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SMART COLLEGE VIEW USING AUGMENTED REALITY

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Abstract: This project explores the integration of Augmented Reality (AR) technology to create an innovative smart view of a college campus. Leveraging AR platforms such as ARKit or ARCore, and Unity Tool the application offers users an immersive experience by overlaying digital information onto the real-world environment. The feature of combining the real world with virtual objects enables Augmented Reality (AR) to provide a better display of information, resulting in its increasing popularity in a variety of industries. The key components include a digital campus map, markers triggering specific details and interactive elements. Creating 3D models of the campus that can be overlaid onto the real environment using AR, allowing users to explore a virtual representation of the campus. The goal is to enhance campus exploration, provide information, and foster engagement among students and visitors. Implementing QR codes at significant locations for campus views, providing users with an AR-guided experience that includes relevant information about each stop. Through careful development and user feedback, the project aims to deliver an accessible and user-friendly AR solution for an enriched college campus experience.

Keywords: Augmented reality, Campus tour, QR Code, Smart view.

I. INTRODUCTION

Augmented Reality (AR) technology has emerged as a transformative tool in this endeavor, offering a bridge between the physical and digital worlds. This project aims to leverage the capabilities of AR, alongside platforms such as ARKit or ARCore and Unity Tool, to create a cutting-edge Smart College View—a revolutionary approach to campus exploration. Augmented Reality, with its ability to overlay digital information onto the real-world environment, has garnered significant attention across various industries for its potential to deliver immersive and interactive experiences. In the context of higher education, the integration of AR presents a unique opportunity to redefine traditional campus tours and provide users with dynamic, informative, and engaging interactions. The core components of this project revolve around the development of a digital campus map, markers triggering specific details and interactive elements, and the creation of 3D models of campus buildings and landmarks. By leveraging AR technology, users can explore a virtual representation of the campus overlaid onto the real environment, offering a seamless blend of physical and digital worlds.

II. LITERATURE REVIEW

Mayank Patel, Monika Bhatt and N. S. Rathore "Promoting the Smart Tourism by Implementing Virtual Reality and Augmented Reality" AR generation can decorate the tourism enjoy by using offering immersive and interactive content material for travellers. AR can offer digital guides that offer audio or visible facts approximately historic sites, landmarks, or museums. Scanning monument and showing nearby places can be implemented using markerless AR technologies.The AR guide can spotlight essential functions, provide historic context, and provide travellers a deeper know-how of the region they may be travelling.

Chairil Andri, Mohammed Hazim Alkawaz, Amira Bibo Sallow "Adoption of Mobile Augmented Reality as a Campus Tour Application"AR for campus tour purposes leads to mobile application along with the increasingly sophisticated capabilities of mobile devices.The simplest way and most often used technique to achieve AR is marker-based tracking. Marker-based AR uses a camera and a visual marker to determine the center, orientation, and range of its spherical coordinate system.Mobile AR campus tour application is not intended to replace the traditional campus tour activities that are usually carried out by the campus parties It is expected to be a new media that helps these activities become more effective and memorable for the students and campus visitors.

T.-L. Chou and L.-J. ChanLin, "Augmented reality smartphone environment orientation application: A case study of the Fu-Jen University mobile campus touring system,"Users can simply point their smartphones to access real-time GPS-

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guided directions overlaid onto their physical surroundings, providing intuitive wayfinding through the university's sprawling campus. When starting the system, a user can set the search range between 0-5 meters, and select the types of buildings or places he or she wishes to visit, such as a certain library, a building, a restaurant, plays ground, or a dorm.Detailed information about campus landmarks, facilities, and historical points of interest is readily available, enhancing users' understanding and appreciation of their environment.

Jack C.P. Cheng., Keyu Chen., and Weiwei Chen. (2017). "Comparison of marker-based AR and markerless AR: A case study on indoor decoration system."Marker-based AR relies on predefined markers or patterns toanchor virtual content onto physical surfaces, offering precise alignment and stability but potentially limiting flexibility and scalability. Markerless AR tracks environmental features and surfaces without the need for markers, providing greater freedom of movement and context-awareness, albeit with potential challenges in accuracy and robustness. The accuracy of marker-based AR applications is relatively higher compared with markerless AR applications.

