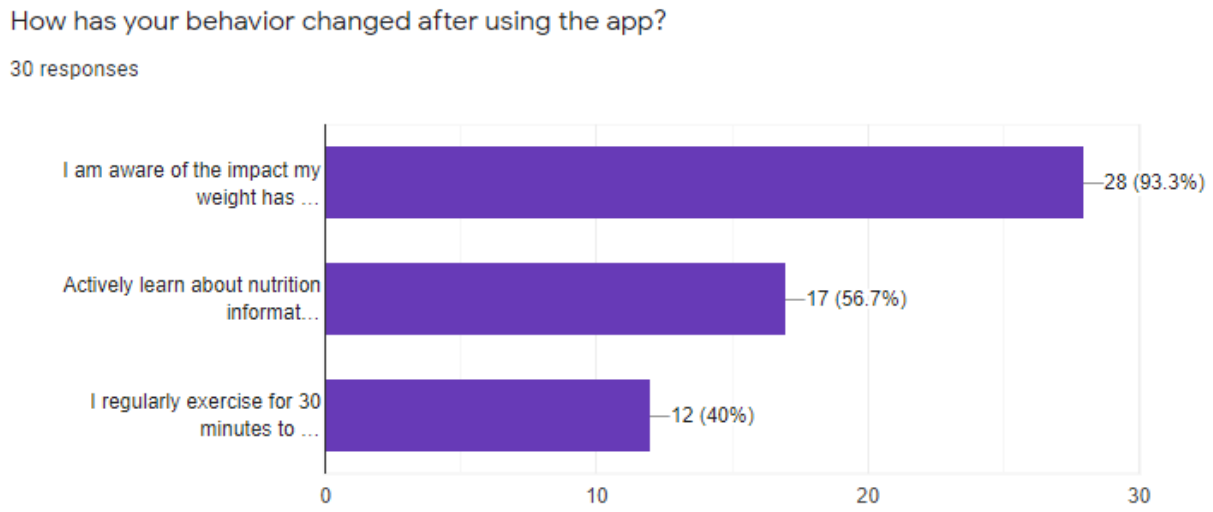


Figure 13: Group of research questions 7

From the picture above it can be seen that 93.3% of the participants realized that they were aware of the impact of their weight on their health, and they developed a more affordable and healthy diet. that. 57% of users said that since using the product, they have actively learned more nutritional information than before. 40% of users said that after using the application they have formed a daily exercise routine. This is a good result for the researcher, because all participants said that users have enjoyed positive improvements when using the app. Here we will analyze questions showing how users made more specific improvements.

Question 8: How have your eating habits changed?

- I eat a lot healthier; I eat more vegetables, fruits and fresh foods.
- I limit eating a lot of high-calorie foods.
- Limit eating instant food, junk food.
- I do not change after using the product.
- Other:

From the previous questions, we think that users have changed their behavior in a more positive way. We pose this question to solve the problem, how users have changed their eating behavior. The question presents 4 options for the user, and an option for the user to enter information.

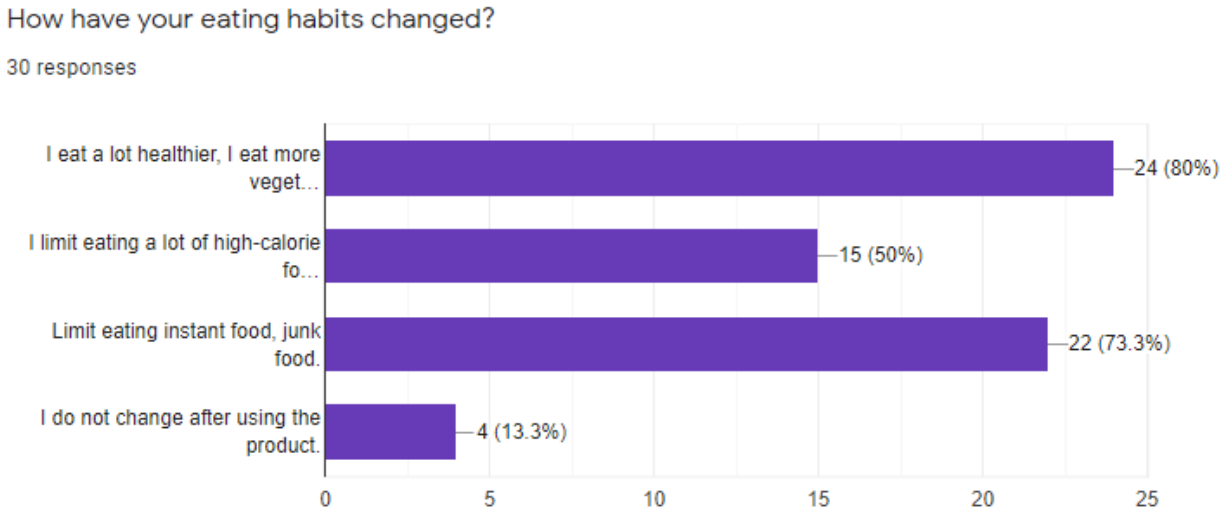


Figure 14: Group of research questions 8

There are 80% of users show that they eat healthier, it is shared that in the composition, they eat more fresh vegetables, fruits and foods. 50% say that when calorie counting, they limit their intake of high-calorie foods and replace them with other low-calorie, healthy foods. 73.3% of users indicate that they limit eating fast food. This is clearly seen in students, who often eat fast food to save time. But they do not know that fast food is not really good for their health. Still, 13.3% of the users showed that they didn't change anything. From the above results show that, users have built their own diet to balance calories in their way. Although only using the application for two weeks, but this is a good sign, users

have more positive behavior changes in their eating habits such as changing dietary ingredients, limiting foods with calories. Eat high, fast food, actively eat vegetables, fruits and fresh food. These comments can support our hypothesis that users, after using the app, have healthier eating habits.

