Smart Campus Map

Sanjivani B. Adsul, Shreya J. Barsude, Shrey V. Barve, Rutika V. Bari, Keyur V. Barde, Owi S. Bartakke, Mansi S. Barse
Department of Engineering, Sciences and Humanities (DESH)
Vishwakarma Institute of Technology, Pune, 411037, Maharashtra, India

Abstract:- A web-based campus map is an innovative way to introduce newcomers and the general public. It gives a better idea of the overall campus. Such a map provides users with an intuitive approach to navigating the campus. We developed this map for students to explore the buildings, landmarks, campus facilities, and other campus-related information. A well-designed web-based campus map can enhance the overall user experience for the visitors, students, and staff and creates a user-friendly way to navigate the campus. A good atlas-based map helps the user to know their surroundings and the specifications of the landmark before actually going there.

Keywords:- Campus Map, Web-Based, User-Experience, Atlas-Based.

I. INTRODUCTION

In today's modern world, the accessibility of every piece of information online has become crucial. While traditional paper maps have been used for decades, web-based alternatives have become increasingly popular and taken over. Navigating a college or university campus can be a daunting task for new faculty, students, and visitors. Technological advancements have made it possible to simplify the navigation process by utilizing a campus map, which is a visual representation of a college or university, emphasizing the prominent buildings, floors, specific classrooms, canteens, and leisure areas around the campus. The online-based map is more convenient and accessible to the crowd. The map being an atlas-based model gives detailed information about every place you go on campus. It showcases all the main parts of the campus and highlights their information once clicked on the location. From self-experience, the realization of making a campus map arose when finding places on the campus and navigating through the campus classrooms became difficult. Due to the uneven layout of the buildings, finding classrooms for the first few times becomes challenging. Finding specific faculty members can also be a tedious task, as newcomers and visitors may not know the location of the staff rooms. To address this issue, classroom and floor layouts have been added to highlight places on each floor, such as the student section, specific teacher cabins, and even restrooms, which may be difficult to locate. This research paper will explore the benefits and limitations of a web-based campus map. It will examine various features and design considerations that make the map more implicit. By analyzing the results of the user studies and surveys, this paper aims to identify the key characteristics that improve the overall usability and effectiveness of campus maps, as well as the challenges that are faced by the map designers and developers. The cognizance gained from this research will be useful in creating a more user-friendly campus map.

Fig (1): Building 1 webpage

II. LITERATURE REVIEW

[1] Marylene S. Eder, Catherine Jean L. Nocete, Gemelyn L. Rances, Ethyl M. Tarrosa, Jenilyn N. Yanson (2015) Web Interactive Campus Map. International Journal of Scientific & Technology Research. The interactive web-based campus map is an application which utilizes the Google Maps. The dynamic features such as routing and overlays makes the map more interactive. Collection of building points were gathered for routing, and to create polygons which serves as representation of each building. The system created stores building, room, staff, event and campus guide data, making it a comprehensive Campus Information System. It is designed to be user-friendly, accommodating both trained and untrained users, and capable of fulfilling user needs.

[2] ROBERT E. ROTH , JAMON VAN DEN HOEK , ANDREW WOODRUFF, AARON ERKENSWICK, EVANGELINE McGLYNN5 and JOEL PRZYBYLOWSKI (2009) The 21st Century Campus Map: Mapping the University of Wisconsin-Madison. Journal of Maps an existing campus map website was the campus map website made on the Wisconsin Madison university. They published a research in January 2009 by Roth, R., Van Den Hoek, J. et al. in Journal of Maps. They had made 2 different types of maps. One was an atlas based model and the other was a way finding based model. The smart campus map will be based on the approach of an atlas based model.

The atlas based model they made on the Lakeshore Nature Preserve, their focus was upon providing information about each landmark and highlighting the particular place. Similar approach is used in the Smart Campus Map, where we highlight the different classroom and different locations and giving information about them.

[3] Mary odekule,odo kizito,isaiah sule, Andemola adenie (2019) Application of geographical information system in creating smart campus map. International conference of information and communication technology and its application. The usage of the digital maps driven by technological advancements has rendered obsolete. One of the main challenges encountered with paper maps is the difficulty in navigating effectively. To address this, the study employed ArcGIS as the digital mapping software for digitizing and simulating map features. The satellite image of the campus was obtained using Google Earth Pro 7.1. It was later geo-referenced for accuracy of the campus on the map. Their process involved digitization, attribute assignment, map creation, editing, and conversion to KML format, compatible with ArcGIS software. Android studio was utilized as an interactive software to enhance the functionality of the map. The resulting map was overlaid with Google API 21. The study focused on demonstrating the potential of GIS software and Android Studio.

[4] Chairil Andri, Mohammed Hazim Alkawaz, Amira Bibo Sallow (2018) Adoption of mobile augmented reality as a Campus Tour Application. International journal of engineering and technology. Augmented reality enables the superimposition of virtual objects or information onto the real-world environments. Many universities have embraced this technology by creating mobile campus touring applications that allow visitors to navigate through the campus using self-guided devices. Interactive features such as location search functionality, navigation assistance, 3D campus building visualisations, campus event updates, ecological environment exploration, virtual tours etc.

[5] San hlaing oo,si thu tun (2018) GIS application:Mapping and area analysis of MAEU Campus. International journal of current innovations in advanced research. The paper focuses on the implementation of GIS mapping and area analysis for the MAEU campus. The study employs various procedures including overlapping aerial photos, drawing shape files, creating a 3D model, and adding specific date and image classification. Tools such as Agisoft Photoscan, QGIS, and ArcGIS are utilized for these tasks.

