



JOSSTED

JOURNAL OF SOCIAL SCIENCES
AND TECHNICAL EDUCATION

The Development of Class Location Finder Application: Case Study of Politeknik Kuching Sarawak

(Pembangunan Aplikasi Pencari Lokasi Kelas: Kajian Kes Politeknik Kuching Sarawak)

*MUHAMMAD FIRDAUS AMINUDDIN, HELMI ABD KADIR, MUHD NAZMI ISMAIL
Civil Engineering Department, Politeknik Kuching Sarawak, Malaysia

* Corresponding author: aus89ygzutm@yahoo.com.my

ARTICLE INFO

Article History:

Received 15.08.2022

Accepted 11.10.2022

Published 22.11.2022

Abstract

The number of various types of navigation system applications has been increasing nowadays with the demand from users. The use of navigation system applications depends on the purpose of the product. There are quite several products available in the market such as location navigation, hiking routes, marine navigation, etc but for specific places' navigation is not available. All the above navigation system application uses the Global Navigation Satellite System (GNSS) to determine the location position while using the Geographic Information System (GIS) for the spatial and attribute data. This study focuses on developing a navigation application for navigating users to locate classes in Politeknik Kuching Sarawak. The targeted users for this study are students and lecturers as the main customers. The main components of this application are the integration of class location databases and open-source map features for route navigation. This study involved collecting the class accommodation details as attribute data in combining GIS with GNSS components. This study introduced a wide variety and diversity of navigation applications but only focused on locating classes at Politeknik Kuching Sarawak. To realize this type of navigation application, a well-planned methodology has been carried out. First, carried out the data acquisition and data preparation for the class coordinates and accommodations. Then, the application was developed using JotForm software. After that, the app installation link was shared with several respondents to test the app. The respondents will give their feedback through a distributed google form so that the developer can analyse the effectiveness of the application and will be able to improve the application update in the next version.

Keywords: Global Navigation Satellite System (GNSS), Geographic Information System (GIS), navigation application.

INTRODUCTION

A mobile app is a software application developed specifically for use on small, wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers. Apps were originally intended for productivity assistance such as email, calendar, and contact databases, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, Global Navigation Satellite System and location-based services, order tracking, ticket purchases, etc. Nowadays, there are millions of apps available in the app store, which is a type of digital distribution platform.

Real-time navigation deals with moving objects, trajectory determination and guidance in real-time. The regular use of the term 'routing and guidance is to define the appropriate routes to the desired location. Navigation acts as a guide leading us to our destination [Freddy, 2008]. Nowadays, the information explosion and the advancement of technology, and the importance of global positioning and location determination awareness is becoming a significant feature in routine life (Firdaus, 2018). The use of satellite-based navigation systems such as the Global Navigation Satellite System (GNSS) is getting popular to determine positions, especially using navigation applications (Firdaus, 2018). Modern navigation technology has become an attractive means for assisting people with their navigation needs and preferences, and since its inception (the mid-1980s) the demand for it has sharply increased (Hassan, 2011).

Class location finder means the app will help the user by showing a map that contains the class location and their current position. In this study, the name of the developed app is "Locate MyClass POLIKU" version 1.06.07.2022. This study focuses on creating an application navigation app to help students and lecturers to locate their class location as well as show the class accommodation information. From this study, the expected result is the success of app product installation and usage by the users.

CURRENT NAVIGATION FACILITIES ON CAMPUS

Politeknik Kuching Sarawak (PKS) is a public institution under Kementerian Pengajian Tinggi (KPT) which is located at Kuching Sarawak. The campus areas are so big approximately 456400 square meters which are covered by forest, landscaping, and building. There are eight academic departments on campus which have many classrooms, laboratories, lecture halls and discussion rooms to support teaching and learning activities. Now, PKS are still using the conventional method whereby most of the information about the class's location is only available on paper, maps displayed on the noticeboards and searched manually. Because of this, one of the impacts of using the old method is many students and lecturers from different departments are often lost because they do not know about the info provided. Hence, due to a lack of information, finding the location of the classes is challenging. Therefore, this will cause problems such as being late to class, wasting time and missing the lecture session.

METHODOLOGY

Realizing this study, Figure 1 shows the methodology flow chart to give a big picture of how the study is carried out.