Question 9: Do you often learn about nutrition information at each meal?

- I looked at the nutritional profiles of my daily meals. I use the Blog and Diary feature in the app to learn sensible eating routes.
- I occasionally research the calories of each product to see if they are right for my health.
- I don't get any nutrition information, I eat whatever I like.
- Other:

We have asked users a question similar to this question before using the application. This question is intended to compare user changes before and after using the application. This question gives the user 4 quick options and 1 option to provide personal ideas.

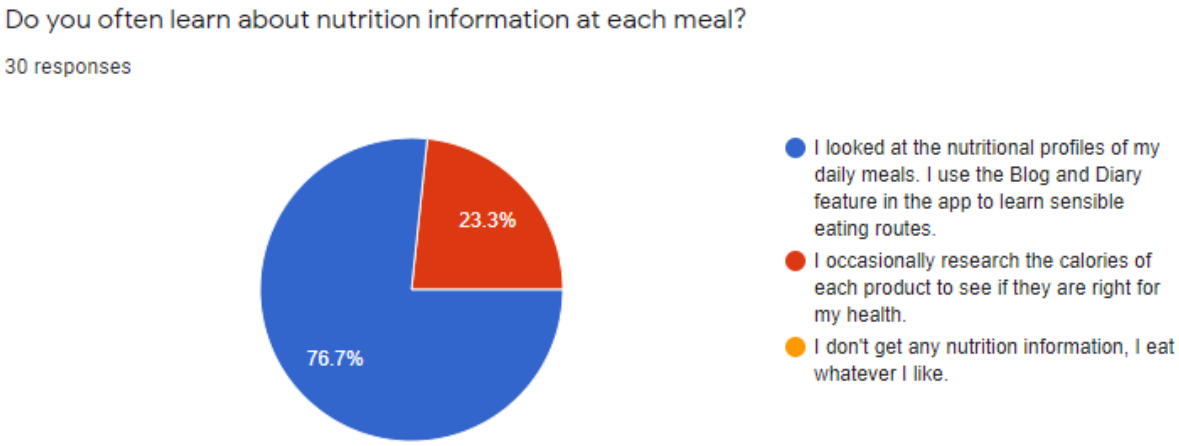


Figure 15: Group of research questions 9

The table above is the statistics of the responses of the participants. 76.7% of users said that they review the nutritional information of food before eating. They view this information directly from the Blog and Dairy functions of the app. 23.3% of users say that they occasionally do research on food information to find products that match their health. This question is to get data to prove the hypothesis, MyFitnessPal application helps users to be aware of the importance of weight to health, motivating users to learn nutritional information, formulate yourself a diet to protect your health.

Question 10: Now, how many calories you consume per day?

- 1000 calories
- 1000 - 1300 calories
- 1300 calories
- I don't know.

We wonder, after using the app, how do users change their eating habits and behavior before they eat, so how does this actually help them change their calories. This question we take stock of the average number of calories consumed per day.

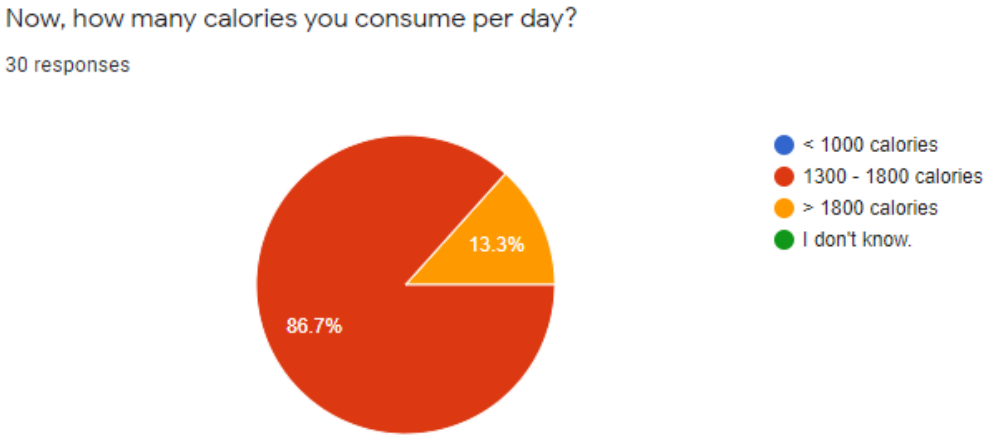


Figure 16: Group of research questions 10

The results we obtained are very concise, with 86.7% of users saying that they consume between 1300-1800 calories per day, which is the right number of calories for women and men. On average, for women, the daily calorie intake is about 1300 calories, while for men it is about 1650 calories. Therefore, these numbers show that the user is having a reasonable caloric consumption by standard. Besides that, 13.3% of users consume over 1800 calories per day. No user does not know exactly how many calories they consume per day. From the above results, it can be seen that, for the calculation provided by the application, users know the calories they consume, thereby helping users know they have set but the eating criteria are more suitable.

