



Guagua National Colleges
Guagua, Pampanga

An Efficiency Activity Tracker for the Municipality of Guagua

A Capstone Project

Presented to the Faculty of
Science, Technology, Engineering and Mathematics Track
Senior High School Department

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AN EFFICIENCY ACTIVITY TRACKER FOR THE MUNICIPALITY OF GUAGUA

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Abstract

An activity tracker is a transferrable system that can be used to monitor workers if they are working or not. The lack of efficiency of the employees at the Municipality of Guagua, Pampanga is quite noticeable. The researchers chose the Municipality of Guagua, Pampanga as their locale whilst the respondent was chosen purposively. The criteria [Must be a graduate of Computer Science (with the credentials), Must have an adequate amount of work experience (5 years)] must be met in order to choose the right respondent for this research. The researchers used qualitative method resulting in an interview with the selected interviewee/respondent. Through the narrative analysis, the researchers were able to gather the answers they needed to support their project. Therefore, the researchers concluded that the activity tracker will make the employees at the municipal work more efficiently.

The researchers had chosen the Municipality of Guagua as their locale for this research. The researchers went and interviewed the people and it also added to the list of why they chose the place, it is because of their workers that got too many to count, and a supervisor or a work monitor can ease the atmosphere around.

There are many workers that are currently employed in the Municipal but only 97 of them are working behind monitors. The population of employees in the Municipal are 435, including the office workers.

Statement of the Problem

Having to work efficiently is not just a simple task. But what happens when you don't work efficiently? The problem that the Municipality might face is: Complaints. Complaints from civilians can result in a dangerous situation for both the employees and the Municipality itself, especially when the civilians files their complaints at the Civil Service Commission.

Scope and limitation

The researchers will be conducting a interview and product/software testing to determine how it can really make a group of employees to work more efficient in the Municipality of Guagua, Pampanga. The main source of information that will be gathered in the interview will come from the IT department inside the Municipality.

An Activity Tracker allows a business to track activities and monitor worker engagement with workplace related tasks. A locale using employee monitoring on a computer can measure productivity, track attendance, ensure security and collect proof of hours worked. Although it can monitor the employees, it can only do up to a certain extent, meaning that it cannot send messages through specific computers. It cannot fully function by its own and needs to be booted by the server in order for the whole group of employees to be monitored.

SIGNIFICANCE OF STUDY

The results of the study will be of great benefit to the following:

Companies. It improves the use of the hardware of the company, through the control of its good operation.

If, for example, a computer is not working properly, the monitoring system will detect it, give notice of it and the decision, to repair or replace it, may be made.

Administrator. Technology is something essential for a company's work, that does not mean it is infallible. Faults that give rise to sometimes critical situations may appear at any time. Therefore, in any company, in which a computer infrastructure is important, it will be necessary to control the correct operation of it so that a possible error does not end up affecting the service given to users.

Security Management. It prevents incidents and when these incidents happen, they are detected faster, which saves time and money.

Future Researchers. This study will provide insights on how to continue or take on a study relates to this one.

