

Home-bro: Android-Based Students' Housing Locator and Monitoring System

Mary Anne M. Sahagun, Jun P. Flores

Abstract: A dynamic android application was made providing apartment locating services for the students. Being connected into a database, universities can monitor current tenancy of the students. The project was made to aid the university's lacking field in terms of support to students pertaining to housing services. Hybrid coding was utilized to make the application responsive to almost all smart devices. Upon testing, the application displayed a total roundtrip data consumption of 195.2Kb, disk usage of 5.78MB, and an average ram usage of 132.84MB. Using multiple statistical tools including Pearson's Correlation and Single-Factor ANOVA, it has been found that the application was better compared to similar application in terms of data consumption, ram and disk usage, and response time. Also, it has been found that there had been a significant difference in the students' time to find an apartment upon accomplishment of the project.

Keywords: android, database, hybrid coding, tenancy

I. INTRODUCTION

Students preparing for tertiary level often times find difficulty in adjusting. Selection of University or Colleges had been one of their tough times in decision making. Added to this is looking for suitable dormitories or temporary dwellings, ideally near the school.

Educational environment help the student achieve full development, as stressed on Student Development Theory (Brilliantes, R., 2012). This theory covers acquiring a good night sleep, receiving necessary nutrients and staying free of life threatening illnesses or injuries (Clarkson, S., 2006), affects emotional, social, physical and intellectual being well being (De Larossa, L., unpublished), all stages of development (Kane, T.L., 1990).

The support of the government to meet the total growth development of students, staying or dwelling in apartments, boarding houses, renting rooms include: a Commission on Higher Education (CHED) mandate schools to have student housing and residential services; provide mechanism, assistance and/or list of acceptable student dormitories and housing facilities that are safe, clean, affordable, accessible to students and beneficial to learning (CMO 9, 2016).

The output of the first-hand data shows that students of Don Honorio Ventura Technological State University consumes time and effort in searching for boarding houses, apartments or room for rent. Factors that contribute to this difficulty are: lack of proper advertisement from boarding houses, rentals are in remote areas, and lastly, lack of proper assistance from school. In a released statement of Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACUP) during the conduct of Survey

Visit in 2015, one of the recommendation under the Area of Student Services and Physical Plant and Facilities was to do something that will help the students in finding a suitable and safe place for them, if the university cannot offer housing or residential services .

At present the university has four campuses namely: Main Campus in Bacolor, Porac Campus, Sto. Tomas Campus and Mexico Campus. The main campus, it caters students residing from distant places as far as Nueva Ecija, Bataan, Arayat, Macabebe, Madapdap, and Lubao. The number of enrollees of the university increases every year. In the school year 2016-2017, the number of enrollees reached 17,111 for the first semester and for the College of Engineering and Architecture (CEA) alone, it reached 5,059 enrollees for the second semester of 2016.

With these growing number of students coming from different distant places, there is a need for the university to have a scheme that is suitable in managing the university's students housing and residential services.

A housing locator service should allow people to locate available housing that best fits their individual needs. At present, there are locators available in a form of a mobile applications specialized in internet-related services products in hotel, lodging and meta search fields such as trivago, HotPads, and Zumper. These mobile applications are common outside the country and are mainly used by professionals. In this study, the proponents intend to develop a similar mobile application intended for the students, university and local rent owners. Unlike the above mentioned services, the study is able to provide monitoring status for each registered student tenants.

II. PROBLEM STATEMENT

The growing number of students coming from different distant places, implicates a need for the university to have a scheme that is suitable in managing the university's students housing and residential services. Specifically, the university's inability to monitor the tenants for each legitimate boarding house, the need to identify information on legit boarding houses or temporary dwelling place for its students is necessary.

III. THE AIM OF RESEARCH

The study intends to assess and to design a suitable system that will nurture the university's housing and residential services. Specifically, it aims to identify a system that can monitor the students current tenancy , to design and

Revised Manuscript Received on February 14, 2019.

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develop graphic user interface that displays the boarding house's location, price, ratings, and feedbacks from previous occupants.

IV. METHOD OF RESEARCH

The proponents considered the initial condition in finding an apartment with respect to time. Using the Pearson's R analysis, with a factor of 0.56, confirms a moderate positive correlation between the students' time to find an apartment and its distance from the university. Second, the primary considerations of the students in finding a suitable dormitory or apartment was categorized as follows: location, price, capacity, furnishings, feedbacks and safety. The data collected served as an input to the proposed user's application. Lastly, since the study is a mobile application the proponents considered to test the existing internet speed versus average task for a smart phone.

