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AR Business Card

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Abstract: This project presents the development of an Augmented Reality (AR) Business Card using Unity and the Vuforia SDK, aiming to revolutionize traditional static business cards by integrating interactive multimedia elements. By scanning a printed card with a smartphone, users can access dynamic 3D content such as clickable icons for calling, emailing, viewing location, and connecting to social media platforms like Facebook, Instagram, YouTube, Flipkart, and Amazon. The system architecture comprises real-time marker recognition, 3D content rendering, interaction handling, and video playback, with Blender used for 3D modeling and Unity for scene behavior through C# scripting. Designed for professionals in visually intensive fields like architecture and interior design, this application enhances personal branding and portfolio presentation through an engaging and modern digital interface, underscoring AR's potential in transforming conventional professional networking tools.

Keywords: Augmented Reality, AR Business Card, Unity, Vuforia SDK, 3D Content, Image Tracking, Interactive Media, Professional Networking, Digital Portfolio, Multimedia Presentation, Marker Recognition, C# Scripting, Blender, UI/UX Design.

I. INTRODUCTION

In the era of digital transformation, Augmented Reality (AR) offers a compelling way to enhance professional networking by merging physical and digital experiences. Unlike Virtual Reality, which fully immerses users in a simulated environment, AR enriches the real world by overlaying interactive digital content such as 3D models, videos, and clickable links onto physical objects in real time. This project introduces an AR Business Card developed using Unity and Vuforia, designed to modernize traditional business cards by enabling smartphones to scan printed cards and display dynamic information like contact details, social media links, and promotional content. Tailored for visually driven professions such as architecture and interior design, the system demonstrates how AR can transform static cards into engaging, multimedia experiences, offering users a more interactive and informative way to present their identity and work.

II. LITERATURE SURVEY

[1] Professional Information Visualization Using Augmented Reality; AR Visiting Card by Mohammad Fahim Hossain, Niloy Biswas, Sudipta Barman, and A K M Bahalul Haque from the Department of Electrical and Computer Engineering, North South University, Dhaka, Bangladesh, was presented at the 2020 2nd International Conference on Sustainable Technologies for Industry 4.0 (STI), 19–20 December, Dhaka:

This study presents an innovative AR-based system that enhances traditional business cards by allowing users to view digital content—such as company information, contact details, social media links, and videos—through a smartphone scan. The system was developed using Unity and the Vuforia SDK, employing image tracking and virtual buttons to create an interactive user experience. The technical implementation includes 3D modeling, C# scripting, and animation. Despite the promising functionality, the authors identify limitations like background audio noise, detection challenges, and large app size, which they aim to improve through better UI design, button responsiveness, and Google Maps integration. The paper concludes that AR can significantly transform professional networking by making business cards more interactive and engaging.

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[2] Augmented Reality based 3D Business Card implementing Virtual buttons 2022 Second International Conference on Computer Science, Engineering and Applications (ICCSEA) | 978-1-6654-5834-4/22/$31.00 ©2022 IEEE | DOI: 10.11.09 /ICCSEA54677.2022.9936445 Posted by Meenu Gupta, Rakesh Kumar, Utkarsh Yadav, Devanshu Tuteja Department of Computer Science and Engineering Chandigarh University Mohali, India:

This work proposes an AR-enhanced business card system that replaces static information with dynamic digital content including 3D models, profile videos, resumes, and clickable virtual buttons linking to Gmail, LinkedIn, and GitHub. Developed using Unity 3D and the Vuforia SDK, the system uses image target recognition to trigger interactive overlays on scanned business cards. The methodology covers the entire development process—from Vuforia setup and target image uploads to scripting and animation in Unity. The paper also explores the relevance of AR in other industries, referencing IKEA and Lenskart for their innovative AR applications. The authors conclude that such AR business cards align with Industry 4.0 goals by offering a customizable, immersive, and efficient medium for professional branding and information sharing.