Conceptual Framework

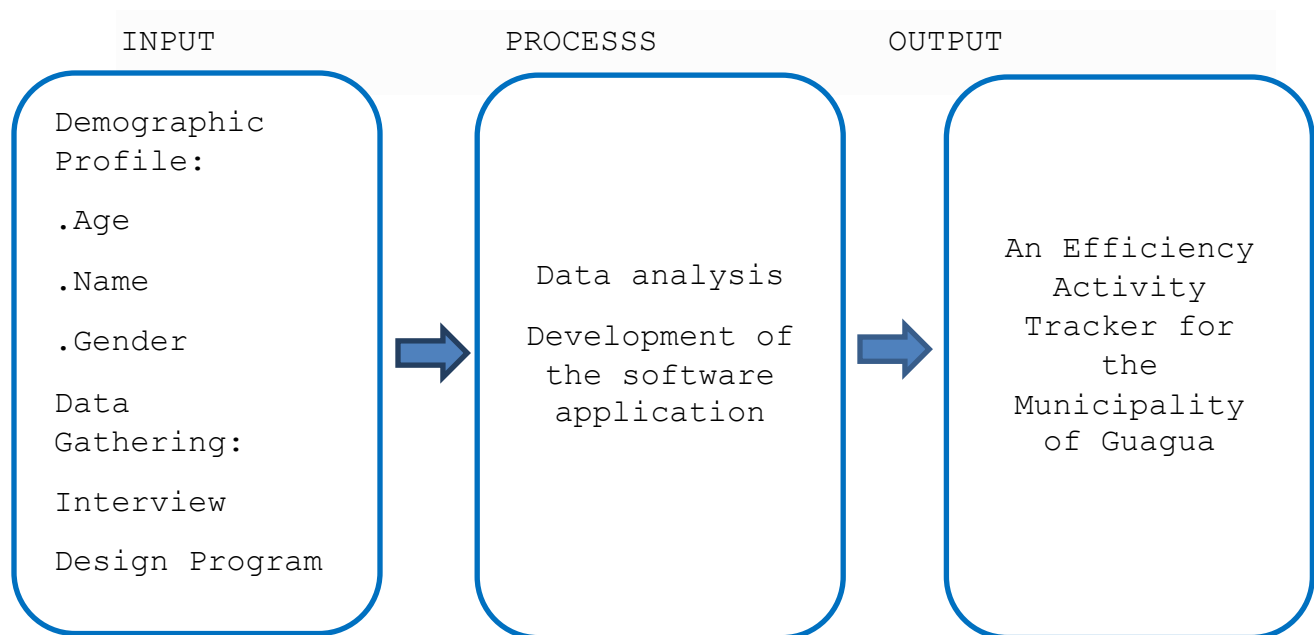


Figure 1: Conceptual Framework

Review Relevant Literature

According to Soutiere (2009), wearable activity trackers (WATs) have become increasingly popular for their purported ability to provide users with real-time, tailored information about their daily health-related activities. These devices are portrayed as user-friendly and beneficial to well-being, which raises the question of their potential application for health promotion among military populations. However, the rapid evolution of WAT technology is outpacing efforts to test, evaluate, and validate these devices. Therefore, the purpose of this systematic review was to summarize the evidence on WAT reliability and validity for measuring physical activity (PA) and sleep, and the utility of incorporating WATs in behavior modification programs.

Chan (2017), also stated that wearable devices for tracking activity are designed for efficiency in reaction to developing technologies and knowledge. The methodology of this Research Paper establishes a theoretical framework through literature reviews discussing the management of health and fitness through activity and exercise; devices and technologies as a tool for measurement and understanding; their use and integration in daily life as an extension of the body.

Nystrom (2014), had an experiment in which he discovered that mapping tools are also a fundamental in creating an activity tracker, this thesis shows that it is possible to map usability and user tracking tools based on their properties. The mapping is useful when deciding upon which tool to use. This showed that in order to gain a firm understanding about security, one must further investigate the matter. The only option to gain full control

of data is to store it locally. “Finally, I have analysed educational challenges within these tools.” This analysis showed that challenges mainly lie within communication and the design of tutorial video material, and this will impact on how much resources the tools require.

According to Calma (2018), the academic success of individual students differs widely and it depends on various factors, ranging from financial to social and to health aspects. In this article, we propose a concept for a novel productivity tracking system that provides the basis for a self-assessment of academic behaviour and that can be used by students to support their academic success.

Calma believed that an activity tracker can benefit not only employees but also students that are having difficulties in terms of academics.

Many were claiming that when you monitor a specific person on a computer, it is said to be against the law. According to Stumpf (2013), federal and most state privacy laws give discretion to employers as to how far they can go with their employee monitoring program. But monitoring computer web activity is different and can fall under different legal precedent. There are different types of computer monitoring software solutions, some with the capability to let you know exactly what employees are doing on their computers. Therefore, monitoring computer web activity is legal and can be used by companies or other office surveillance.