Question 11: What do you do to burn the calories you consume each day?

- I spend 30 minutes to 1 hour practicing the exercises.

- I walk every day to burn the calories I consume.
- I drink plenty of water, drink black tea, don't skip breakfast to burn calories.
- I don't do any practice.
- Other:

In addition to diet, to burn excess calories, participants should apply a reasonable exercise regimen. The question offers 4 choice answers and 1 answer if the user wants to provide it for themselves. Below are the statistics of the results of this answer.

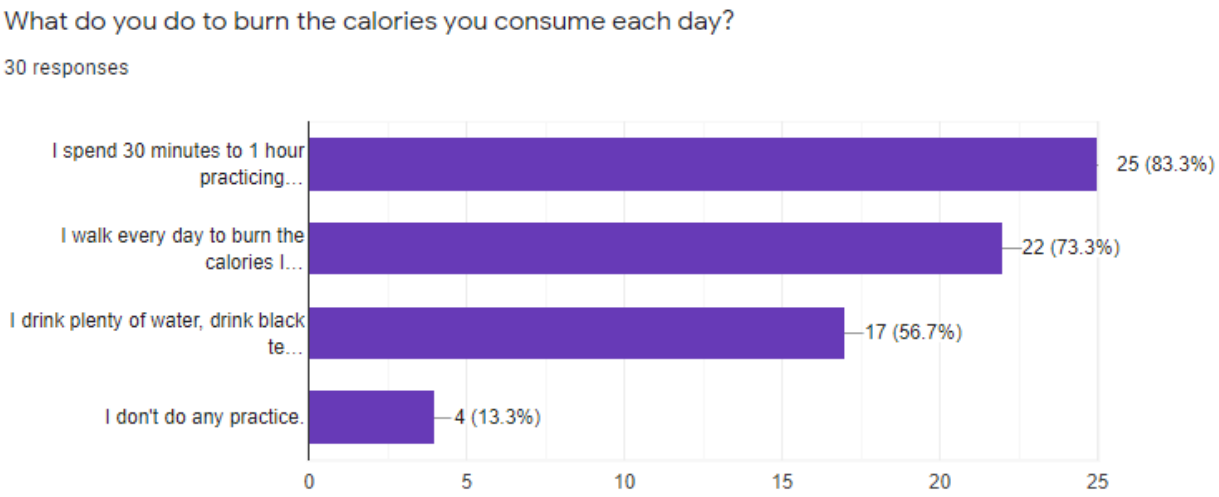


Figure 17: Group of research questions 11

From the picture above, 83.3% of users burn calories by spending 30 minutes to 1-hour practicing exercise to burn calories and balance calorie intake and burning. 73.3% of users choose simple ways like walking every day to burn the calories they consume. 56.7% of users drink water and black tea, which is also a simple way without wasting time to burn the calories consumed by participants. However, 13.3% of people still use it, they don't practice. The number of calories we consume every day is different, so we need to develop a plan for ourselves to burn calories each day. This training both strengthens your health, and also helps you burn the extra calories you consume.

Question 12: After a week of using the app, how does your weight change?

- I lost 1 - 2 kg after a week of application-based weight monitoring.
- I maintain my weight.

- I gained 1-2 pounds after 1 week of implementing the application-based diet.
- Other:

After a while of use, no matter how you change your behavior, you must bring yourself a result. Our question is to collect results from users after 2 weeks of using the app:

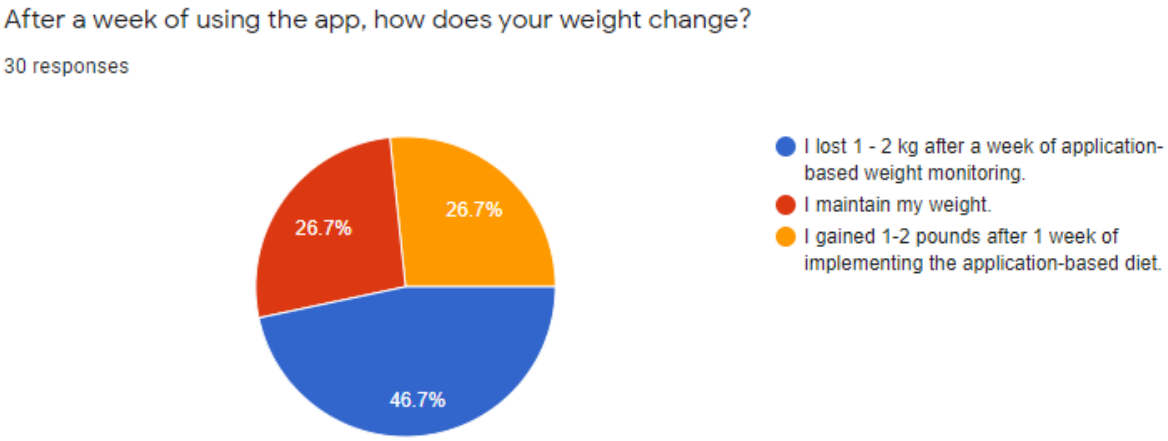


Figure 18: Group of research questions 12

There are 46.7% of users showed that they lost 1 to 2 pounds while tracking their own weight and based on the eating methods and routes that the application provides. 26.7% of users report that they have kept their weight while on self-weight monitoring. Similarly, 26.7% of users showed that they improved their weight by 1-2 pounds. Based on the purpose of using the application, we find that the product meets the needs of 90% of users. This result further confirms the accuracy of the user's self-weight tracking regime on the application. It supports the hypothesis, which is an accurate application of calorie calculation and delivers the desired results for the user's weight.