The developed application had used the following hardwares : Arduino Mega-5V, 54 I/O pins, 40mA, clock speed of 16Mhz, Relay Module – 5V, GSM module-frequency range of 76-109 Mhz, 3.4-4.3V, controlled via AT commands, sim card of different network, arduino nano -5V, 13 I/O pins & internet server had been utilized for 6 months.

The researchers used Android Studio for the development of the android application. The use of AT commands was utilized to make the SIM800L GSM module work. Considering both the response time of the device and cost, the researchers chose to use Smart as the network provider for the device. The researchers used the hybrid coding scheme for the development of both the users and the operators' application for convenience, quick response, and deployment.

V. RESULTS AND DISCUSSION

There were only fourteen registered boarding houses, apartment or temporary dwelling in the Municipality of Bacolor which have the legal requirements by the local government unit. The farthest boarding house of 1 km was able to locate in a span of 0.25-0.5 day. If compared with the initial investigation, it will take 15 days for a student to locate the same boarding house as seen in figure 1 .

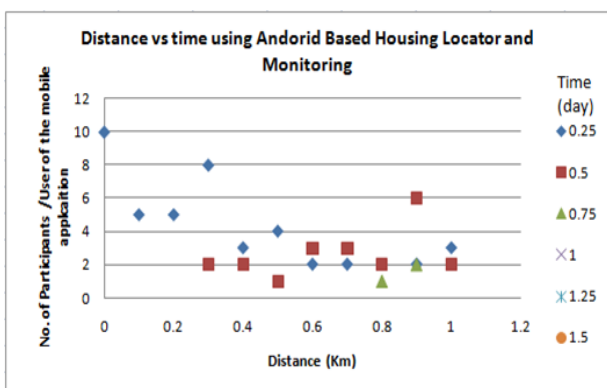


Figure 1 Time consumption using Hombro

Compared to Trivago and Hotpads, HomeBro consumes less average RAM usage. This usage will partially affect the response time . In terms of signal strength that is vital for the system, among four cellular networks that has been tested,

Smart stood out because of having the signal strength of -81.58dBm as seen in figure 2.

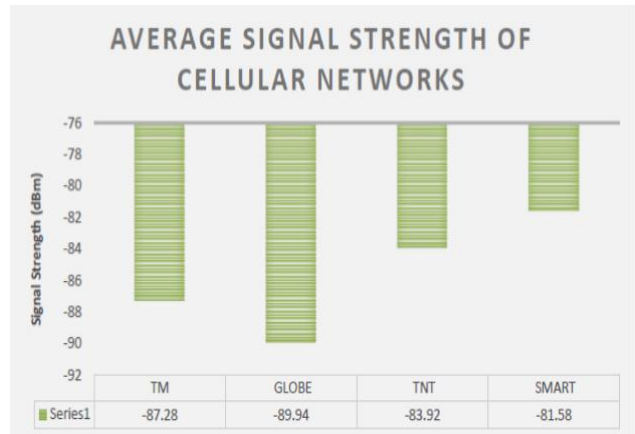


Figure 2. Signal strength test of cellular networks

Homebro have less data consumption. Based on analysis done on these similar android applications, aside from the number of hotels these applications store in their respective database, access to featured photos of the hotels also affect the data consumption on these websites. The system developed however uses filtered picture to limit data consumption.

The system consists of three levels of access: administration, student's applications and the operator's applications as shown in Figure 4. The administration controls and keep the records on all the activities in the system, can add or remove the apartments or housing units in the list of its legitimate partner apartments or housings for rent students.

Upon loading on the application, it fetches initial information of the apartments listed in the database. It includes names, apartment's map view with geographical coordinates as seen in figure 3. Upon clicking into the list buttons on the GUI, the application sends request into the SQL server which displays all data available or administration recommended information. Once the list is loaded, it displays primary information of every apartments including its name, display photo, and advertising price.

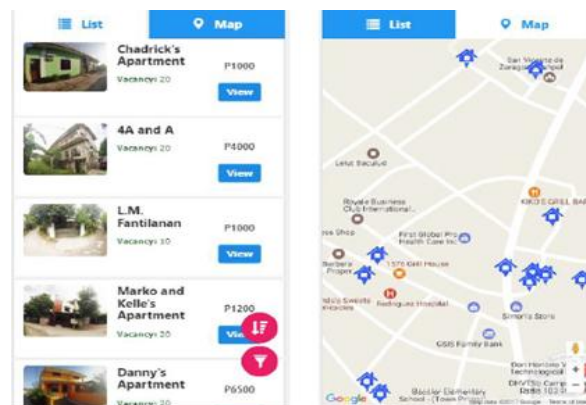


Figure 3. Graphic User Interface of Homebro displaying boarding house rentals, fees, locations and amenities.