There were cases of sedentary behaviors occurring in some workplace. Some people claimed it to be their work load and the hours that their working. According to Guitar

(2018), this study investigated whether Fitbit devices can reduce sedentary behavior among employees in the workplace. Participants were asked to wear Fitbits during 8-hour work shifts, 5 days per week, for 8 weeks. They were instructed to stand at least once every 30 minutes throughout the workday. The goal of the study was to determine whether standing once every 30 minutes was a feasible strategy for reducing sedentary workplace behavior. On average, participants completed 36 of 40 workdays using Fitbits. These results indicate that Fitbit technology is effective for recording and tracking interruptions in sitting time; however, to reduce sitting behavior, alternate approaches are required to motivate larger numbers of workers to participate.

According to Longo (2017), an event tracker system for transmitting and recording events, the event tracker system including an event tracker and software application. The event tracker is an energy source powered-device with an electronically coupled plurality of buttons for activating the device and transmitting event data, and a time and date stamp associated with the specific chosen plurality of buttons as indicated by event specific iconic symbols. The software application is configured and uniquely keyed to communicate securely and solely with the event tracker and receives the event data via the wireless communications link. The software application has various application screens for presenting recorded data to a user.

Longo made the buttons easier to understand. The logic of seeing an icon within the button can reduce the time of understanding what a button does. These type of configuration can also help the employees to communicate more with their employers. Thus making it a stress-free software.

Hypothesis

Positive

If for example that a company is going through a hard time monitoring their workers, then an activity tracker will minimize their work and will make them more efficient.

Negative

If for example that there are problems that surfaced on the software, that will be the bugs that may occur during the trial and error phase, then updates and patches will be conducted, causing a delay within the server and a temporary shutdown.

Objectives of the study

The main objective of this study is to provide a software that can help minimize work and can make the workers more efficient in the Municipality of Guagua.

Methods

Respondent's Characteristics

The researchers chose to gather information inside the Municipality of Guagua. The respondents who will be interviewed in the study is an IT personnel who works at the Municipality of Guagua.

Sampling Procedure

Purposive Sampling

The researchers chose this sampling procedure because it is the most effective way to gather answers and to really bring out the results in this research. The researchers

used their judgement to select a sample that is most useful to the purpose of this research. Therefore, using this procedure will greatly help them gain data for their objective.

Power and precision

The researchers have made a criteria that an IT personnel to meet. The IT personnel must be a graduate of Computer Science (with the credentials) and must have an adequate amount of work experience in the Municipality. These standards will help the researchers to gather the specified information that they need from the IT professional as well as the help for the process of installing the software through the computers.

Measures and covariates

The data that the researchers will gather will give an informative answer that can show if the software really boosted the efficiency of workers at the Municipality of Guagua, Pampanga. From the data that the researchers have gathered before, the current process that the Municipality is using to monitor their employees is by sending a supervisor or a work monitor to check on them every once in a while. The researchers will install the software with the permission of the Municipality and compare the efficiency before and after the research is conducted and processed. To completely gather data for the measures, the researchers will make some questionnaires that will be validated by the school (Guagua National Colleges) and use that to gather the required answers and results for this research.

Ethical consideration

Considering that the researchers are going to install a software on an employee's computer, it will take some consideration whether this is going to affect their work knowing that they are being monitored while working. This can affect them either for the better, or for the worse. The said risk will need to be balanced against the ethical interest in respecting the autonomy of the person affected, and their choice about whether to know or not.

Research design

The design encompasses the method and procedures employed to conduct a scientific research. The researchers used the descriptive method to understand the nature and function of the study. This has been selected to develop the monitoring system ensuring that the system will run accordingly. As the researchers consider possible study designs, analysis, and final reports about the study, questions will determine the appropriate approach to the investigations and its resulting methodology.

Descriptive methodology is concerned with the description of the existing distribution of variables, as opposed to theory building. Or, in plain language, descriptive studies focus on answering the basic W questions: Who, what, when, where. This will help the researchers to plan and carry out the study, designed to provide rich descriptive details.

