LAKBAY: A TWO-DIMENSIONAL GAME ABOUT DRIVING FUNDAMENTALS AND ROAD COURTESY AND SAFETY OF BACOOR MUNICIPALITY

HANNIE MAY G. DEFACTO
JOHN PAUL R. CONSUELO
NOMMEL ISANAR L. AMOLAT
March 2021

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

Background of the Study

Road accidents happen anywhere, anytime, with anyone. It is an inevitable circumstance that may or may not take or change our lives. It is important that we (both the pedestrians and drivers), as law-abiding citizens must be aware of the road's safety precautions and must strictly follow the rules and regulations. As for the drivers, they are the masters of the road and must be responsible for their actions especially in avoiding road accidents and taking into account the safety of the pedestrians.

The government implemented laws and regulations in order for us to have a safe and sound driving experience. The Filipino Driver's Manual of 2018 is a manual that guides motorists and all driver's license applicants in understanding the process of availing a driver's license as well as the importance and the responsibility of having it (Caguete, Sabela, Menis, & Garcia, 2018). The manual itself is in accordance with the Republic Act No. 4136 also known as the Land Transportation and Traffic Code of the Philippines which enumerates the traffic laws that all motorists (motorcycles, cars, and bike drivers) must follow on the road. Compilation of articles and chapters relative to land transportation and traffic rules to promote good driving practices not only applicable to the drivers but also to the pedestrians and law enforcers (Republic Act No. 4136 | GOVPH, 1964).

Along with this law is Chapter 2 of the Registration of Motor Vehicles which is composed of rules and regulations that an applicant is obliged to observe with regards to the issuance of a Drivers' License. Other sections of the law incorporate the preliminary provisions, responsibility for the registration and operation of the motor vehicles, and traffic rules which include the licensing and other operations related to this matter. Last August 02, 2017, President Rodrigo Duterte signed the extension of

the validity of the driver's license from three (3) years to five (5) years under the same law.

But sometimes all we need is to take the initiative and apply the following ideas: alertness while driving, avoiding aggressive driving, vehicle speed and distance, and special driving situations (Safe driving essays, n.d.). Reaching your destination safely requires attention, stay away from any distractions while driving, put down your phone, stay alert, and focus on the road. Self-control is one basic rule as a driver, there will be a lot of times that he/she will encounter unexpected confrontations on the road and one way to settle things around is having self-control (Safe driving essays, n.d.).

In concerned with this issue, the researchers proposed a study that will help the aspiring drivers and even the non-driver citizens by creating a two-dimensional game to better learn and understand the road (rules and regulations, signs, lights, and precautions).

Overview of the Current State of the Technology

Over the past few decades, Bacoor City earned its name as one of the most renowned cities in the province of Cavite. The city was known as "Bakood" during the Spaniards era and later became "Bacoor" which is now an official city in Cavite. As stated in (PhilAtlas, n.d.), Bacoor has an area of 46.17 square kilometers or 17.83 square miles which constitutes 2.93% of Cavite's total land area. Moreover, it is a coastal component city of Cavite consisting of 73 barangays and a population of 600,609 (Philippine Statistics Authority, 2016). The said figures represent 16.33% of the total population of the province making it the 14th most populous city in the country. Like any other city, Bacoor is also facing problems and issues with regard to governing the municipality. One of the said problems is vehicular road accidents which happen quite often.

Jeepneys, Buses, and Tamaraw FX Taxis are the common form of transportation for Bacooreños. Furthermore, Tricycles and pedicabs ply the different

roads in the said city. With that being said, commuters often take Jeepneys and the likes as their mode of transportation within different routes in and out of the city (About Cavite Province, n.d.). Based on Wikipedia Contributors (2021), Bacoor is described as a bedroom community with most of its citizens commuting to and from Metro Manila to work. The city is connected to Metro Manila by different expressways like the Cavite Expressway or CAVITEX and Muntinlupa, Aguinaldo Highway and Quirino Avenue, and other major thoroughfares. Considering the congestion of population of the city and its thoroughfares, it is most likely to say that Bacoor experiences daily heavy traffic frequently.