Ang Wei Liang, Noorhaniza Wahid a, Taufik Gusman "Virtual Campus Tour Application through Markerless Augmented Reality Approach"To enable the markerless AR function in the application, Wikitude Augmented Reality Software Development Kit (Wikitude AR SDK) was implemented into the application.With the aid of Wikitude AR SDK, the phone does not require very high specification and the support of the Google ARCore as well as the Google Play Services for AR.The Wikitude License Key can be requested from the Wikitude official website. Meanwhile, Android SDK, JDK, NDK, and Gradle must be downloaded and installed before building the project and publishing the application into Android Application Package (.apk) file.

III. PROPOSED METHODOLOGY

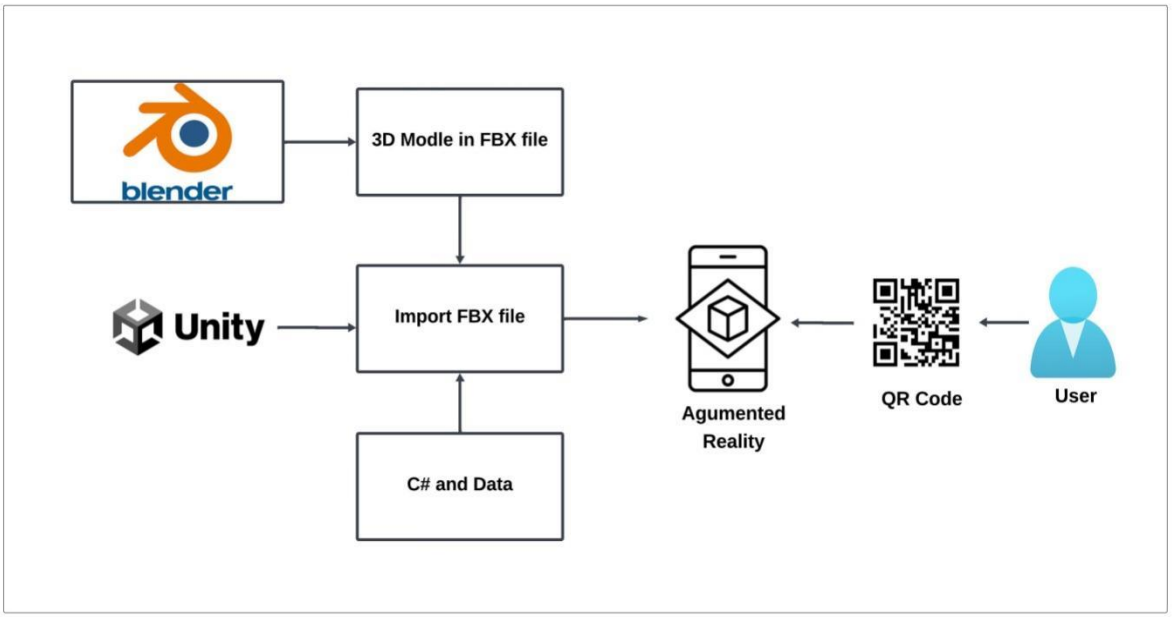

Fig 1: System Architecture

The system architecture for the Smart College View project revolves around leveraging Augmented Reality (AR) technology to create an immersive and informative experience for users exploring a college campus. The project built using Unity Tool and integrating with ARKit or ARCore, serves as the primary interface for users, overlaying digital information onto the real-world environment captured by their mobile devices' cameras. Key components include a digital campus map, markers triggering specific details and interactive elements, and 3D models of campus buildings and landmarks. These elements are seamlessly overlaid onto the real environment using AR technology, allowing users to explore a virtual representation of the campus in an engaging and interactive manner. QR codes placed at significant locations enable users to access AR-guided tours, providing relevant information and enhancing their understanding of each stop along the way. Integration with external services such as mapping services and multimedia content providers enriches the user experience further. Overall, the system architecture is designed to deliver an accessible and user-friendly AR solution that enhances campus exploration, provides dynamic information, and fosters engagement among students and visitors. Through iterative development and user feedback, the project aims to continually improve and refine the AR experience for an enriched college campus experience.

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IV. RESULT

Augmented reality (AR) technology into the college environment through QR code scanning offers a revolutionary "Smart College View" experience. With a simple scan, students can instantly access detailed information about campus buildings, academic departments, and upcoming events, enhancing their overall experience and facilitating seamless navigation. Despite these challenges, the Smart College View using augmented reality and QR code scanning holds immense potential to revolutionize the way students interact with their college campuses, promoting exploration, engagement, and connectivity.