III. Conservation

We followed and observed 1 participant X using the app for 2 weeks, the participant choosing a 1200 calorie daily schedule. This weight loss diet plan helps the practitioner lose 1200 calories in just 7 days, designed by dietitian Eating Well and others. Diet provides a balance of nutrients, helps people perform weight loss and control their own weight.

Here's how you track participants' 7 days of healthy eating:

	Breakfast	Lunch	Snack	Dinner	Calories Count
Monday	Cheesy Frittata with Bacon, Peppers, Spinach, and Onion (250 calories)	Autumn Pork Roast with Apples, Onions, Carrots and a Backed Sweet Potato (500 calories)	1 cup berries (70 calories)	Chicken sheet pan dinner with sweet potatoes and broccoli (385 calories)	1205
Tuesday	Green "Power Morning" Smoothie (365 calories)	Leftover Spaghetti Squash Bolognese (230 calories)	1 cup of Greek yogurt (120 calories)	Autumn Pork Roast with Apples, Onions, Carrots and a Backed Sweet Potato (500 calories)	1215
Wednesday	2 slices of whole wheat toast with ½ avocado (300 calories)	Leftover Spaghetti Squash Bolognese (230 calories)	1 bag mixed salad + shredded rotisserie chicken + 2 tbsp of your favorite dressing (330 calories)	Chicken sheet pan dinner with sweet potatoes and broccoli (385 calories)	1245
Thursday	2 slices of whole wheat toast with ½ avocado (300 calories)	1 bag mixed salad + 1/3 of the shredded rotisserie chicken + 2 tbsp of your favorite dressing (330 calories)	Apple + 2 tbsp of peanut butter (270 calories)	Leftover Slow Cooker White Chicken Chili (350 calories)	1250

Friday	Green "Power Morning" Smoothie (365 calories)	1 bag mixed salad + shredded rotisserie chicken + 2 tbsp of your favorite dressing (330 calories)	Greek yogurt (120 calories) and ½ cup berries (35 calories)	Slow Cooker White Chicken Chili (350 calories)	1200
Saturday	Cheesy Frittata with Bacon, Peppers, Spinach, and Onion (250 calories)	Autumn Pork Roast with Apples, Onions, Carrots and a Backed Sweet Potato (500 calories)	1 cup berries (70 calories)	Chicken sheet pan dinner with sweet potatoes and broccoli (385 calories)	1205
Sunday	Cheesy Frittata with Bacon, Peppers, Spinach, and Onion (250 calories)	Autumn Pork Roast with Apples, Onions, Carrots and a Backed Sweet Potato (500 calories)	1 cup of Greek yogurt (120 calories)	Minestrone (360 calories)	1230

One Week 1,200 Calorie Meal Plan: Grocery List

To make a 1200 calorie meal for a week, here is a list of foods used:

Grocery List				
Produce	Aisle	Meat	Dairy	Pantry Freebees
3 bananas	Frozen pineapple	1 whole rotisserie chicken	3 single contain Greek yogurt	Salt

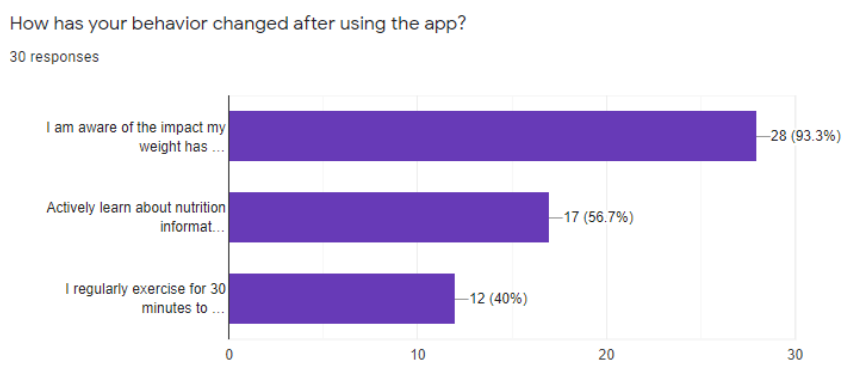
Berries	Frozen corn	2 lbs. bone-in, skinless chicken thighs	Shredded cheddar cheese	Black pepper
3 apples	Rolled oats	1 lbs. ground turkey	Shredded mozzarella cheese	Chili power
2 lemons	A box of small pasta	2-4oz boneless, skinless chicken berates	Grated parmesan cheese	Ground cumin
2 bags of spinach	1-quart unsweetened almons milk	2lb. pork shoulder	Milk	Paprika
3 bags salad	1 bottle of salad dressing	2 dozen egg		Garlic power
1 bunch kale	16oz can, diced hatch green chilies			Bay leaves
3 red onions + 3 white onions	2 -15.5oz can white kidney beans			Red pepper flakes
2 head of garlic	2-14oz can diced tomatoes			Dried oregano + parsley + basil
Fresh cilantro + Fresh rosemary + Fresh sage	Tomato paste			Apple cider vinegar + Balsamic vinegar + red wine vinegar