Results

Respondent's Flow

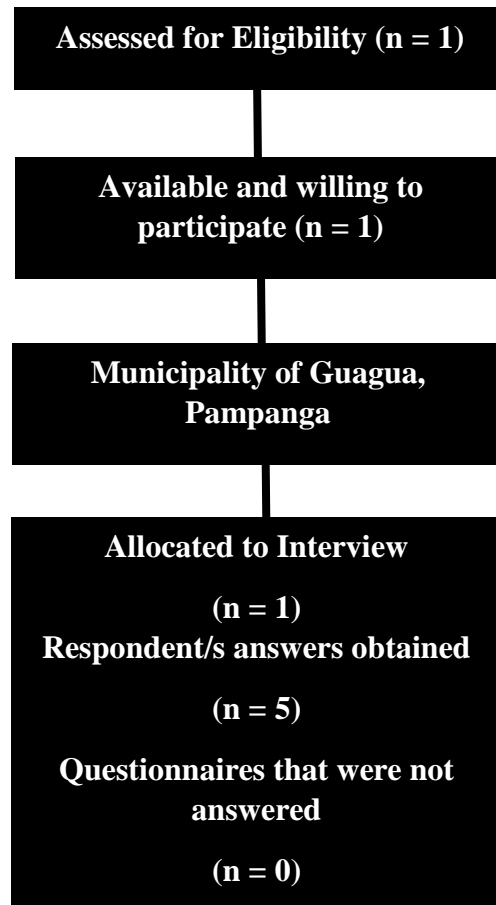


Figure 2: Respondent's Flow

Recruitment

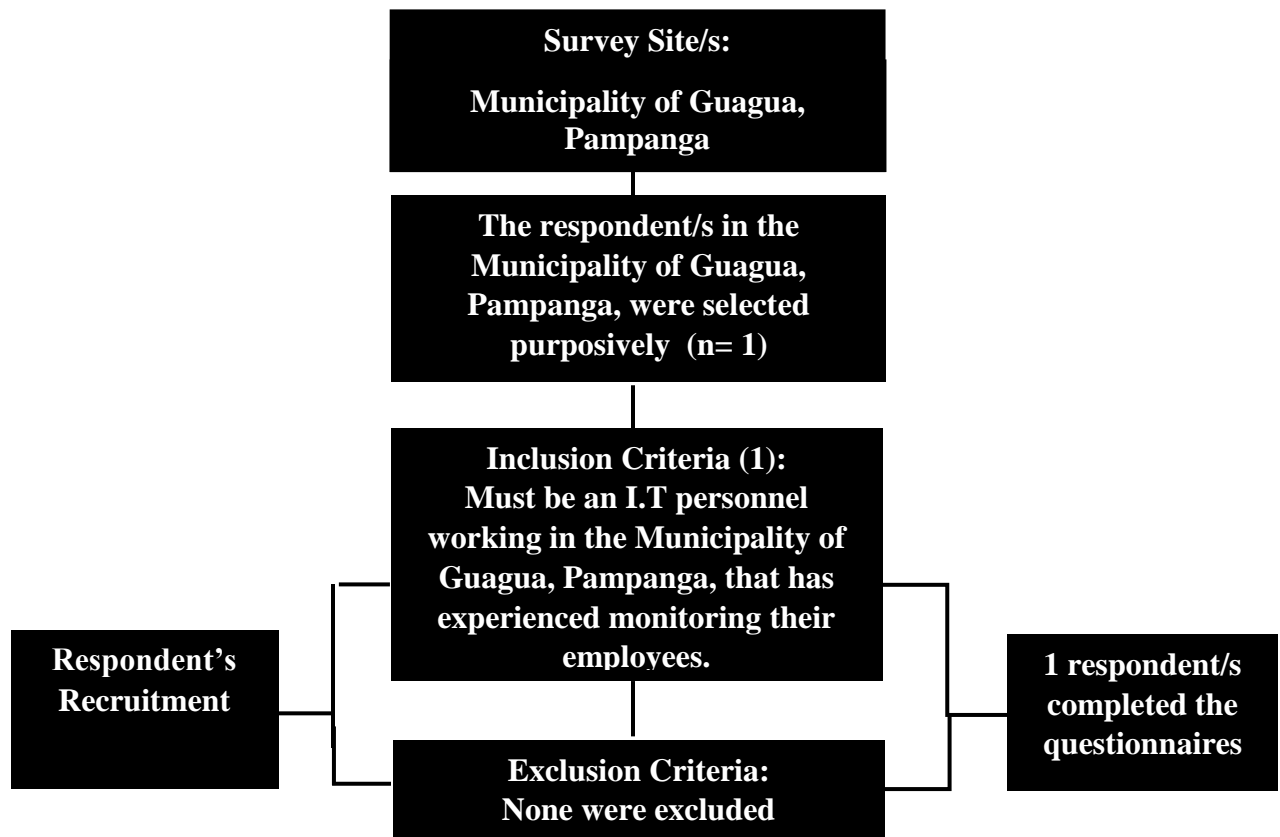


Figure 3: Recruitments' Flow

Narrative Analysis

The respondent/s of this study is the head I.T personnel in Municipality of Guagua, that is located at Plaza Burgos, Guagua, Pampanga. The researchers conducted an interview to the I.T personnel about this software asking the head I.T personnel five (5) questions about the software on how will it benefit their office by this software. The I.T Personnel will be temporarily called P1 for this transcribing.

“Given the fact that work monitors only check the employees from time to time, do you think that it is an effective way for monitoring employee?” asked by the researchers. P1 thought about the question deeply and answered “We monitor them by personally and I think that it can get in the way of our time by checking on them from time to time, basically speaking, it is not an effective way of monitoring them.”

Once again, the researchers proceeded to ask P1 the questions. "If, there are case of inefficiency at the Municipal, do you think that an activity tracker can make the employees more efficient at work?" asked by the researchers. P1 answered “ Yes, there is not much to say about this because if you can work efficiently and more smart, then it can be considered a benefit to everyone.” P1’s answered honestly.

The researchers were delighted to hear that P1 is agreeing with them. "If you are an employee who is being monitored using an activity tracker, what is the advantage and disadvantages for you?" researchers asked. P1 thought about it carefully and answered with “Considering its benefits, the advantages for me will be the way that I will be working more efficient knowing that they are monitoring us. Disadvantages on the other hand, it can cause some getting used to being monitored work by work. But other than that, everything falls on the advantages side.”