The following lists are the number of registered Vehicles in Region IV-A as of the year 2020 that falls under the category of cars with a total number of 200,845, UV with a total number of 291,874, SUV with a total number of 87,225, TRUCKS with a total number of 24,637, and BUS with a total number of 1, 481 for a grand total of 606,062. On the other hand, this is the number of registered motor vehicles, MOTORCYCLE: without Sidecar with a total of 771,461, with Sidecar with a total number of 238,635, Non-Conventional with a total number of 1,162, the Total number of Motorcycles/TCs/NCs with a total number of 1,011,258, TRAILERS with a total number of 2,687 for a grand total of 1,620,006 (eFOI - Electronic Freedom of Information - Request, 2021).

Road accidents ranked 8th as one of the main causes of death around the globe. As World Health Organizations (WHO) stated last 2018 in a global report, there were about 1.34 million deaths yearly from road accidents, and is the number 1 cause of deaths of people from ages 5-29 years old (Pino, 2019). The Philippine Statistics Authority (PSA) data, states that there were 194 deaths of young adults from ages 20-29 years old within 11,360 road-crash last 2017 (Pino, 2019). According to Center for Health Development Calabarzon (2019), last October 2019, CALABARZON (Cavite, Laguna, Batangas, Rizal, and Quezon) registered the highest transport vehicle crashes and road injury occurrences in the country with over 2,386 (16.5%) followed

by Central Visayas (Region VII) with 2,125 (14.7%) and the National Capital Region (NCR) with 1,556 (10.8%) as reported to the DOH.

According to Bacoor Traffic Management Department (2017), the main agencies reinforced by the government and is liable for maintaining peace and order are the Bacoor Traffic Management Department (BTMD) and the Bacoor Public and Safety Unit. Whilst BTMD as the highest local bureaucracy (department's status) has given the authority administer to the citywide implementation of ordinance especially about the implementation of traffic rules and regulations on the road. Additionally, securing a quality service in receiving and releasing Licenses, plate numbers, and traffic ordinance violation receipts are the goals of BTMD. They are also in charge to protect and secure the safety of motorists, pedestrians, and the public as a whole. Furthermore, the said department opts to constitute an equal ground of rights and duty with everyone (including Traffic Enforcers, Motorists, and Pedestrians) who are involved in the road in terms of rules and regulations implementation.

Statement of the Problem

In particular, the study focuses on developing a Two-Dimensional Game Application about Driving Fundamentals and Road Courtesy and Safety of Bacoor Municipality.

In conjunction with the main problem, the following problems are expected to be given light throughout the study:

1. What are the existing ways or platforms the Bacoor Municipality uses in promoting practices in Road Safety and Driving?

2. What are the Ordinances implemented in Bacoor Municipality pertaining to Road Safety and Driving?

3. What are the benefits provided by the application in relation to the Traffic Rules and Regulations on the road?

4. How does the game innovate the style of teaching Road Safety and Driving?

5. How does the game serve as a medium in conveying traffic rules and regulations efficiently?

Objective of the Study

The overall objective of the study is to be able to develop a Two-Dimensional Game Application about Driving fundamentals and Courtesy and Safety of Municipality of Bacoor.

The specific objectives of the system are listed as follows:

1. To enumerate the existing ways or platforms the Bacoor Municipality uses in promoting practices in Road Safety and Driving.

2. To enumerate all the Ordinances implemented in Bacoor Municipality pertaining to Road Safety and Driving.

3. To identify the benefits provided by the game in relation to the Traffic Rules and Regulations on the road.

4. To identify possible reasons on how a game innovates the style of teaching Road Safety and Driving.

5. To identify the factors on how the game serves as a medium in efficiently conveying traffic rules and regulations.

Scope and Limitation

The Lakbay: A Two-Dimensional Game Application About Driving Fundamentals and Courtesy and Safety of Municipality of Bacoor aims to provide a knowledgeable and useful application that can help and guide ordinary people especially the citizens of Bacoor about Road Safety and Driving. The game's concept itself is influenced by the Republic Act 4136 or the Land Transportation and Traffic Code of the Philippines.