1 spaghetti squash	3-puarts low sodium chicken broth			Canola oil + Olive oil
4 sweet potatoes	Loaf of sliced while grain bread			Cooking spray
1 russet potatoes	9 oz apple juice or apple cider			Honey
1 head broccoli				White sugar
5 carrots				Peanut butter
3 ribs celery				
1 red bell pepper				
1 zucchini				
1 head cauliflowers				

VI. Finding of research

From the results of quantitative and qualitative research, we draw some conclusions as follows:

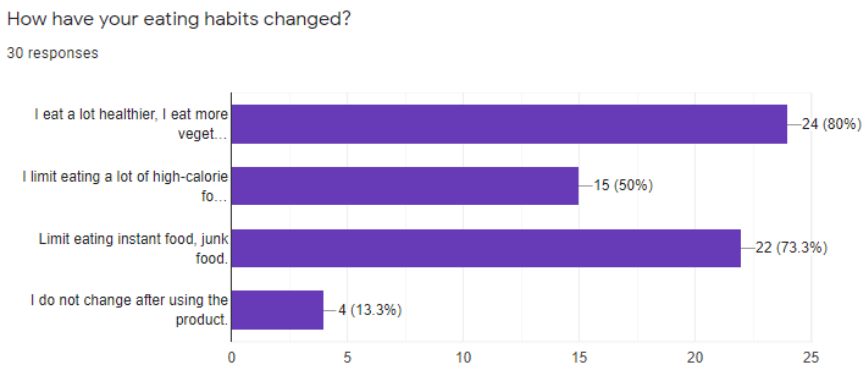
The MyFitnessPal weight management app promotes self-tracking of the user's weight. From the survey and interview results, observation, we find that app users are gradually changing their behavior and consciously controlling their own weight by eating healthy and combining eating and exercise to control daily calorie intake.



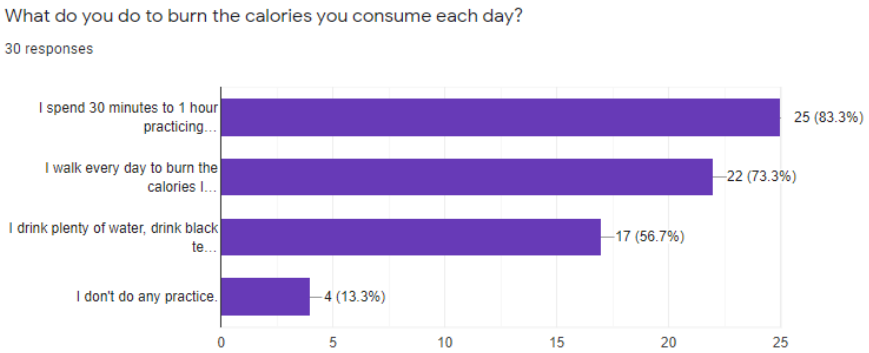
Firstly, **users have had healthier eating habits, combine exercise regimen and diet, and be aware of**

the importance of a healthy weight. From the survey results, 93.3% of the participants realized that they were aware of the impact of their weight on their health, and they developed a more affordable and healthy diet formerly.

Users have more positive change in eating habits such as changing dietary ingredients, limiting high-calorie foods, fast foods, actively eating vegetables, fruits and fresh foods. Specifically, 80% of users show that they eat healthier, it is shared that in the eating ingredients, they eat more fresh vegetables, fruits, and foods. There are 50% of users who think that when calorie counting, they limit eating high-calorie foods and replace them with other low-calorie, healthy foods. Besides, 73.3% of users indicated that they limit eating fast food. This is clearly seen in students, who often eat fast food to save time. But they do not know that fast food is not really good for their health. Still, 13.3% of the users showed that they didn't change anything. From the above results, users have built their own diet to balance calories in their own way. In addition to the results from the survey, the change in habits was also evident when we did interviews, how users shared how their eating habits changed. Specifically, students who are students, have an unhealthy diet, often eat most of what they like and fast food to save time. Participant shared that their diets changed using the weight management app. Before using the application, participants normally consume about 3000 calories a day, compared to the standard calorie intake, they have a surplus of about 1000 calories. After using the app for a week, the participants claimed that they only consumed about 1773 calories. While these are not the best calories, they are working hard to continue to change their eating habits more actively. A review of (Jason Gilliland, 2014), he evaluated the development and results of the intervention of smartphones to improve knowledge, buy and consume healthy local food, based on theories. has been validated on behavior change and behavioral economic theory. His reports are the results of application engagement and satisfaction that have been monitored qualitatively and quantitatively, including through interviews, surveys and website analytics software. Results showed that participants who were more active with the



app also experienced positive behavioral changes towards healthy eating (as measured by an increase in healthy food consumption and a decrease in actual consumption. unhealthy products), and satisfied with the end result. Users who participated more with the app were more likely to see the following behavioral changes: decreased consumption of fruit juices, soft drinks, diet soft drinks, sugary foods, fast food, and prepared meals; and increased consumption of fruits, vegetables, and homemade meals. The users who saw the most positive changes in healthy behaviors had previously indicated their desire to eat less sugar and processed foods, and to receive tips about portion sizes. These users were also more likely to report that they found the app to be useful as a learning tool in every way surveyed (e.g., health benefits of specific foods, local foods, foods that are "in season," sales by the market vendors, recipes, produce storage, and preparation suggestions).



