IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Bit Campus Navigation: A Smart Guide to Seamless Campus Movement.

"BIT Campus Smart Guide: Improving Movement with Innovative Technology"

[1]Swati Bandu Bambode, [2]Priti Sandip Bhute, [3]Menka Nujkumar Dewangan, [4]Muskan Roshan Sayyad, [5]Maheen Yousufuddin Quazi

[1,2,3,4]Student, [5]Assistant Professor

[1,2,3,4] Department of Computer Engineering,

[1,2,3,4]Ballarpur Institute of Technology, Bamni, Chandrapur, India

Abstract: A user-friendly Android Application, Named BIT Campus Navigation App, has been developed for the convenience of guests, faculty and students for the BIT College. This app provides plain and simple information to help you to search the building, room or office you are looking for. It will show accurate directions all thanks to Google Maps integration, satellite display and clearly marked boundaries of this campus. It will give clear directions using google maps with the app, users can easily find particular rooms, labs, offices, etc. An Android based easy mobile application BIT Campus Navigation is specially developed for the visitors, faculty and students for BIT College. This app gives simple, information about the campus which allows you to find the building, room or offices labs you're looking for. We can search for contacts, rooms, labs, offices and other information which we are needed. That would be because it was written in Kotlin, and Jetpack Compose.

Keywords - BIT Campus Navigation, Android App, Campus Navigation, Visitors, Google Maps Integration, Satellite View, Kotlin, Jetpack Compose.

I.INTRODUCTION

This app uses Google Maps with satellite view so users can explore the entire campus area with high accuracy. It also set campus boundaries, so you can sure that you're looking at the right campus map.

Users can search for anything on campus – like departments, classrooms, offices, or even the cafeteria – and see exactly where it is. The app also shows floor-wise layouts of buildings so it's easy to understand what's were inside, not just from the outside.

But the app doesn't stop at just directions. It also gives you access to important contact numbers – like admin offices, emergency services, and other useful campus services – so user can easily get help when it needed.

BIT campus navigation is built using Kotlin and Jetpack Compose. It's designed to be easy to use for everyone – whether you're a fresher, a faculty member, or just someone visiting the campus for the first time.

The best part is real time navigation feature. No matter where you are on campus, it shows your current location and helps you get to your destination without confusion. You don't have to ask anyone or get lost again.

You can also search for specific rooms or facilities, and the app will take you right there. It saves time and makes life easier.
The app also helps people stay connected and informed. Whether you need to call campus security, find the health centre, or contact an admin office, everything is available in the app.

With its fast performance and modern features, BIT Campus Navigation is more than just a map – it's a helpful tool daily use on campus life.

II. AIMS AND OBJECTIVES

Aim:

The BIT Campus Navigation system helps students, staff, and visitors use a digital map or app to easily find their way around the campus.
Objectives:

1.Easy directions: Guide users reach buildings, classrooms, labs, offices, and other important places on campus.

2. Save time: Show the shortest and fastest path so user don't get lost or waste time

3. Easy to use: Make the app simple to use everyone, even for those people who don't use mobile applications.

4. Real-time updates: Show current information such as closed roads, or any route changes.

5. Accessibility: Make sure people with disabilities can also use the app easily to move around campus.

6. Better campus experience: Easier for visitors and new students or parents to find their way and save their time on campus.

III. RESEARCH METHODOLOGY

1. Requirement Analysis

- A survey and informal interviews were conducted with students and faculties of Bharat Institute of Technology (BIT) to understand the common navigation challenges faced within the campus. Major requirements include:
- Easily use mobile interface
- Exact location tracking
- Step by step guidance
- Including academic blocks, hostels, laboratory, canteens and other features

2. System Design

- Depending on the collected requirements, the system architecture was designed. It consists of the following components:
- Frontend: A mobile application was developed [Android Studio / Flutter]
- Backend: Firebase / SQLite / Custom Server for Location Data and User Requests Management
- Mapping Service: Integration with Google Maps API or OpenStreetMap for outdoor navigation
- Indoor navigation (optional): Use of QR Code or Wi-Fi Access Point Triangulation for assistance under building guidance