Scope

The scope of the study revolves around the following:

Access Levels

User. The user is the one who controls the player in the game. The main goal of the game is for the player to complete every stage by meeting two conditions, the player must reach the target destination and meet the passing score of that level. Failing to do so, the player will have to redo the level. Upon finishing the stages, a Driver's License will be issued to the player as a prize for completing the game. Moreover, now that the stages are all unlocked, the player can choose freely on what stage he wants to play.

Functionalities

Below are the general functionalities that the system can offer. These enable the system to operate in different ways and communicate well with the users involved in the system.

Character Selection. Once the user inputs the information requested at the beginning of the game, the user may choose his/her preferred gender (male or female) that will represent him/her throughout the game.

Locked to Unlocked Stages. The game is composed of four stages: Barangay Road, Provincial Road, Municipal Road, and National Road. These stages are set from Easy to Difficult and must be taken in order to unlock the next stage. Upon completing the game, the stages will now be fully unlocked, then the player can freely choose on what stage he/she wants to play.

Vehicle Selection. This is where the user can choose the type of vehicle he/she will use all throughout the game. The user can choose between two types of vehicles (motorcycle or car).

Familiarization of Equipment. This refers to the review and familiarization of gears and accessories of the vehicle. The equipment to be reviewed will be based on the type of vehicle the user has chosen.

Introduction of Essentials. This refers to the presentation of the skills and tips on how to survive the game. Skills are assets possessed by the player that will help him/her in completing the game.

Tutorial Phase. This is intended for the new users of the game for them to be familiar with the flow. It is a simple instructional video tutorial on how to navigate and learn the basics of the game.

Scoring and Rating System. It is the numerical and graphical representation of the player's accomplishments in the game. The player will be rated and scored based on their score's percentage, number of correct answers, and how fast the questions are answered.

Leaderboard. This refers to the display of scores and rating of the player in every completion of a stage from the late top scores to the recent ones. Each user has the ability to have their own playthrough in a game. The users' top scores will be displayed on the leaderboard in descending order.

Timer Per Question. This is a set timer per question of the game. It is an extra opportunity for the player to gain a higher score and ratings depending on how fast the question will be answered correctly. Additional coins as a reward will be sponsored to the player in every correct answer within the time limit. Failing to answer within the time frame will not affect the progress of the game as long as the questions will be answered correctly.

Driver's License. Upon finishing the stages, a Driver's License will be issued to the player as a prize for completing the game. It is a graphical representation of the player's license and reflects the information based on the user's inputted data at the beginning of the game.

Limitation

Putting aside the functionalities offered by the system, the following are the known limitations:

1. Lakbay is a free-to-play game application that can be used by anyone as long as they have installed the application on their mobile devices. This game has no age limit but is advised to be used by 18 years old and above.

2. The android application is strictly for only playing games. The hotline numbers of the national local government offices are provided in the game but it does not mean that it will call the agency directly. The City of Bacoor Traffic Management Department can't notify information in the android user. Moreover, some part of the application needs an internet connection specifically to the social media accounts and official website of the Municipality of Bacoor.