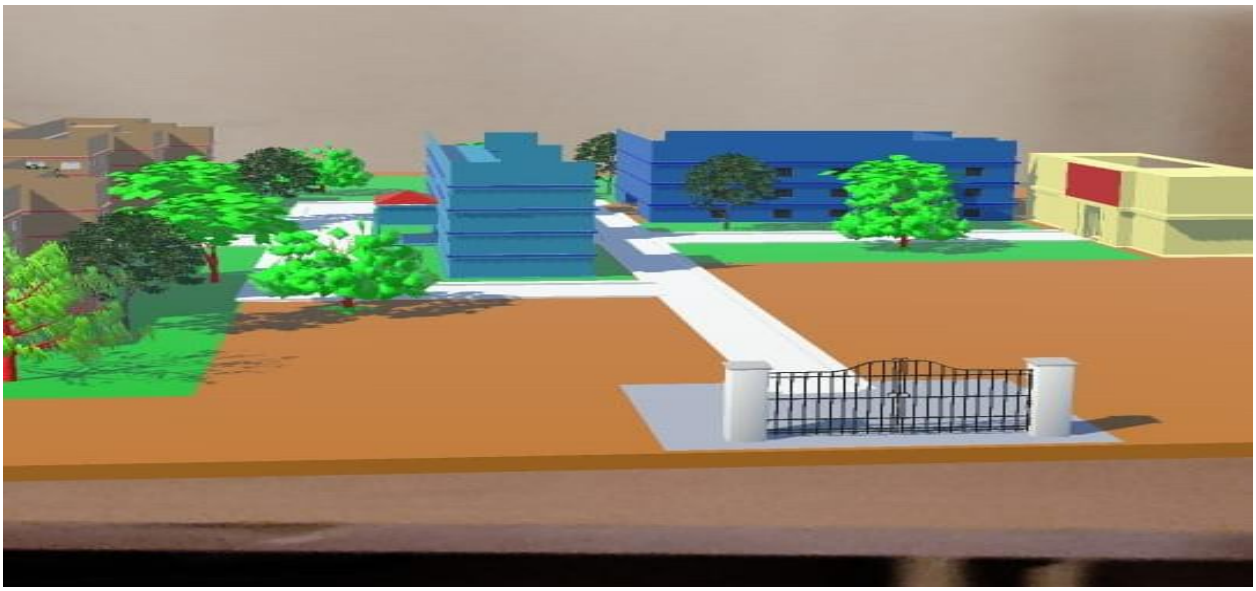

Fig 2: 3D Campus

Fig 3: CSE block

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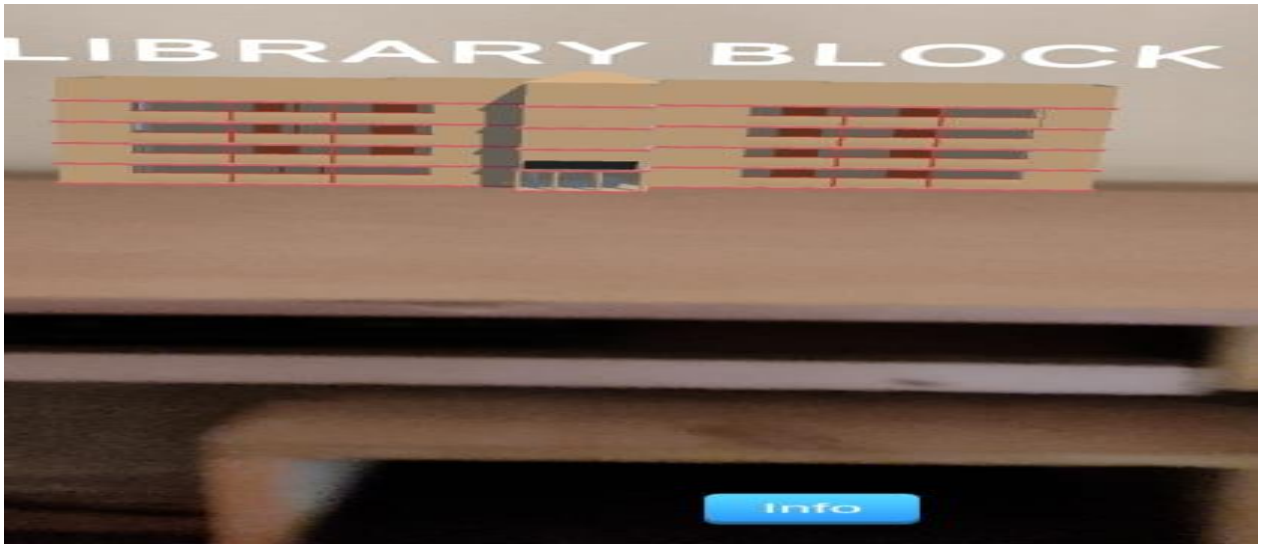