According to the researchers, these were enough answers for them to continue with the experiment. But nevertheless, they continued to gather more data. "As an employer at the Municipal, what do you think are the advantages and disadvantages of an activity tracker to the Municipal itself? Added by the researchers. Considering that P1 is one of the employers, P1 answered quite confidently. “There would not be any

disadvantages to the municipal if it can greatly benefit it. But to answer your question, the advantages will be the efficiency of everyone, and that efficiency can also benefit the civilians that are going to the Municipal. If, for example, there were disadvantages, that would be the time that will be consumed while exporting the software to the servers.”

Said by P1.

The interview was meeting its end, and the last question that the researchers asked was "If you are the one in charge for monitoring the employees, do you think that an activity tracker help lessen workloads for you and your fellow supervisor's/work monitors work alike?" P1 thought about it carefully as he was the one who will be the only source of data for the interview. P1 answered “To put it simply, yes.” And the interview came to an end, concluding it to be successful.

Program Testing

This table will serve as the result of the beta software to the employees. The researchers gathered 10 employees (5 with the tracker and the other 5 without the tracker):

Table 1

Tracked Employees

With the Tracker	Sample Tasks	Start to End Time	Total Time Consumed
Employee 1	Update Word Documents	ST- 9:37 a.m ET- 9:52 a.m	15 minutes
Employee 2	Delete Special Symbols on Files	ST- 10:01a.m ET- 10:19a.m	18 minutes

Employee 3	Additional Content Ppt.	ST- 9:43 a.m ET- 9:58 a.m	15 minutes
Employee 4	Remove all columns on Excel	ST- 9:37 a.m ET- 9:41 a.m	4 minutes
Employee 5	Update all Excel Sheets	ST- 9:44 a.m ET- 9:54 a.m	10 minutes

