

Virtual Reality for Interior Design Presentation

BY

Aleena Varghese

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Dr. CHANDRA J



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Virtual Reality for Interior Design Presentation

Aleena Varghese

M.sc in AIML

Department of Computer Science

Christ University, Bangalore

Abstract--The place Interior designers can develop and share Virtual Reality presentations of their work on the platform is known as Interior Design Presentation in Virtual Reality. For interior designers and their clients, this platform offers a variety of advantages. It can save time and money by eliminating the need to build physical models of their designs. Even the feedback from clients early in the design process can be acquired, which can help to avoid costly changes later on. Clients can conceive know about how a design will appear in their own house or environment. Make educated selections regarding their design choices. Participate more actively in the design process.

Keywords: Virtual Reality (VR), Interior Designing, IRIS VR Prospect

I. INTRODUCTION

The modern method of working with a qualified interior designer is through virtual interior design. A potent technique that can be utilized to enhance the interior design process is virtual reality (VR). Compared to conventional 2D representations, virtual reality (VR) enables viewers to have a more realistic and engaging spatial experience. This might aid interior designers in better understanding the requirements and preferences of their clients. Prior to construction, VR can be used to find potential issues with a design. This may contribute to time and cost savings during the construction process. Although virtual reality (VR) is still a young technology, it is quickly gaining appeal in the interior design sector.

Users can interact with a virtual environment in real time via DRTV, a sort of virtual reality. Users are transported to a digital environment in virtual reality, which may be wholly fictional or based on actual places. They can use a variety of input devices, like as handheld controllers or motion tracking systems, to move around and engage in this virtual environment.

This enables users to explore a space and alter the design however they see fit. Increasing client and interior designer communication minimizes the number of design modifications required after construction up the interior design services' sales constructed. However, VR

offers a number of advantages, and in the future, it is likely to be a necessary tool for interior designers.

The art and science of upgrading interior spaces in buildings to provide a calming and useful environment is the subject of interior designing, a multidimensional field. To produce aesthetically beautiful and useful interiors, it comprises the creative use of texture, color, space, and light.

For environments to be transformed from ordinary to remarkable, interior designers are essential. They have a special combination of problem-solving abilities, technical expertise, and creativity to cater to the various needs and preferences of clients. Interior designers construct places that not only seem visually appealing but also fulfill their intended functions by giving careful consideration to elements like utility, ergonomics, sustainability, and safety.

II. LITERATURE REVIEW

Pavol Kaleja and Mária Kozlovská address Virtual reality (VR) technology is revolutionizing interior design by enhancing collaboration, reducing errors, and improving customer satisfaction. With VR, designers and clients can fully experience 3D interior settings, leading to better communication and understanding. It allows designers to identify

potential issues early on, saving time and money. VR also enables clients to visualize and confirm their desired space, resulting in higher satisfaction. Additionally, VR opens up new possibilities for creativity and innovation in design. Although challenges like cost and standardization exist, VR's increasing affordability and availability promise a significant impact on the future of interior design, transforming how spaces are created and experienced.

Norman Murray et al. writes Virtual reality (VR) technology is transforming interior design by creating lifelike virtual environments that clients can explore and experience. This enhances communication and ensures client satisfaction. VR allows clients to understand and visualize proposed designs before construction, preventing costly errors. It also speeds up the design process by enabling designers to experiment with different elements virtually. Real estate developers use VR to showcase properties, while interior designers gather client feedback through virtual representations. Furniture stores utilize VR to let customers try out furniture in their homes. Overall, VR improves productivity, efficiency, and customer experience in interior design.

Referring *Kai Cao and Lulu Li* Virtual reality (VR) technology is revolutionizing the representation of cities and buildings, offering a realistic and immersive experience. The authors propose a new VR tool for sketching building interiors and exteriors during the planning process. Their software provides interactions, realism, and resource efficiency. The VR application includes a 3D architectural model with adjustable lighting, allowing users to explore and visualize their future space. The program offers lifelike interactions such as altering interiors, opening doors, and changing lighting. It is user-friendly and combines teleportation with user movement to prevent motion sickness. While not as advanced as other specialized VR programs, it enables architectural visualization using cardboard-based VR.

Zhongcui Zhu and Yan Du Shanghai reviews Game engine technology, commonly used in computer game development, has found applications in the architecture and design industries. It enables the

creation of realistic interactive environments for interior design in virtual reality. The process involves modelling 3D objects and importing them into the game engine, where surface characteristics, lighting, and object interactions are defined. Scripting is used to add user interactions and behaviours. The final dynamic real-time visualization (DRTV) application can be experienced through devices like Oculus Rift or HTC Vive, allowing users to explore and interact with the virtual interior design.

Anett Rácz and Gergő Zilizi address Virtual environments (VEs) offer numerous benefits for the construction industry, including improved communication, reduced errors, increased productivity, and enhanced safety. However, challenges such as cost, complexity, data requirements, and integration with existing systems exist. Despite these challenges, VEs have the potential to revolutionize construction planning and scheduling, leading to more efficient and effective processes. As technology advances, VEs will become more affordable, user-friendly, and integrated with other construction systems. In the future, immersive VEs may allow users to experience the construction process firsthand, further enhancing their utility in the industry.