In addition to changing eating behavior, users also focus on changing practices. The interview results showed that 46.7% of users, after using the app, can learn how to exercise to consume calories and the effect of food on daily calorie intake. **Participants built for themselves an active training routine to burn excess calories consumed daily.** Specifically, they have taken measures, with 40% of users saying that after using the application they have formed a daily exercise routine. Plus, 83.3% of people use them to burn calories by spending 30 minutes to 1-hour practicing exercise in order to burn calories and balance calories consumed and burned. 73.3% of users choose simple ways like walking every day to burn the calories they consume. 56.7% of users drink water and black tea, which is also a simple way without wasting time to burn the calories consumed by participants. However 13.3% of people still use it, they don't practice. The amount of calories we consume every day is different, so we need to build a plan to burn calories each day. Based on the results of the interview, the participants said that they also develop a plan for themselves, to improve their health and also to burn calories daily. To save time they do the short exercises provided on the Blog function, otherwise they will take the time to walk and jog to burn

calories. Every day, users give themselves 30 minutes to practice. This is a good habit to demonstrate for behavior change in a more positive way.

Other point, users are aware of the impact of weight with health. **In other words, MyfitnessFal application helps users to be aware of the importance of weight to health, motivating users to learn nutritional information maintain and formulate yourself a diet to protect your health**. This is easily demonstrated in the user's behavior of tracking nutritional information. The survey results show that, before using the application, the user does not find out about nutrition information about the food ingredients that they eat. Specifically, before using the application, there are very few users to learn about nutritional information, it only accounts for about 7% of all users participating in using the application. However, after using the application, 76.7% of users said that they review nutrition information of food before eating. They assume that they view this information directly from the Blog and Dairy functions of the application. The number of users interested in nutrition information is 70% higher than the first friend. This is the easiest manifestation of a change in behavior in terms of understanding nutritional information. Our results are also consistent with previous research showing that regular food intake is the key to treating obesity and controlling participants' weight. The study (Brian Yoshio Laing, 2014), suggests that study participants may want to lose weight but are not ready to do the work needed to monitor their diet by themselves. Although all the participants responded that they were 'concerned with losing weight' during the screening, we did not clearly measure their willingness to change or motivation. The relative lack of variation in behavioral mediators may indicate that most participants were not willing to invest time in calorie tracking themselves.

The MFP application helps users accurately calculate calories from the food that users consume every day, helping users to build a reasonable eating strategy. From the interview participants shared that their normal day consumes about 3000 calories. The recommended caloric intake for this item for a person is only about 1650 - 2200 calories only. Each day they consume an excess of about 1000 calories. When using the dairy function of the app, first one knows exactly how many calories I consume, and how much excess calories per day. Based on onservation, users who lose weight because they don't have time to exercise, they formulate eating strategies that follow the rule of 1200 calories a day, from which they learn about active foods in 1200 calories, divided. they are taken every day of a week so that you eat and

drink in no excess of the prescribed calories. Base on (Laing BY, 2014), Using a checklist, we asked participants, “What do you like about MFP?” Of the 83 participants who responded, 100% reported it was easy to use, 88% reported they enjoyed receiving feedback on their progress, 48% reported it was fun to use, 42% enjoyed the reminder feature, 13% liked the social networking feature, and 83% reported “other.” The most common “other” reasons were that MFP increased awareness of food choices or portion size (18%), provided a thorough database of foods (17%), and included a bar code scanner (10%). Some participants commented that they were able to maintain an improved diet but stopped using the app. Responses from interviewees who had lost more than 4.5 kg included the following: “I realized I was consuming 5000 to 6000 [calories] per day, and afterward I never ate that much again!”; “The app showed me where my problems are—so I reduced portion sizes and cut back on alcohol, carbs, and sweets”; “It really makes you look at what you're eating. It helped me select healthier foods and stay on track”; “Thanks so very much for introducing me to this excellent weight-loss program. It has been a life-saver.”

According to (Asmaa Alnuaimi, 2019), mobile technology has emerged as a potentially useful application in weight loss management support. While a number of empirical studies have demonstrated the positive effects of mobile-based interventions, such effectiveness is still a subject of debate. The current system involves searching electronic databases for studies on the use of mobile application-based interventions in the management of overweight and obesity in adults over 18 years of age in muscle tissue. primary and secondary care departments. The results of the review of (Asmaa Alnuaimi, 2019) show that mobile apps are effective tools for managing weight loss and maintaining that loss when compared to conventional interventions. and manual that users normally apply. Basing on (Jing Zhao, et al., 2016), In total, a number of studies have performed and described applicable interventions aimed at improving physical performance, weight control, and dietary control. Rabbi et al. (Rabbi M, 2015) found that participants using applications based on contemporary behavioral science theories walked significantly more than the control group after 3 weeks; moreover, user reviews more positively than the app's personalized recommendations than general, non-personalized recommendations created by experts. Laing et al. (Laing BY, 2014) demonstrated that one of the most popular commercial weight loss applications, MyFitnessPal, is based on the cognitive social theory effective in helping overweight patients lose weight under clinical conditions for a period of 6 months. A case-control study [26]

determined that weight, fat mass and body mass index (BMI) were significantly reduced in the intervention group compared to the control group. Carter et al (Carter MC, 2013) compared a group of applied interventions (created on an evidence-based behavioral approach) with two other control groups, one using a paper food diary and the other group used an online food diary. Over the 6-month study period, compliance was statistically significantly higher for the mobile app group compared to the online site group and the paper journal group. Furthermore, change in average weight, change in BMI and change in body fat were highest in the application intervention group.