Table 2

Untracked Employees

Without the Tracker	Sample Tasks	Start to End Time	Total Time Consumed
Employee 1	Update Word Documents	ST- 9:39 a.m ET- 10:02 a.m	23 minutes
Employee 2	Delete Special Symbols on Files	ST- 10:03a.m ET- 10:22a.m	19 minutes
Employee 3	Additional Content Ppt.	ST- 9:32 a.m ET- 10:03a.m	29 minutes
Employee 4	Remove all columns on Excel	ST- 9:38 a.m ET- 9:47 a.m	9 minutes
Employee 5	Update all Excel Sheets	ST- 9:43 a.m ET- 9:56 a.m	13 minutes

These table shows the difference in time between the employees who used the tracker and those who did not. Although the tracker's job is to monitor the time of their task, the employees with the tracker did a much more favourable time due to the assistance of the admin that are keeping track of the employees with the tracker.

Discussion**Summary of Findings**

The main goal of the researchers is to create a software that can monitor certain employees in their work so that they can practice efficiency. The researchers proposed

this study to help the I.T department in the Municipality of Guagua work more efficiently and so that they can use the software to help lessen the work load of the people that are monitoring them.

The researched interviewed the head I.T personnel and gathered the certain answers that the researchers needed. Concluding the result of the interview, it is highly positive and it can be considered as a success. The interview also helped the researchers determine what is actually going on behind the workers of the Municipal. The researcher found out that some employees are actually hardworking, and some of them are not. It is not a requirement for the employers to monitor the employees every time but it would be considered a benefit for them if they can monitor the employees while still being able to their respective jobs. The researchers also found info for their software whilst reviewing their findings. It is found that their software will take some time installing to every computer available and it will take some time booting up due to the state of the personal computers that are being used in the municipal.

Conclusion

The researchers gathered every data that they need and reviewed them, resulting into a positive outcome, meaning that they can continue with their research project. The interview was a great success and it was concluded that it was not necessary for the employers to monitor their workers that eagerly but it would be a great benefit for them if they can use a software that can monitor them more efficiently whilst lessening their workloads.

Stating the possible positive and negative hypothesis, it was gathered to believe that the positive hypothesis will be much more ahead than the negative hypothesis. The outcome overall is that the interview and the gathering of data is a complete success and the researchers are using all the findings for their further processing.

Recommendations

To the Employees of the Municipality Of Guagua: Monitors manually checking all of the office workers if they are really working, they usually do these every 2hours. But they can't accurately monitor their workers because except for monitoring all the office workers, they also have their own paper works. Our software is a big help for the work monitor to lessen their work and to make their work easier and be more productive, and instead of using their time on checking every worker they can use those time by doing all the other paper works that they have.

To the Municipality: The municipal should provide all the things needed to complete the software that we are doing. They should also tell immediately this to all the employees before and after the software is given to the work monitor, and they should what are the benefits of the software

For Software Advancement: Once the Activity Tracker is finished and released in Municipality of Guagua, employees should use it as early as it is downloaded so they can lessen the work they have.

Appendix A

Interview Questions

We, the group of Information Technology (12 – STEM of Guagua National Colleges), aim to conduct an interview further support our research about an activity tracker. We are politely asking for your honest answer and opinions. These are the following questions:

1.) Given the fact that work monitors only check the employees from time to time, do you think that it is an effective way for monitoring employee?

2.) If, there are case of inefficiency at the municipal, do you think that an activity tracker can make the employees more efficient at work?

3.) If you are an employee who is being monitored using an activity tracker, what is the advantage and disadvantages for you?

4.) As an employer at the Municipal, what do you think are the advantages and disadvantages of an activity tracker to the Municipal itself?

5.) If you are the one in charge for monitoring the employees, do you think that an activity tracker help lessen workloads for you and your fellow supervisor's/work monitors work alike?