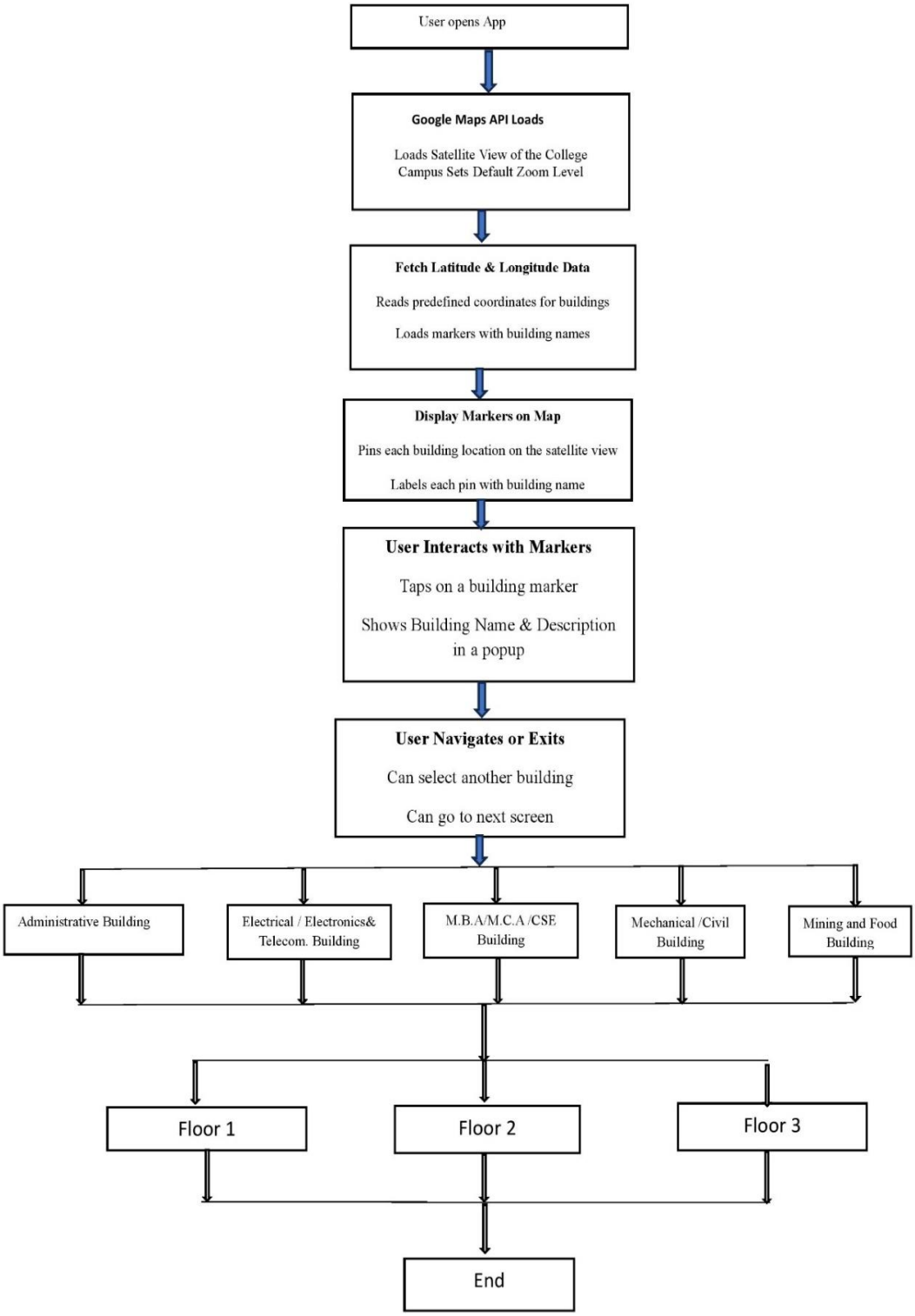
3. Data Repository

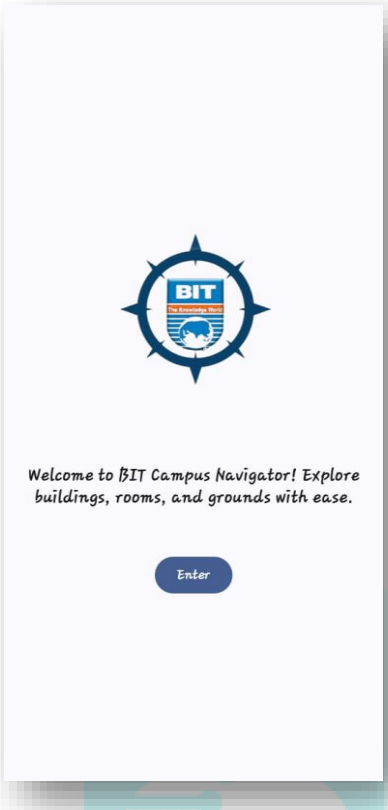
- The campus map was digitized by collecting GPS coordinates of prominent places (buildings, classes, laboratories, etc.). The data through the existing digital infrastructure was either manually mapped or sour.

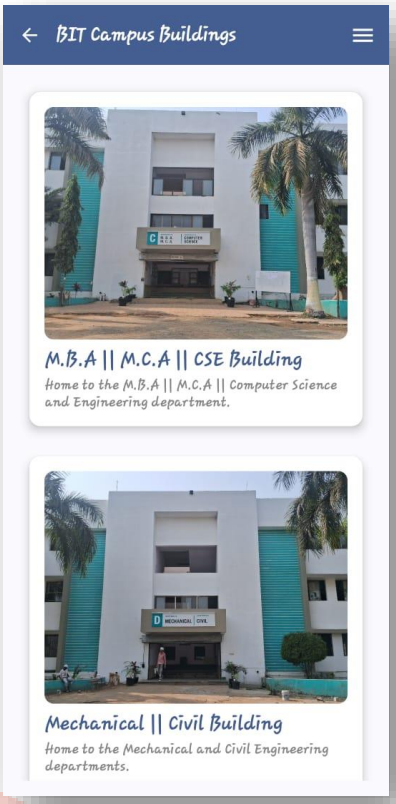
4. Applications Development

- Mobile application was developed in re-corrected cycles using agile functioning:
- Prototype Development: Early UI and Navigation Facilities