The user has the choice to view the details of an apartment, this includes its description, ratings and feedbacks, location, operator’s contact information, and price description. On the details section of the application, the students can post a comment and rating about the said apartment by clicking onto the add comment button under feedback section as seen in figure 4. Upon doing so, the system checks on the identity of the user if he or she is a current tenant on the said apartment.

It has input text-boxes that enables the landlords or landladies to insert the students’ id number, name, and contact number into the university’s database. Upon clicking on the update button on the GUI, the application will send an insert request into the server to include the said student into the database. This in turn updates the university’s administration about the current residency of the students living in dormitories or apartments. The landlords can also update the number of vacancies on their establishment.

Only the admin can view the information on all the students currently or formerly boarding in a certain establishment, including the reason why students stay in a particular unit has been terminated as seen in figure 5 and 6.

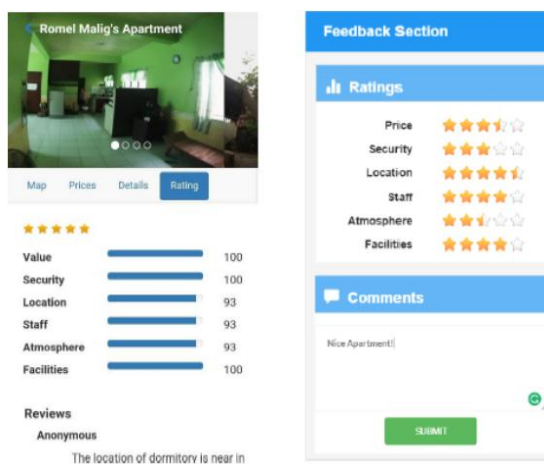


Figure 4. Filter Model. GUI displaying the feedback section and ratings.

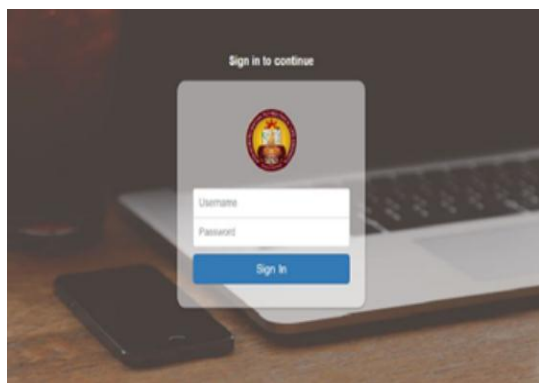


Figure 5. Administration Section Log-in

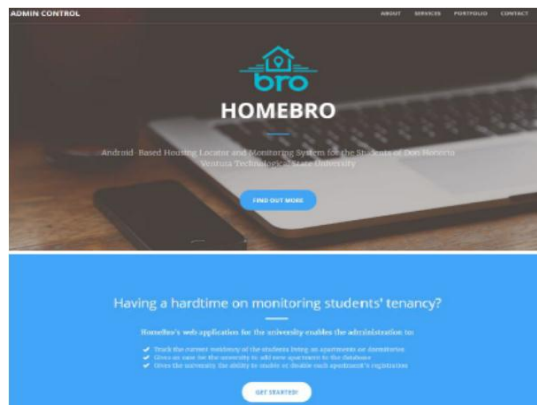


Figure 6 GUI Administration control

Results for clock speed, RAM, core number, and the amount of data being fetched, together with the internet speed, gave p-values of -0.918, -0.872, -0.272, 0.499, and -0.99 respectively. The smart phone’s clock speed and RAM showed a strong negative correlation, while its core number showed a low negative correlation. This means that, as these smart phone’s specification increases, the probable response time of the application decreases. Amount of data consumption showed a moderate positive correlation, meaning, as stated earlier, as the amount of data consumption increases, the response time of the application decreases.

VI. CONCLUSION

The study helps the university administration provide students pertinent information about boarding houses, apartments or rooms they can avail. Results show that, using HomeBro, there is a significant difference between the conventional way of finding an apartment and through the use of HomeBro.

HomeBro consumes an average roundtrip data consumption of 195.2Kb, disk usage of 5.78MB, and an average RAM usage of 132.84MB, making it better than Trivago and Hotpads, android applications that are uses the same technology as HomeBro. Final survey results showed that the user acceptability of HomeBro in terms of its operability,learnability, understandability, and effectiveness of the application was satisfactory. It yielded an average acceptability greater than 90 %. Overall, the system developed met its objectives and can be considered effective as an aid for the university’s housing and residential services as recommended by CHED and AACCUP.

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