Methodology of the Study

To employ the right process in developing the proposed system in such a short span of time. The proponents are planning to use the Waterfall Model. The Waterfall Model is useful and can provide a number of benefits where deadlines are vital (Banks, 2021). This is because the process offered by the model is very straightforward because of its linear structure (Banks, 2021).
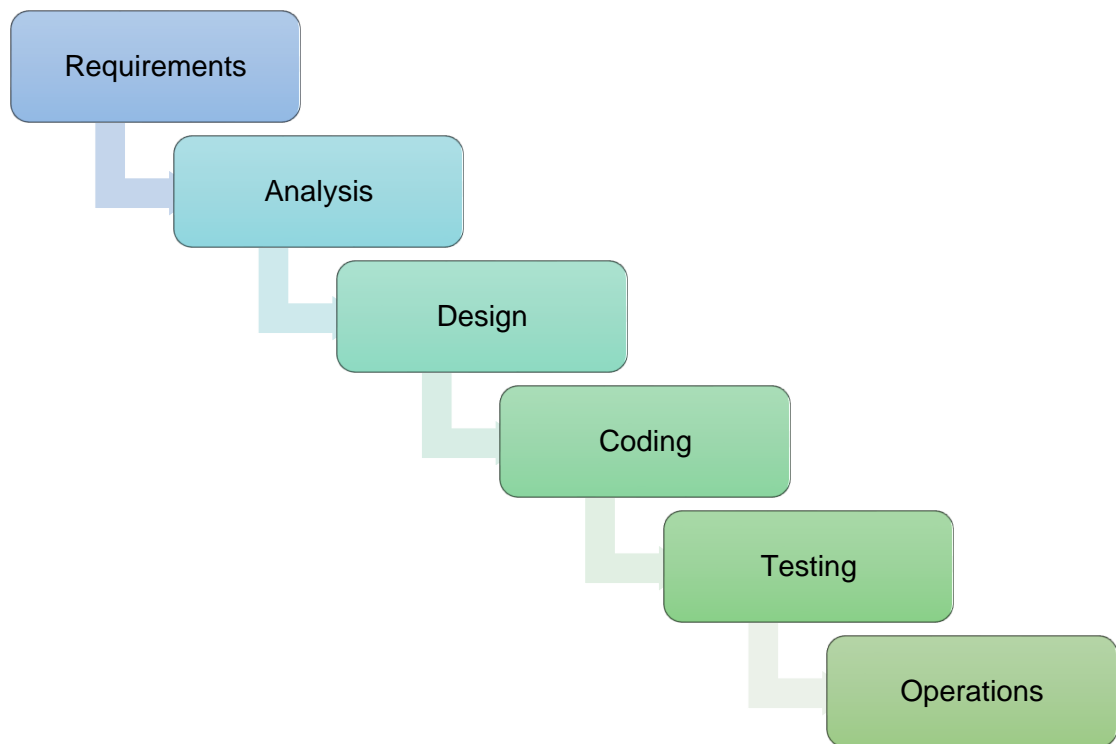
Figure 1: The Waterfall Model

The Waterfall Model encompasses six processes that are followed throughout the development.

Requirements. In this phase, the necessary pieces of information are gathered from the client. This information will serve as the specification that needed to be followed by the system.

Analysis. The information gathered at the Requirements phase is thrown into the analysis stage of the study. The specifications will be analyzed in order to come up with a possible model and workflow for the system. At the end of this phase, the logical process of the system is produced.

Design. Technical requirements are provided in the Design phase. Specifications such as the programming language to use, the tools to be incorporated, the services to be used, and more will be specified at this phase.

Coding. The source code for the system is finally written. Using the produced outputs from the earlier stages, the code is built from the ground up. Each specification will be used and implemented while creating the source code for the system.

Testing. Once the writing of source code is finished, it is important to see whether it is fully functional or not. This is where the Testing phase kicks in. The system will be tested by various testers. Testers will report any issues that needed to be resolved, such as bugs, performance issues, and more. Once the issues are identified it is common to go back to the coding phase and eliminate these issues in the system.

Operations. This will be the last phase of the model. At this point, the system is ready for deployment to a working environment. The process does not stop at the deployment, since maintenance is also a part of this. Maintenance will be done as a regular checkup and update to the system. This ensures the functional state of the system.

Significance of the Study

The development of a Two-Dimensional Game Application about Driving Fundamentals and Courtesy and Safety of Municipality of Bacoor is believed to be beneficial to a certain individual, group of individuals, or organizations.