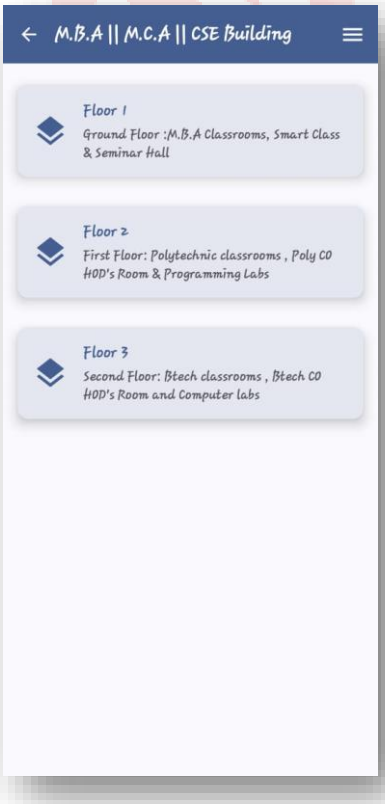
IV. FLOWCHART

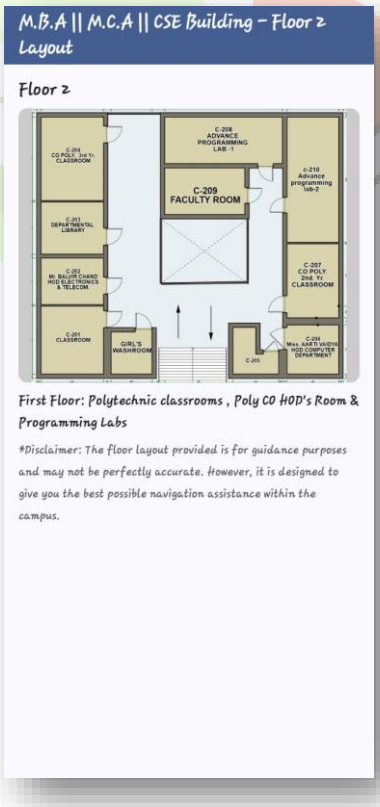


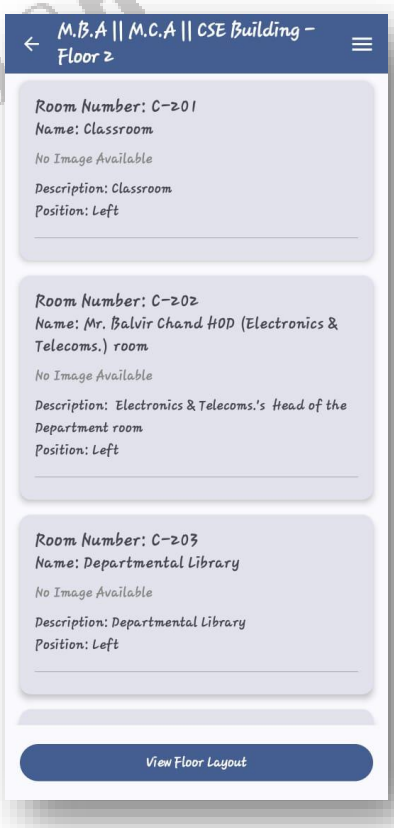


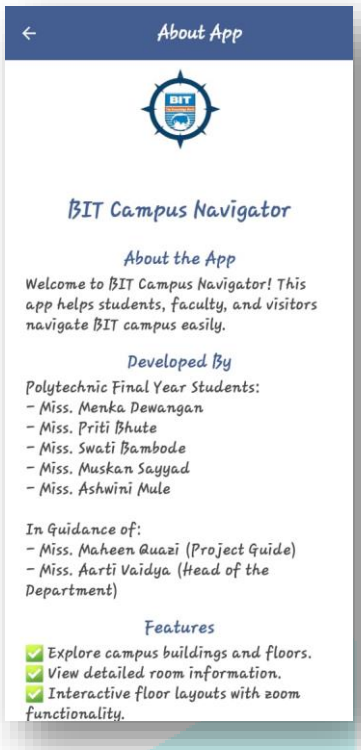


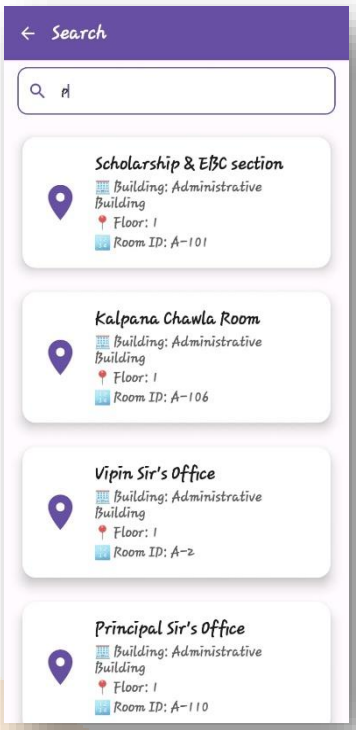
V.RESULTS AND DISCUSSION

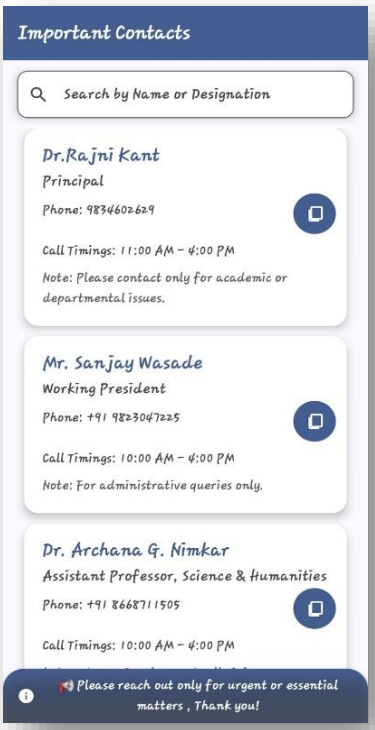












VI. ACKNOWLEDGMENT

I would like to express my sincere gratitude to all those who helped me navigate and familiarize myself with the BIT campus. My heartfelt thanks go to the faculty, staff, and fellow students who provided valuable guidance and support during this experience.

Special thanks to the administration for maintaining clear signages and providing detailed campus maps, which greatly aided in understanding the layout and locating key departments, lecture halls, hostels, and other facilities. This navigation experience not only helped me become more confident and independent on campus but also enhanced my sense of belonging in the BIT community

I deeply appreciate the assistance extended to me and look forward to continuing my journey at BIT with greater ease and enthusiasm.

VII. CONCLUSION

BIT Campus Navigator is an exhaustive and user-friendly mobile application aimed at guiding students, teachers, and guests around the BIT campus in a timely manner. The app includes information on buildings, rooms, offices, and notable landmarks inside the campus. The app includes Google Maps, interactive floor maps, and guided navigation features to deliver accurate location-based guidance to allow users to navigate to their target locations effortlessly.

This application was designed to solve the typical problems encountered by students and guests, including inability to find classrooms, administrative offices, laboratories, libraries, and other important facilities. With the inclusion of guided search functionality, category-based browsing, and simple UI design, the app provides a seamless user experience. The building and floor choice system enables users to view detailed floor maps with room names and locations, which facilitates easier navigation within buildings.

The successful development and utilization of the BIT Campus Navigator had several phases, including system design, development, and severe testing. The outcomes proved that the application significantly improves campus navigation, eases confusion, and enhances accessibility.

With the prospects for future updates, including indoor GPS-based navigation, voice guidance, AI-powered recommendations, real-time events on campus updates, and augmented reality-based pathfinding, the BIT Campus Navigator can grow to be an intelligent campus solution. These would be additional factors for increasing user involvement, ease of access, and efficiency, making the application an essential component for both prospective and current members of campus life.

The BIT Campus Navigator is a well-designed and needed software that greatly enhances campus accessibility and navigation. It facilitates the connection between students and campus facilities, making it easy for users to navigate and find locations within the institution. The project is a technological innovation in campus management, leading to a smarter and connected learning environment.