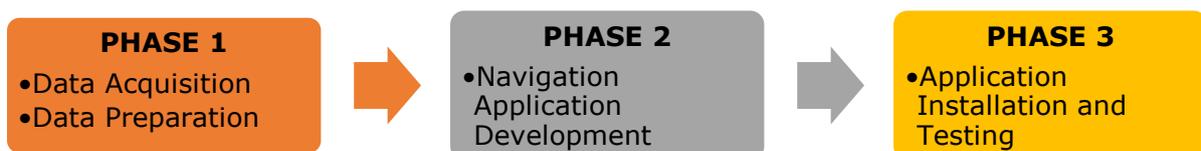


Figure 1. Methodology of study flow chart

DATA ACQUISITION AND DATA PREPARATION

Before doing data collection, we identified which building will be our sample. Figure 2 shows the location of the study in the Politeknik Kuching Sarawak campus. The highlighted building is our study sample to develop the navigation application.



Figure 2. Highlighted study location sample in PKS

There are two types of data collected for this project which are spatial data and attribute data. Navigation systems need a lot of detailed and dedicated geographical information (Ivan, 2007). The spatial data involves the coordinates of the class's location while the attribute data involves the classes name, class coordinate, class capacity, and class accommodation. The spatial data were collected using 'GPS Test' android mobile applications as shown in Figure 3. As for the attribute data, all the information was collected manually and compiled in an excel sheet as shown in Figure 4.

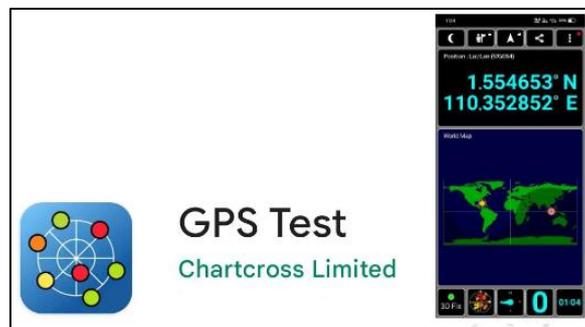


Figure 3. GPS Test Apps to collect spatial data

Class Name	Latitude	Longitude	Floor
C-Mgmt1	01.552851	110.352851	01
C-Mgmt2	01.552851	110.352851	02
C-Mgmt3	01.552851	110.352851	03
C-Mgmt4	01.552851	110.352851	04
C-Mgmt5	01.552851	110.352851	05
C-Mgmt6	01.552851	110.352851	06
C-Mgmt7	01.552851	110.352851	07
C-Mgmt8	01.552851	110.352851	08
C-Mgmt9	01.552851	110.352851	09
C-Mgmt10	01.552851	110.352851	10
C-Mgmt11	01.552851	110.352851	11
C-Mgmt12	01.552851	110.352851	12
C-Mgmt13	01.552851	110.352851	13
C-Mgmt14	01.552851	110.352851	14
C-Mgmt15	01.552851	110.352851	15
C-Mgmt16	01.552851	110.352851	16
C-Mgmt17	01.552851	110.352851	17
C-Mgmt18	01.552851	110.352851	18
C-Mgmt19	01.552851	110.352851	19
C-Mgmt20	01.552851	110.352851	20
C-Mgmt21	01.552851	110.352851	21
C-Mgmt22	01.552851	110.352851	22
C-Mgmt23	01.552851	110.352851	23
C-Mgmt24	01.552851	110.352851	24
C-Mgmt25	01.552851	110.352851	25
C-Mgmt26	01.552851	110.352851	26
C-Mgmt27	01.552851	110.352851	27
C-Mgmt28	01.552851	110.352851	28
C-Mgmt29	01.552851	110.352851	29
C-Mgmt30	01.552851	110.352851	30
C-Mgmt31	01.552851	110.352851	31
C-Mgmt32	01.552851	110.352851	32
C-Mgmt33	01.552851	110.352851	33
C-Mgmt34	01.552851	110.352851	34
C-Mgmt35	01.552851	110.352851	35
C-Mgmt36	01.552851	110.352851	36
C-Mgmt37	01.552851	110.352851	37
C-Mgmt38	01.552851	110.352851	38
C-Mgmt39	01.552851	110.352851	39
C-Mgmt40	01.552851	110.352851	40
C-Mgmt41	01.552851	110.352851	41
C-Mgmt42	01.552851	110.352851	42
C-Mgmt43	01.552851	110.352851	43
C-Mgmt44	01.552851	110.352851	44
C-Mgmt45	01.552851	110.352851	45
C-Mgmt46	01.552851	110.352851	46
C-Mgmt47	01.552851	110.352851	47
C-Mgmt48	01.552851	110.352851	48
C-Mgmt49	01.552851	110.352851	49
C-Mgmt50	01.552851	110.352851	50