Bacoor Traffic Management Department. This study is significant to the department of Traffic Management Office as it will disseminate information with regards to Road Safety and Driving the citizens of Bacoor City in an innovative and entertaining platform.

Aspiring Drivers. This study is significant for aspiring drivers for them to have a portable, useful yet entertaining source of knowledge about Road Safety and Driving. Furthermore, it will help them to familiarize themselves with Traffic Rules and Regulations especially the Bacooreños.

Cavite State University – Bacoor City Campus. This study is significant to the university as it will be recognized to be a part of the development of having an application for Road Safety and Driving.

Driving Schools. This study is significant to schools that educate aspiring drivers. It can help them in introducing basic Traffic Rules to driving applicants with the use of an easy and entertaining platform.

Local Government Institutions. This study is also significant to other Local Government Units as an inspiration to develop their own application pertaining to Road Safety and Driving or the likes

Researchers. This study is important to the researchers as they will gain more knowledge about developing an android application and about Road Safety and Driving. Moreover, it will help them to enhance their skills in developing a game application and aid them in their professional career in the future.

Future Researchers. The study is also important to future researchers and developers as it can be of help to become a groundwork in developing a new application relevant to the concepts of the system or serve as a related study for their manuscript.

REFERENCE LIST

About Cavite Province. (n.d.). Retrieved from Wayback Machine: https://web.archive.org/web/20070311051458/http://www.cavite.info/cavite.php?id=13#5

Bacoor Traffic Management Department. (2017, June 27). *Bacoor Traffic Management Department | Bacoor Government Center*. Retrieved from Bacoor Government Center: https://bacoor.gov.ph/bacoor-traffic-management-department/

Banks, F. (2021, January 21). *Waterfall Model: What Is It and When Should You Use It?* Retrieved from Airbrake: https://airbrake.io/blog/sdlc/waterfall-model

Caguete, M. V., Sabela, B. C., Menis, L. P., & Garcia, A. L. (2018). *Filipino Driver's Manual 2018* (Vol. 1). Land Transportation Office. Retrieved from https://lto.gov.ph/images/Transparency/Volume_1.pdf

Center for Health Development Calabarzon. (2019, September 4). *CALABARZON RECORDS HIGHEST TRANSPORT VEHICULAR CRASH*. Retrieved from Center for Health Development Calabarzon: https://ro4a.doh.gov.ph/media-releases/140-featured-article/629-calabarzon-records-highest-transport-vehicular-crash

eFOI - Electronic Freedom of Information - Request. (2021, February 17). Retrieved from Electronic Freedom of Information: https://www.foi.gov.ph/requests/aglzfmVmb2ktcGhyHQsSB0NvbnRlbnQiEExUTy05NTE3NDkwNzcxNzAM

PhilAtlas. (n.d.). *Bacoor City, Cavite Profile – PhilAtlas*. Retrieved from PhilAtlas: https://www.philatlas.com/luzon/r04a/cavite/bacoor.html#sectionBrgys

Philippine Statistics Authority. (2016, June 2). *Population of Region IV-A - CALABARZON (Based on the 2015 Census of Population)*. Retrieved from Philippine Statistics Authority: https://psa.gov.ph/population-and-housing/title/Population%20of%20Region%20IV-A%20-

%20CALABARZON%20%28Based%20on%20the%202015%20Census%20o

f%20Population%29

Pino, G. (2019, August 29). *DOH Calabarzon kicks off 'road safety' training for LGUs*. Retrieved from Philippine News Agency: https://www.pna.gov.ph/articles/1079065

Republic Act No. 4136 | GOVPH. (1964, June 20). Retrieved from The Official Gazette: https://www.officialgazette.gov.ph/1964/06/20/republic-act-no-4136/

Safe driving essays. (n.d.). Retrieved from MegaEssays: https://www.megaessays.com/viewpaper/5255.html

Wikipedia contributors. (2021, April 2). *Bacoor*. Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Bacoor