VIII. REFERENCES

[1] Yogesh Bhangale, Ashutosh Shewale, “Campus Navigation on Android Platform”, International Journal of Science Technology & Engineering, Issue - April 2016
[2] S.Neelakandan, Muthu Kumaran, Annamalai, “Implementing Indoor Location Tracking System ”,, Issue - 5 May
[3] Yang Dan, Liu Jiamin. Research on Augmented Reality Interactive Scene Based on ARToolKit[D]. Shenyang University of Technology, 2012.
[4] An event-driven university campus navigation system on android platform. Susovan Jana; Matangini Chattopadhyay. 2015 Applications and Innovations in Mobile Computing (AIMoC), IEEE 2015
[5] Bangare, P. etal.,. The Campus Navigator: An Android Mobile Application. International Journal of Advanced Research in
[6] Computer and Communication Engineering, 2014 Vishakha Shelke1, Janvi Shree Shrimal, Pragati Tiwari, Pallavi Pawar. Virtual Ally: Campus Navigation System using Tableau. International Journal of Computer Engineering in Research Trends, 2022
[7] Susovan Jana; Matangini Chattopadhyay. An event-driven university campus navigation system on android platform. 2015 Applications and Innovations in Mobile Computing (AIMoC), IEEE 2015
[8] Qin Yong-Xu, Liu Jia-Min, Qiu Hui, Yan Bo, Jin Chang-Xu. Campus Navigation System Based on Mobile Augmented Reality. 2013 6th International Conference on Intelligent Networks and Intelligent Systems (ICINIS), IEEE 2014
[9] Tadas, Srilakshmi R., and Bipin Krishna GA. "Campus Compass: A Flutter-based Interactive Map for Campus Navigation." Grenze International Journal of Engineering & Technology (GIJET) 10 (2024).
[10] Anpat, Vaibhav, Ashutosh Shewale, and Yogesh Bhangale. "Campus navigation on Android platform." Int. J. Sci. Technol. Eng 2, no. 10 (2016): 452-458.
[11] Arenghi, Alberto, Simone Belometti, Francesca Brignoli, Daniela Fogli, Fulvio Gentilin, and Nicola Plebani. "Unibs4all: A mobile application for accessible wayfinding and navigation in an urban university campus." In Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good, pp. 124-129. 2018.
[12] Valks, Bart, Monique H. Arkesteijn, Alexander Koutamanis, and Alexandra C. den Heijer. "Towards a smart campus: supporting campus decisions with Internet of Things applications." Building Research & Information 49, no. 1 (2021): 1-20.
[13] Cavus, Nadire, Seipati Elizabeth Mrwebi, Imran Ibrahim, Temiloluwa Modupeola, and Albert Y. Reeves. "Internet of Things and Its Applications to Smart Campus: A Systematic Literature Review." International Journal of Interactive Mobile Technologies 17, no. 23 (2022).
[14] Lu, Fangfang, Hao Zhou, Lingling Guo, Jingjing Chen, and Licheng Pei. "An AR Core-based augmented reality campus navigation system." Applied Sciences 11, no. 16 (2021): 7515.
[15] Romli, Rusnida, Amir Firdhaus Razali, Nur Hafizah Ghazali, Nik Adilah Hanin, and Siti Zuraidah Ibrahim. "Mobile augmented reality (AR) markerbased for indoor library navigation." In IOP Conference Series: Materials Science and Engineering, vol. 767, no. 1, p. 012062. IOP Publishing, 2020.

[16] Bagul, Harshali S., Kanchan S. Lachake, Ashwini G. Chaudhari, Jayshree J. Kolhe, and Umesh Pawar. "REVIEW ON-DESIGN AND IMPLEMENTATION OF OUTDOOR AND INDOOR CAMPUS NAVIGATION SYSTEM."
[17] Zhigang, Li, Qi Guanglei, Hu Wenkai, Ma Xiangyu, and Guo Qinsheng. "Application of Augmented Reality in Campus Navigation." In 2021 6th International Conference on Intelligent Computing and Signal Processing (ICSP), pp. 889-893. IEEE, 2021.
[18] Asmara, Rosa Andrie, Rizky Putra Pradhana Budiman, Mungki Astiningrum, Brian Sayudha, Anik Nur Handayani, and Cahya Rahmad. "QR Code Recognition on Flutter Framework Mobile Application Implemented on Entrance Security System." In 2022 Annual Technology, Applied Science and Engineering Conference (ATASEC 2022), pp. 113-124. Atlantis Press, 2022.
[19] Juliana, H. D. R., V. Naveen Kumar, G. Richard, and P. Shivadarshini. "Evecurate–A Smart Event Management App Using Flutter and Firebase." International Journal of Scientific Research & Engineering Trends 7, no. 4 (2021): 2519-2524.
[20] BILLINGHURST M, KATO H. Collaborative augmented reality Communications of the ACM, 2002, 45(7): 64-70.