Fig 4: Library block

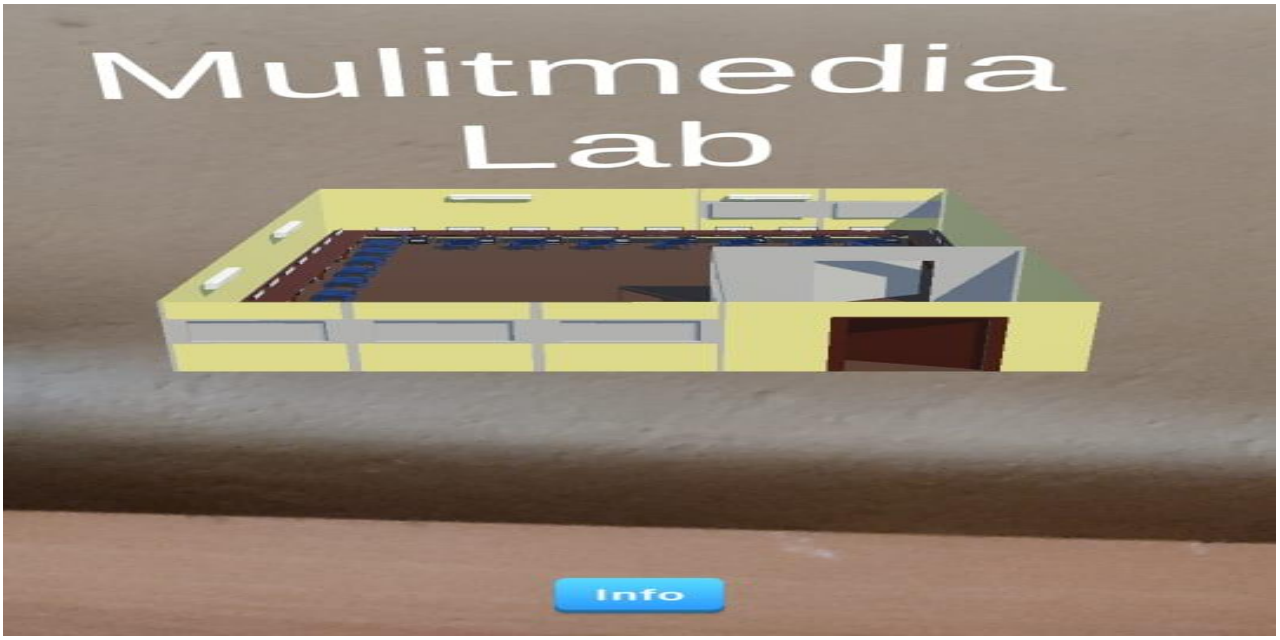

Fig 4: Laboratory

V. Conclusion And future enhancement

In conclusion, the implementation of Augmented Reality (AR) technology in the Smart College View project presents a groundbreaking solution to enhance the campus exploration experience. By leveraging AR platforms such as ARKit or ARCore, coupled with Unity Tool, users are offered an immersive and interactive means to engage with the college campus. The integration of a digital campus map, markers triggering specific details and interactive elements, and 3D models of the campus enables users to seamlessly navigate and explore a virtual representation of the campus overlaid onto the real-world environment. Moreover, the incorporation of QR codes at significant locations enhances the tour experience by providing users with AR-guided tours, complete with relevant information about each stop.

In envisioning future enhancements for the Smart College View using Augmented Reality (AR), several exciting avenues emerge to further enrich the user experience and expand the capabilities of the application. One key area for improvement

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lies in enhancing the interactivity of the AR environment. Future iterations could introduce more interactive elements, such as gamified challenges, quizzes, or collaborative activities, to engage users more deeply during campus exploration.

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