Figure 4. Class information and accommodations in Excel Sheet

NAVIGATION APPLICATION DEVELOPMENT

This application was generated and developed using Jotform software. Jotform is a free no-code app builder that lets you add your forms, links, widgets, and branding to one fully customized app that can be downloaded to your smartphone, tablet, or computer. Therefore, this software is suitable for our study to develop "LocateMyClass POLIKU" version 1.06.07.2022. The generated publish link by Jotform to install "LocateMyClass POLIKU" version 1.06.07.2022 is universal as it is not limited to android or IOS only.

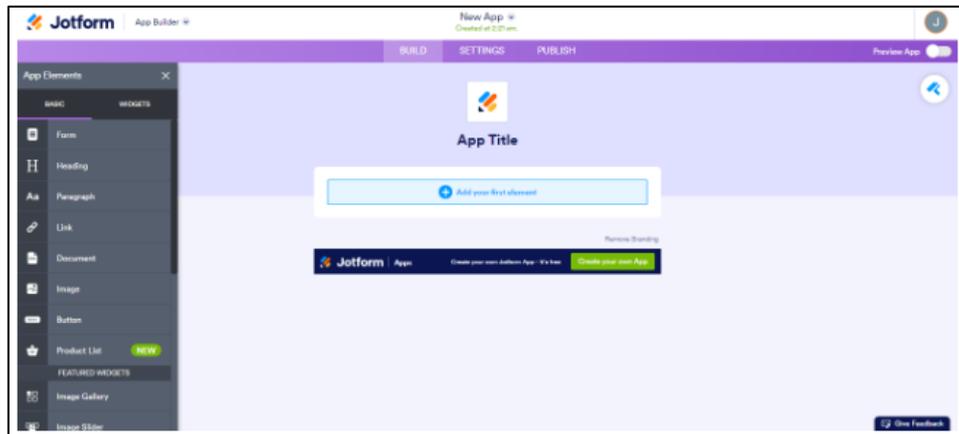


Figure 5. Jotform user interface

APPLICATION INSTALLATION AND TESTING

The final phase for this study is to install "LocateMyClass POLIKU" version 1.06.07.2022 on a mobile phone or open the link with a web browser. Figure 7 shows our official app logo for this study.



Figure 6. LocateMyClass POLIKU Logo and installation link

The final output for this study is the installation link generated by the software. Below is the official link for the app which can be opened by using any mobile phone or web browser.

Installation link: <https://www.jotform.com/app/221537066428457>

Figure 7 shows the successful developed class location finder application using Jotform software. The app was tested functional and ready to use.