III. PROPOSED MODEL

Methodology:

The development of the AR Business Card application follows a systematic methodology divided into distinct phases to ensure effective integration of Augmented Reality features. The process begins with requirement analysis to define both functional and non-functional needs, such as real-time image detection, interactive 3D content overlay, and a smooth, user-friendly experience. Essential tools are then installed and configured, including Unity (the primary development platform), Unity Hub for project management, and Vuforia SDK for real-time AR tracking. Blender is used to design and export 3D models, while Visual Studio Code handles C# scripting for interactive behavior. Additional resources such as the Unity Asset Store, Blender Kit, and Ready Player Me provide pre-made assets and avatars to streamline development and enrich the user experience. This structured approach ensures that each component of the application contributes to a robust and engaging AR-based networking tool.

After setting up the necessary tools, the design phase involves creating the system architecture and defining how different components interact. The user interface is designed to be intuitive, enabling users to interact with the AR content through virtual buttons. The image targets—business card designs—are uploaded to the Vuforia Developer Portal for training and recognition. Once processed, the generated database is imported into Unity for scene development. The development phase includes importing 3D models created in Blender (such as icons for phone, location, and social media), scripting their behaviors in C#, and linking them to actions like opening web pages or switching scenes. Rigorous testing is conducted throughout to ensure accurate tracking, consistent performance across devices, and proper interaction response. Finally, the deployment phase involves building the application for Android devices, optimizing performance, and ensuring that the app runs smoothly in real-world environments. The methodology emphasizes modularity, scalability, and responsiveness to create a professional, high-quality AR business card experience.

Working Principle:

The working of the AR Business Card application is based on integrating Unity and Vuforia to create an interactive AR experience on Android devices. The process begins by downloading and installing Unity 3D and Unity Hub, followed by registering on the Vuforia Developer Portal. An image of the business card is uploaded to Vuforia, which is analyzed for feature points. If the image has sufficient feature points (greater than 3), a Vuforia license key is generated and integrated into Unity. The image is then used to create an AR Image Target, and a database file is downloaded for Unity integration.

Next, 3D virtual buttons are added to the image target within Unity. These buttons are then configured with specific functionalities using custom C# scripts, and animations are added to enhance visual interaction. The application is tested in Unity's play mode to verify functionality and interaction behavior.

Once the AR experience is validated, the application is built for the Android platform and the APK file is generated. This APK is then installed on an Android device. When the app is opened and the physical business card is placed in front of the device's camera, the AR content is triggered. The user can then interact with 3D virtual buttons, access links, and view media, making the business card dynamic and highly interactive.

This complete workflow ensures a seamless transition from a traditional paper-based card to an engaging, multimedia-rich digital experience using Augmented Reality.

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System Architecture:

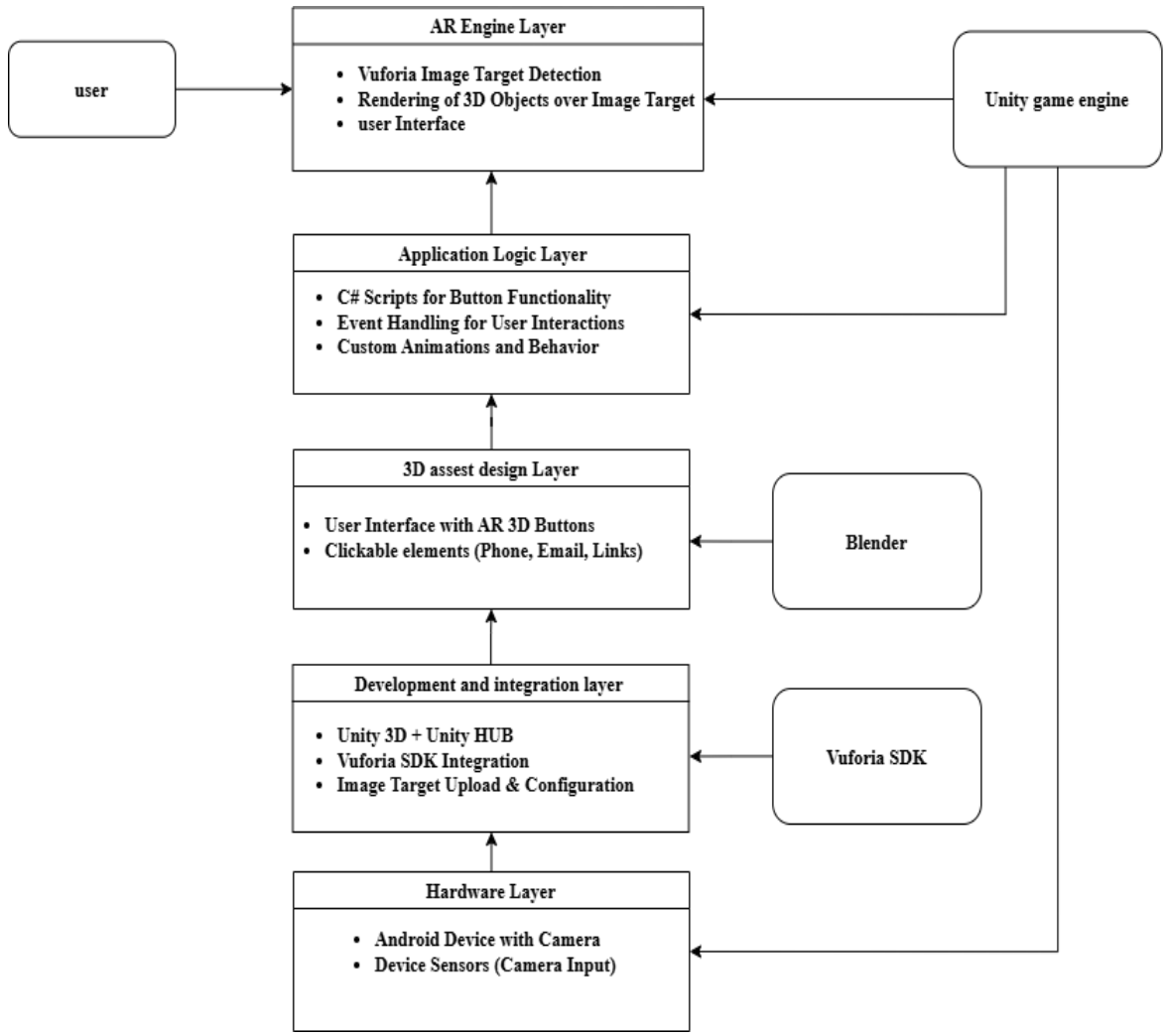

Fig. 1 AR Business Card Architecture

The system architecture of the AR Business Card application is structured in multiple layers to ensure modularity and clarity in functionality. At the core, the **Hardware Layer** includes the mobile device and camera which act as the input/output interface for the user. Above this, the **Development and Integration Layer** incorporates the **Vuforia SDK** for image recognition and Unity for application development. The **3D Asset Design Layer** involves the use of **Blender** for creating interactive 3D icons and elements that are integrated into the AR experience. The **Application Logic Layer** handles the control flow and interactions, such as button clicks and animations, using C# scripting within Unity. At the top, the **AR Engine Layer** ensures real-time detection and rendering of the image targets through the Vuforia engine. Supporting tools like Unity's game engine enable seamless execution of the app's visual and logical components. This layered architecture ensures a scalable, maintainable, and immersive AR solution for presenting business information in a modern, interactive format.

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System Workflow:

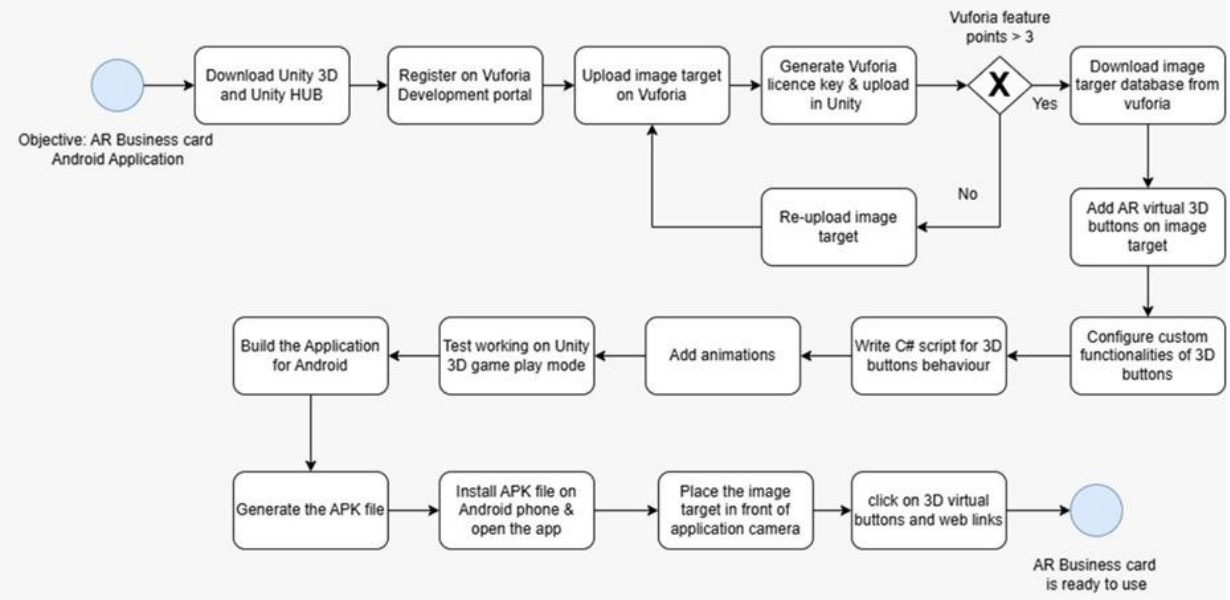

Fig. 2 AR Business Card Workflow

The working of the AR Business Card application is based on integrating Unity and Vuforia to create an interactive AR experience on Android devices. The process begins by downloading and installing Unity 3D and Unity Hub, followed by registering on the Vuforia Developer Portal. An image of the business card is uploaded to Vuforia, which is analyzed for feature points. If the image has sufficient feature points (greater than 3), a Vuforia license key is generated and integrated into Unity. The image is then used to create an AR Image Target, and a database file is downloaded for Unity integration.

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This complete workflow ensures a seamless transition from a traditional paper-based card to an engaging, multimedia-rich digital experience using Augmented Reality.

IV. RESULTS

The AR Business Card application was successfully developed and tested on Android devices using Unity and Vuforia. The system accurately detects the printed business card using Vuforia's image tracking and overlays interactive digital content, including 3D virtual buttons, contact details, social media links, and a video introduction. All functional requirements were met, including stable tracking, smooth video playback, responsive touch interactions, and seamless transitions between AR elements. The final APK was deployed on multiple Android devices, and the application performed reliably across different environments, lighting conditions, and hardware specifications. User testing confirmed that the interface is intuitive and the overall experience is engaging, demonstrating that the project objective—transforming traditional business cards into dynamic AR experiences—was effectively achieved.

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Fig. 3 Working Prototype of croma AR Business Card

Fig. 4 Redirection to PESCE website on clicking web icon

The above figures illustrates the working prototype of the Augmented Reality (AR) Business Card application. The system uses the Unity Game Engine in combination with the Vuforia Engine to detect and track the business card. When the business card is scanned using a mobile device or AR-enabled camera, the application recognizes the target image and overlays interactive 3D elements on the card in real-time. The prototype demonstrates the display of virtual content such as icons for call, email, location, and social media (YouTube, Instagram, etc.), as well as the business owner's details and company introduction. The smooth integration of physical and digital components reflects the system's ability to provide an engaging and informative experience for the user.

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TABLE I TEST REPORTS FOR PROPOSED SYSTEM