V.Limitation and improvement

1. Limitation

The study's shortcomings are the aspects of the design or process that shaped or impaired the understanding of your study's results. There are the restrictions on the potential to generalize, extend to reality and/or the effectiveness of the findings that are the product of the forms in which you originally choose to construct the analysis or the methodology used to assess the internal and external validity of the outcomes of unexpected test challenges.

Survey data is narrow: To conduct this study, we determine the positive effect of weight management applications on user self-monitoring, users here are student. We conducted surveys and interviews with users, but the subjects we gathered were concentrated in a few students in Hanoi city. We acknowledge here that the shortcomings of the project, because students in each area will be affected by the environment that has its own lifestyle. But our research focuses on students, but only in the Hanoi area.

Lack of previous research on this topic: Previous citations and references will form the research basis for our document and project, which gives us the basic theory for the question. research that I am doing. However, research papers on this topic are very limited, or not disclosed, requiring a large fee for a document. So our evidence and base for this topic is very little.

Limit methods / tools used to collect data: After completing the analysis of research results, we found that our data collection limited our ability to analyze the data. For example, we run an observation, to track how any user changed when using the weight management app, but we can only track 1 participant, Because the number is too small, the quality of the method is not objective and accurate.

Time Limit: Our project starts and ends in 1 month, we bring the app to users for 2 weeks. This is the time for users to realize their change compared to the old time, but it is still not easy. We need more time to track and survey to track changes in user behavior.

2. Improvement

When researching, we have foreseen the limitations of the project, so we have come up with corrective methods to ensure the accuracy of the project.

We conduct student survey at many schools above when surveyed area. Specifically, we conducted a survey of students using the application in the 5 schools above while in Hanoi to ensure the objectivity of the survey. Although in the Hanoi metropolitan area, the universities do not focus on a certain area, but spread the garbage throughout the city. We interviewed many universities in different regions, in many different professions and training environments to ensure objectivity. Then analyze the obtained data to give the most intuitive results. Secondly, because there is very little research on this topic, the topics we are working on are for a fee or not on the internet. That is why we need mentor's help, help us contact us and guide us to find the right sources of citations. Thirdly, because of the limited time, to keep up the research schedule. Instead of shortening the time for the processes, we carry out the processes in parallel, to ensure the research time is enough to collect the most accurate data.

Besides the improvements in the research process. We make a number of improvements in the future to continue developing the project such as:

Extending the scope of the research: As we have stated in the limited section, the scope of our research is students in the Hanoi area. Only students in the Hanoi area are not objective enough to comment on the impact of weight management applications on users' self-monitoring mode. To continue developing the project, we expand the project in other cities such as Ho Chi Minh, Da Nang, Can Tho, etc to collect research data correctly.

Mixed method collect information: Currently, our research applies 3 main methods of information collection: survey, interview and observation. If the research can continue to develop in the future, we would like to incorporate more methods such as quesionaries, focusgroup to gather information and

have a multidimensional view of the answers coming from users. From there a rich result, easy to analyze and find new ideas.

Extending the time of project implementation: We think 1 month is a short time for us to do the project. If the project continues, we will design a period of 4-6 months to research. Research duration greatly affects the amount of research, and the quality of the time it takes to test products. That is why we want to build a sufficient time for users to use the experience and see how users change and the impact of the weight management application on users.

VI. Conclusion

Mobile technology is increasingly recognized as an effective platform for improving behavior change. Furthermore, the use of mobile computing, mobile devices and information, and communications technology is increasingly expanding into the healthcare industry as platforms for behavior change. This study shows that mobile apps have the potential to facilitate the improvement of healthy eating habits and self-weight management on the basis of science and information. nutrition. However, further studies are needed to find out if these interventions have long-term sustainable benefits and can be used effectively on a large scale. Our articles research and evaluate the impact of weight management applications on users. We proceed to provide the MyfitnessPal app, which is a weight management app for users. After conducting research, we collect user information and data after using the app, which we collect and as evidence to prove the effectiveness of the application on health, eating habits and behavior of the user. The results we obtained show that MyfitnessPal application in particular and weight management applications in general positively affect the user's behavior, helping users to be aware of the effects of weight. With health, be aware of the importance of food and drink, change eating habits and exercise.

VII. Apendix

1. Research Proposal Form

Research Proposal Form

Student Name: Nguyen Thu Thuy **Student Number**: GCH18395

Tutor: Do Tien Thanh **Date**: 16/09/2020

Unit 13: Computing research project

Propose title: Smartphone Applications for promoting healthy diet and control Weight.

Section One: Title, objective, responsibilities
Research question: How do smart application improve the accuracy and completeness of self-tracking diet in weight control? **Objectives** I want to learn: • How the effect of weight on human health? • What is a smart weight management app? • Why do choose smart application instead of other platform? • How does this app collect data to promot healthy diet and track your weight? • Application to calculate nutritional data based on which method? • How did the participants react? • How did participants change their behavior while using the app?
Section Two: Reasons for choosing this research project
The reason for choosing a project • I know and understand the importance of weight to human health and the convenience of phone application and the popularity of the application. • The issue of weight is more and more interested and focused by researchers and

developers, so we have a lot of material and resources to study.

- I think the weight tracking application brings good results to the user, with a wide development ability.
- I am having a research article on smartphone application to help users track and control their weight.