[6] Gabriel L. Sataloff , Charles C. Kaufman & Norman S. Levine (2009) College of Charleston Campus Map. Journal of maps. The aim was enhancing the accuracy of the existing static map and creating an interactive online map of the campus. The researchers developed a GIS–based campus map that offers high accuracy. The developers gathered the spatial data from sources such as aerial orthophotos, County databases, and field surveys, which were then integrated into the campus map.

[7] Anna Liza A. Ramos, Kelly Leuther C. Matienzo, John Michael D. Casunuran, Carlo M. Nervida, Jose Mari S. Rosal and Angelique V. Bederico (2018) E-Vision: A Campus Locator Map Mobile Application using A* Algorithm. International Journal of Computer Science and Software Engineering. This study was focused on developing a locator map. Such maps are developed specifically for schools to guide students in locating specific places within the campus. These maps play a crucial role in increasing awareness, satisfaction, productivity, and accessibility. The study adopts Rapid Application Development model and utilizes ISO9126 to evaluate the application's functionality, reliability, usability, efficiency, maintainability, and portability. The evaluation yielded a score of 4.36 which is said to be "Excellent." By implementing the locator map, the school aims to enhances the overall experience for students by providing them with reliable and user-friendly tool to navigate the campus efficiently.

III. METHODOLOGY

The main target audience of The Smart Campus Map are new comers, students and faculty. This map will give them a brief view about their campus premise and make their college life easy with just a few clicks on their portable device. The prototype making of the website was done using a software tool, Figma. The prototype consisted of the following features, a search bar, click to view feature on map, highlighting particular location on clicking, and information being displayed of the particular area.

Fig (2): Prototyping using Figma

The map tracing was done from an existing map of the campus. The internal layout of the campus was done by floor surveying and hand designing the location of different classrooms and locations inside. The surveying was done in order to have more accurate location of each room. After the drawings were made of each floor, tracing of the classroom outlines was done using the Pen tool on Figma. The said traced floor is made into an SVG file. Taking pictures of each location mentioned and writing proper information about every landmark was also a crucial task in the making.

After the prototype was approved and finalized, the finished product was replicated using HTML, CSS and the basics of JavaScript. While trying to remake the prototype, certain challenges were faced, including, the touch to view feature was not enabling on the SVG of the Campus Map. This led to a few changes to the finalized design of the website.
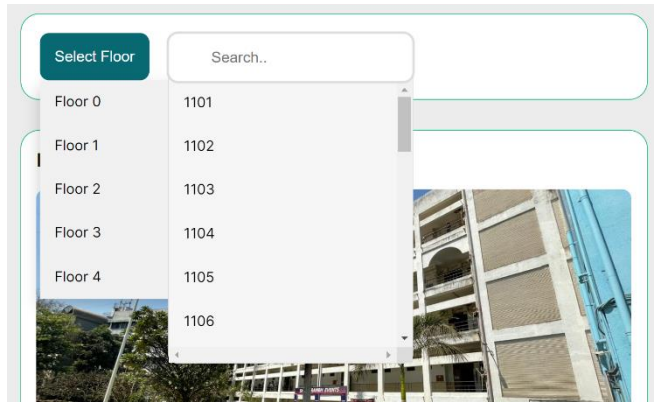

Fig (3): Current Interactivity of Map

IV. FUTURE SCOPE

This Campus Map being an atlas-based model, provides detailed and comprehensive information about the landmark, yet it is unable to provide exact routes for navigation. This feature will prove to be beneficial as our college is built on an uneven surface. Hence, adding this feature and making it a way-finding based model is an optimum choice.

Interactive features, such as the ability to select a particular landmark by directly clicking on its location on the map are unavailable. Hence, adding features like click-to-view would elevate the user experience.

The website can be integrated with other campus systems such as event calendars and course schedules to provide a more comprehensive view of the campus.

The map can be updated in real-time to reflect the changes made during the course of time such as building names, construction sites and parking lot availability.

Virtual tours with implementation of AR and 360-degree view will allow the prospective students and visitors to explore the campus in a more immersive way.

V. FLOWCHART
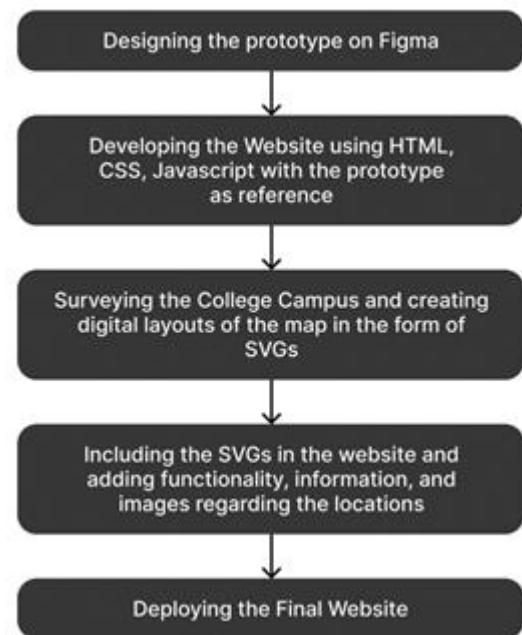
VI. CONCLUSION

In conclusion, the Smart Campus Map is a valuable tool for universities and colleges to provide an efficient way to navigate the campus an access important information. With the increasing availability of mobile devices and user-friendly technology, the use of a web-based map can help institutions provide more seamless and personalized experience to the community. Additionally, the potential future scopes such as integration with other campus systems, real-time updates, and interactive features can enhance the functionality of the map and provide an even more comprehensive and immersive experience for the users. A web-interactive campus map is a crucial tool for any modern educational institution.

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