Appendix B**Curriculum vitae**

Ingram M. Manuel

Maquiapo, Guagua, Pampanga

Contact no.: 09477388022

Email: meltedcheese2001@gmail.com

PERSONAL DATA:

Age	:	18 yrs. old
Date Birth	:	October 2, 2001
Place of Birth	:	Al Qaseem, Buraidah, Saudi Arabia
Gender	:	Male
Height	:	5'8 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English, Kapampangan, Arabic, Japanese
Mother	:	Hershey M. Manuel
Occupation	:	House Wife
Father	:	Genaro L. Manuel
Occupation	:	Deceased

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: Guagua National Colleges

School Address: Sta. Filomena, Guagua, Pampanga

Primary School: International Philippine School in Riyadh

School Address: Ahm Ald, King Farrar St., Riyadh, Saudi Arabia

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature

Jay Bernie S. Fernando

San Roque Dau, Lubao, Pampanga

Contact no.: 09301619346

Email: fernando.jhay48@gmail.com

PERSONAL DATA:

Age	:	19 yrs. old
Date Birth	:	January 28, 2001
Place of Birth	:	Sta, Rita, Pampanga
Gender	:	Male
Height	:	5'10 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English
Mother	:	Vilma S. Fernando
Occupation	:	Babysitter
Father	:	Bernie F. Fernando
Occupation	:	Tricycle Driver

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: Megabyte College

School Address: Mabical, Florida, Pampanga

Primary School: San Roque Elementary School

School Address: San Roque Dau, Lubao, Pampanga

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature

Gherome M. Manlapaz

Betis, Guagua, Pampanga

Contact no.: 09073330141

Email: gherome.manlapaz@gmail.com

PERSONAL DATA:

Age	:	20 yrs. old
Date Birth	:	December 25, 1999
Place of Birth	:	Sta. Rita, Pampanga
Gender	:	Male
Height	:	5'8 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English
Mother	:	Rowena M. Manlapaz
Occupation	:	OFW
Father	:	Gherald F. Manlapaz
Occupation	:	Driver/Service

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: Betis Highschool

School Address: Betis, Guagua, Pampanga

Primary School: Betis Elementary School

School Address: Betis, Guagua, Pampanga

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature

Norace Nhicole M. Gonzales

Sta. Lucia, Sasmuan, Pampanga

Contact no.: 09757278799

Email: christine.gonzales@gmail.com

PERSONAL DATA:

Age	:	17 yrs. old
Date Birth	:	May 2, 2002
Place of Birth	:	Lubao, Pampanga
Gender	:	Male
Height	:	5'6 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English
Mother	:	Claire M. Gonzales
Occupation	:	House Wife
Father	:	Ernesto S. Gonzales
Occupation	:	Welder

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: FUMCES

School Address: Bancal, Guagua, Pampanga

Primary School: FUMCES

School Address: Bancal, Guagua, Pampanga

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature

Aimiel Joachim D. Manalili

Sta. Monica, Sasmuan, Pampanga

Contact no.: 09517571973

Email: w333.haaaaa@gmail.com

PERSONAL DATA:

Age	:	19 yrs. old
Date Birth	:	July 20, 2000
Place of Birth	:	Lubao, Pampanga
Gender	:	Male
Height	:	5'11 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English
Mother	:	Karen Jane D. Manalili
Occupation	:	House Wife
Father	:	Antonio Manalili
Occupation	:	Driver

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: Sta. Lucia Academy

School Address: Sta. Lucia, Sasmuan, Pampanga

Primary School: Sasmuan Elementary School

School Address: Sta. Lucia, Sasmuan, Pampanga

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature

Ritz Andrew A. Baccay

Bancal, Guagua, Pampanga

Contact no.: 09061882556

Email: ritzpogi26@gmail.com

PERSONAL DATA:

Age	:	18 yrs. old
Date Birth	:	August 26, 2001
Place of Birth	:	San Fernando, Pampanga
Gender	:	Male
Height	:	5'5 ft
Civil Status	:	Single
Citizenship	:	Filipino
Religion	:	Catholic
Language	:	Tagalog, English
Mother	:	Elisa A. Baccay
Occupation	:	OFW
Father	:	Oscar S. Baccay
Occupation	:	N/A

EDUCATIONAL BACKGROUND:

Senior High School: Guagua National Colleges

School Address: Sta. Filomena Guagua, Pampanga

Junior High School: Lemu National High School

School Address: Enrile, Cagayan

Primary School: San Fernando Elementary School

School Address: San Fernando, Pampanga

I hereby declare that all the above furnished information is true to the best of my knowledge and I will be solely being responsible for any discrepancy found in them.

Signature