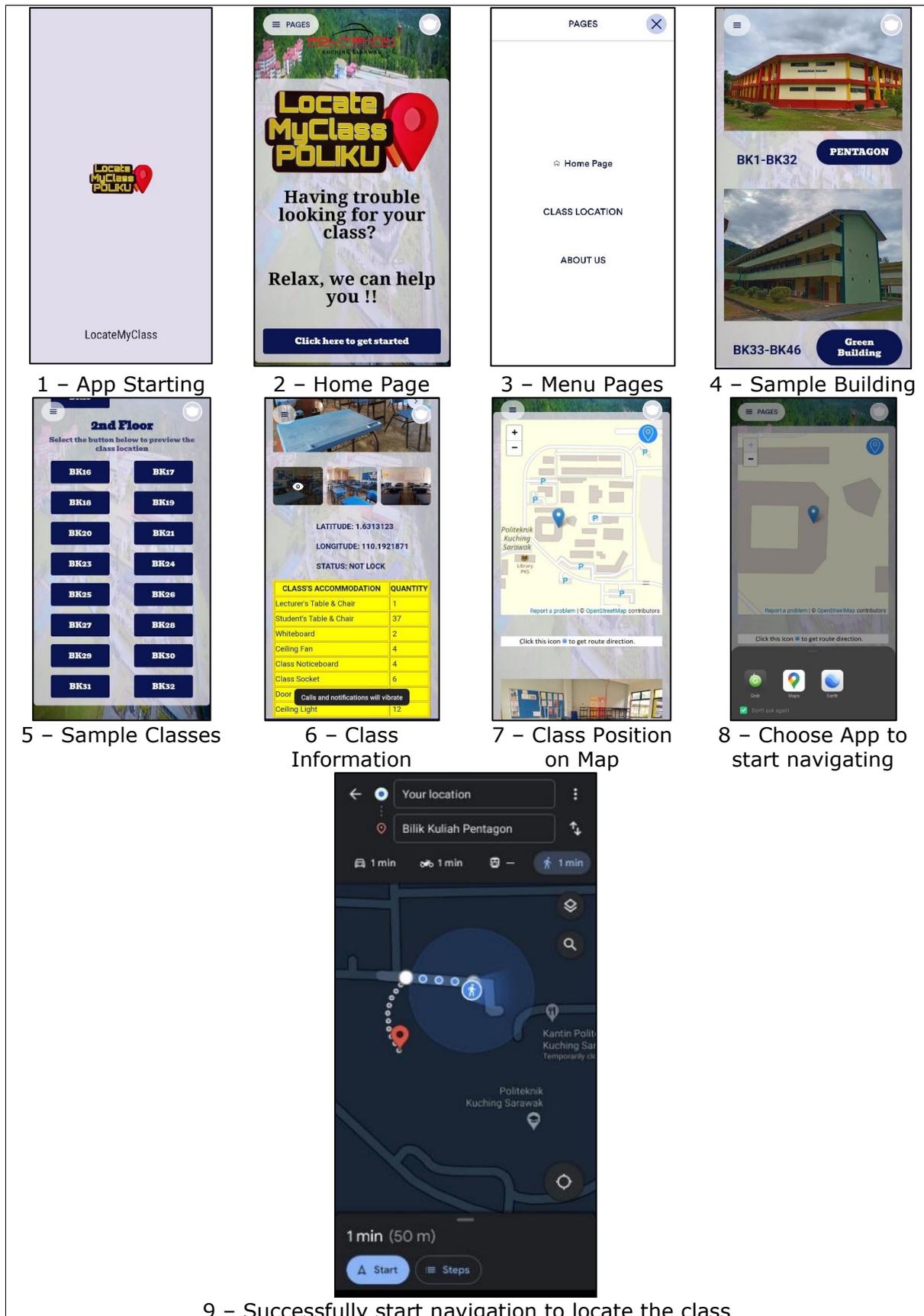


Figure 7. Successful developed and tested LocateMyClass POLIKU

RESULT AND ANALYSIS

To evaluate the effectiveness of the developed applications, we have distributed simple questionnaires to the students and lecturers through google Forms to see their responses from them. These obtained responses can be used by the developer to update and improve the app in the future. Table 1 shows the overall analysis response by 30 responses app users.

Table 1. Overall analysis response by 30 responses app users

No.	Questions	Do not agree	Agree	Strongly Agree
1	Is this application easy to use?	0.0%	36.7%	63.3%
2	Is this app very helpful to you?	0.0%	36.7%	63.3%
3	Whether this application is suitable for PKS students and lecturers?	0.0%	50%	50%
4	What is your level of satisfaction with this application?	0.0%	53.3%	46.7%

From Table 1, all the responses give a good feedback about this study. It is shown that navigation applications for class location finders are important nowadays and conventional mapping methods in hardcopy are not practical.

CONCLUSION

This study gives the conclusion that navigation application is the easier way to locate classes in Politeknik Kuching Sarawak. This is because the use of the Global Navigation Satellite System (GNSS) and Geographic Information System (GIS) has a very powerful function that can support the development of navigation applications. In addition, GNSS is to serve as a navigation aid to the users in Politeknik Kuching Sarawak.

REFERENCES

- Freddy Ng Wei Siang (2008). *Towards the development of Universiti Teknologi Malaysia Real-Time Navigation System*. Universiti Teknologi Malaysia, Skudai.
- Hassan A. Karimi (2011). *Universal navigation on smartphones*. United States of America: Springer US. Retrieved from: http://link.springer.com/chapter/10.1007/978-1-4419-7741-0_1
- Ivan Spassov. (2007). *Algorithms for map-aided autonomous indoor pedestrian positioning and navigation*. (Unpublished doctorate theses). University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria.
- Muhammad Firdaus Aminuddin (2018). The development of water house navigation with Garmin handheld global positioning system. *Prosiding Kenyalang National Geomatic Colloquium 2018*. Politeknik Kuching Sarawak.