Test Case ID	Test Description	Expected Outcome	Result
TC_01	Verify AR target detection using VuforiaBehaviour under normal lighting	ImageTarget is recognized and activates its child AR content (VideoPlayer, 3D models)	Passed
TC_02	Test Vuforia tracking under low/high lighting conditions	TrackableBehaviour.Status remains TRACKED or EXTENDED_TRACKED; AR content stays stable	Passed
TC_03	Move image target while in view of ARCamera	Content bound to ImageTarget maintains correct world position and orientation	Passed
TC_04	Tap VideoPlayer GameObject using Physics.Raycast from touch input	VideoPlayer.Pause() is triggered, and playback is halted without resetting frame	Passed
TC_05	Tap paused video again	VideoPlayer.Play() resumes playback from last paused frame	Passed
TC_06	Tap on 3D virtual button GameObjects	OnClick event or custom C# method is triggered, and Application.OpenURL() executes correctly	Passed
TC_07	Trigger animation through user interaction	Animator component transitions state via triggers or booleans; animation plays as defined	Passed
TC_08	Deploy APK on a low-end Android device and run app	Unity runtime initializes correctly; Vuforia initializes; memory usage within limits	Passed
TC_09	Deploy on high-end Android phone and verify responsiveness	All components (ARCamera, rendering, UI, interaction) execute smoothly at expected framerate	Passed
TC_10	Test APK installation and app launch sequence	Unity splash screen appears; AR scene loads; ARCamera and tracking system start without errors	Passed
TC_11	Conduct user interaction test without guidance	Users are able to identify tappable AR elements; Unity UI and 3D design guide intuitive navigation	Passed
TC_12	View card from different angles and distances	Vuforia's TargetFinder and PoseEstimator maintain tracking; 3D content remains aligned	Passed

Fig. 5 Incremental Testing in unity

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V. CONCLUSION

The AR Business Card project successfully showcases how Augmented Reality can transform traditional business cards into immersive, interactive experiences. By integrating 3D elements such as social media icons, contact information, company branding, and promotional videos, this application enhances professional networking in a visually compelling and technologically advanced manner. The system, developed using Unity, Vuforia, and Blender, ensures accurate image tracking, smooth performance, and user-friendly interaction.

This project is particularly impactful for professionals in visual industries such as architecture and interior design, allowing them to present their portfolios and contact information in an innovative format. With its modular design and scalable architecture, the system is well-positioned for adaptation across various fields and user bases.

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We would like to express our special thanks to our faculty, **Bhavya D**, Assistant Professor, Department of Computer Science and Engineering, for her valuable guidance, consistent support, and motivation throughout our project.

REFERENCES

[1]. M. F. Hossain, N. Biswas, S. Barman, and A. K. M. B. Haque, "Professional Information Visualization Using Augmented Reality; AR Visiting Card," in Proc. 2nd Int. Conf. Sustainable Technologies for Industry 4.0 (STI), Dhaka, Bangladesh, Dec. 2020, pp. 1–6. doi: 10.1109/STI50764.2020.9350526.

[2]. M. Gupta, R. Kumar, U. Yadav, and D. Tuteja, "Augmented Reality based 3D Business Card implementing Virtual buttons," in Proc. 2nd Int. Conf. Computer Science, Engineering and Applications (ICCSEA), 2022, pp. 133–138. doi: 10.1109/ICCSEA54677.2022.9936445.

[3]. A. Jain and P. Agrawal, "Marker Based Augmented Reality Application Using Unity and Vuforia," in Proc. Int. Conf. Emerging Trends in Information Technology and Engineering (ic-ETITE), 2020, pp. 1–4. doi: 10.1109/ic-ETITE47903.2020.150.

[4]. M. Billinghurst, A. Clark, and G. Lee, "A Survey of Augmented Reality," Foundations and Trends® in Human–Computer Interaction, vol. 8, no. 2–3, pp. 73–272, 2015. doi: 10.1561/1100000049.

[5]. F. Zhou, H. B. L. Duh, and M. Billinghurst, "Trends in Augmented Reality Tracking, Interaction and Display: A Review of Ten Years of ISMAR," in Proc. 7th IEEE/ACM Int. Symp. Mixed and Augmented Reality (ISMAR), 2008, pp. 193–202. doi: 10.1109/ISMAR.2008.4637362.

[6]. C. Pereira and D. Dias, "Augmented Reality: A Systematic Review," in Proc. Int. Conf. Graphics and Interaction (ICGI), 2019, pp. 1–8. doi: 10.1109/ICGI47575.2019.8954612.

[7]. Unity Technologies, "Unity User Manual (2023 LTS)," [Online]. Available: https://docs.unity3d.com/Manual/index.html

[8]. PTC Inc., "Vuforia Engine Developer Portal," [Online]. Available: https://developer.vuforia.com