Section Three: Literature sources searched

The initial sources which could help me to answer those questions:

1. Document 1: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4725321/

   Important of weight with human health.

   Accuracy of Diet and Nutrition Measurements

   Randomized Controlled Trials

2. Document 2: https://www.hindawi.com/journals/bmri/2015/841368/

   Strategic approach and behavioral change theory

3. Document 3: https://academic.oup.com/advances/article/8/2/308/4558066

   Effecting Behaviour Change

   Participant Reactions

4. Document 4/ URL 4/book 4..

Use of key literature sources to support your research question, objective or hypothesis:

Section Four: Activities and timescales

1. Collect materials relating to research's question and objectives
2. Complete research proposal
3. **Milestone 1[11-6]**: Get feedback from the Tutor about the research proposal
4. Produce project plan
5. Writing literature review and represent the findings in term of hypothesizes
6. Check project progress: research proposal, plan, literature review
7. Preparation for primary research(to confirm the findings in literature review or clarify the questions might arise after the literature review)
8. **Milestone 2[25-6]**: Get feedback from the Tutor about the plan of primary research.

9. **Milestone 3[27-6]**: Get feedback from the Tutor about the result of literature review
10. Conducting the primary research
11. **Milestone 4[16-7]**: Represent the findings in primary research and get feedback from Tutor
12. Writing assignment 1 which contains LO1, LO2
13. **Milestone 5[29-7]**: Submit assignment 1 -Draft
14. **Milestone 6[1-8]:** Submit assignment 1- Final
15. Writing Assignment 2 which contain LO3, LO4
16. **Milestone 7[10-8]:** Submit assignment 2 -Draft
17. **Milestone 8[12-8]:** Presentation- put everything together.
18. **Milestone 9[18-8]:** Submit assignment 2- Final

Activities to be carried out during the research project (e.g. research, development, analysis of ideas, writing, data collection, numerical analysis, tutor meetings, production of final outcome, evaluation, writing the report) and likely durations:

Milestone one:

Target Date(set by tutor)

Milestone two:

Target Date(set by tutor)

Section Five: Research approach and methodologies

- Research process: sequential
- Research classes: quantitative and qualitative
- Research methods: case study, survey

Type of research approach and methodologies you are likely to use, and reasons for your

choice:

What your areas of research will cover:

Comments and agreement from tutor

[This part not for student]

Comments (optional):

I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate.

Agreed: ..... (Name) ..... (Date) .....

Comments and agreement from project proposal checker (if applicable)

[This part not for student]

Comments (optional):

Agreed: ..... (Name) ..... (Date) .....

3. Ethical Form

Section One: Basic details

Project title: Application control weight help student improve eat healthy and self-tracking weight.

Student name: Nguyen Thu Thuy

Student number: GCH18395

Programme: Computing research project

School: University of Greenwich

Intended research start date: 09/09/2020

Intended research end date: 06/01/2020

Section Two: Project summary

Please select all research methods that you plan to use as part of your project:

- Interviews ☑
- Questionnaires ☐
- Observations ☐
- Use of personal records ☐
- Data analysis ☐
- Action research ☐
- Focus groups ☐
- Other (please specify): .....

Section Three: Participants

Please answer the following questions, giving full details where necessary.

Will your research involve human participants?

Who are the participants? Tick all that apply:

Children aged 12–16: ☐ Young people aged 17–18: ☑ Adults: ☑

How will participants be recruited (identified and approached)?

Describe the processes you will use to inform participants about what you are doing:

How will you obtain consent from participants? Will this be written? How will it be made clear to participants that they may withdraw consent to participate at any time?

Studies involving questionnaires:

Will participants be given the option of omitting questions they do not wish to answer?

Yes: ☑ No: ☐

If No please explain why below and ensure that you cover any ethical issues arising from this:

Studies involving observation:

Confirm whether participants will be asked for their informed consent to be observed.

Yes: ☑ No: ☐

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

Yes: ☑ No: ☐

Will participants be given information about the findings of your study? (This could be a brief summary of your findings in general.)

Yes: ☑ No: ☐

Section Four: Data storage and security

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998):

Yes: ☑ No: ☐

Who will have access to the data and personal information?

During the research:

Where will the data be stored?

Will mobile devices (such as USB storage and laptops) be used?

Yes: ☑ No: ☐

If yes, please provide further details:

After the research:

Where will the data be stored?

How long will the data and records be kept for and in what format?

Will data be kept for use by other researchers?

Yes: ☐ No: ☑

If yes, please provide further details:

Section Five: Ethical issues

Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:

It is important that you demonstrate your awareness of potential risks that may arise as a result of your research. Please consider/address all issues that may apply. Ethical concerns may include, but are not limited to the following:

- Informed consent.
- Potentially vulnerable participants.
- Sensitive topics.
- Risks to participants and/or researchers.
- Confidentiality/anonymity.
- Disclosures/limits to confidentiality.
- Data storage and security, both during and after the research (including transfer, sharing, encryption, protection).
- Reporting.
- Dissemination and use of your findings.

Section Six: Declaration

I have read, understood and will abide by *[insert centre name]* Research Ethics Policy:

Yes: ☑ No: ☐

I have discussed the ethical issues relating to my research with my Unit Tutor:

Yes: ☑ No: ☐

I confirm that to the best of my knowledge:

The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.

Name: Nguyen Thu Thuy

Date: 30/12/2020

Please submit your completed form to: Tutor: Mr.Do Tien Thanh

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