Faiq Amirul Ruslan et al. study aims to develop a VR-enabled approach for evaluating office layout designs and compare it to traditional rendering-based methods. The objectives include developing the VR approach, analysing differences in human perceptions and satisfaction between the two approaches, and verifying the effectiveness of the VR approach through subjective and objective measurements. The significance lies in contributing to knowledge by investigating the influence of VR on human perceptions and design features in office layout selection. The expected outcomes include the VR-enabled evaluation approach, statistical analysis of differences, and an assessment of consistency with design principles.

Tolga Kılıç1 & Damla Altuncu2 used the Sense of Presence (SOP) test to measure how realistic the students found the CSV application. The test consists of seven items that rate the individual's experience of

the virtual environment on a scale of 1 to 7. The researchers found that the students had a high sense of presence in the virtual environment, as indicated by the high scores they obtained on the sub-factors of the SOP test. This suggests that the CSVr application could be a valuable tool for teaching interior architecture.

Shuang Wu and Sangyun Han describes VR and AI to have the potential to revolutionize the interior design industry. VR enables users to experience virtual spaces and identify design issues before construction. AI automates tasks and provides personalized design recommendations. Cost and lack of standardized workflows are challenges, but decreasing costs and wider adoption will address these issues. VR improves communication and collaboration between designers and clients, while AI streamlines processes and enhances personalization. Together, VR and AI offer opportunities to enhance the efficiency and creativity of interior design, providing immersive experiences and tailored solutions for clients.

Andhika Pramalystianto1 et al. reviews VR technology to offer realistic simulations of wood joints and furniture, benefiting training, design, and marketing. It enables training for carpenters and designers, allowing them to learn and experiment with different wood joints and furniture designs. VR also facilitates the creation of virtual prototypes for design evaluation and client feedback. In marketing, VR can be used to showcase furniture in virtual showrooms, providing customers with an immersive and interactive experience. This allows customers to browse, purchase, and visualize furniture in their own homes, enhancing convenience and engagement.

Mun On Wong et al. describes use of virtual reality (VR) technology is transforming the interior design sector by fostering better teamwork, cutting down on mistakes, and raising client happiness. Through the use of VR, clients and designers may become fully immersed in 3D interior environments, improving communication and comprehension. Early problem detection helps designers avoid costly and time-consuming construction mistakes. Client satisfaction with the final design is higher as a result of VR's ability to let clients imagine and validate their ideal setting.

Virtual reality also provides fresh opportunities for design innovation and creativity. VR is used by real estate developers to exhibit their houses, and by interior designers to get useful client input. Customers may browse and interact with furniture in a realistic fashion before making a purchase decision by using VR to create virtual showrooms for furniture companies.

The rising accessibility and affordability of VR technology, despite issues like cost and standardization, promise a substantial impact on the future of interior design. With its immersive experiences and customized solutions, virtual reality is revolutionizing how spaces are designed, used, and promoted.

III. METHODOLOGY

IRIS VR Prospect

Virtual reality (VR) solutions for the architectural, engineering, and construction (AEC) sector are the focus of the software company Iris VR. They have created the "Prospect" platform, which enables users to turn their 3D models into lifelike VR experiences. Prospect allows architects, designers, and other professionals to explore and interact 1:1 with their creations, giving users a more accurate and engaging understanding of the place. The platform offers features like annotations, measurements, and collaboration tools and supports a variety of VR headsets, including the Oculus Rift and HTC Vive. Prospect from Iris VR is a potent tool for design visualization, communication, and decision-making that has been rapidly embraced by the AEC sector.

Iris VR Prospect provides improved design visualization, enhanced collaboration, efficient design review, client engagement, time and cost savings, and integration with existing workflows. It empowers users to make informed decisions and create successful projects in the AEC industry.

The architecture, engineering, and construction (AEC) business can use Iris VR Prospect, a virtual reality (VR) software platform, to turn their 3D models into lifelike VR experiences. This is how it goes:

1. Importing 3D Models: Users can upload their 3D models onto the Prospect platform from

well-known design programs like Autodesk Revit, SketchUp, Rhino, and more.

2. **VR Experience Creation:** After the 3D models are imported, users can design the scene, add materials, change the lighting, and add interactive features to create virtual reality experiences.
3. **Immersive Exploration:** Users of the VR headset can explore the virtual environment while immersed in their designs at 1:1 size. They are able to move about, engage with objects, and have a real-world sense of the surroundings.
4. **Collaboration and Communication:** Prospect makes it possible for numerous people to join the same VR session at once, fostering collaboration and communication. As a result, stakeholders, clients, and team members can digitally collaborate, communicate, and make design decisions in real time.
5. **Measurements and Annotations:** By allowing users to contribute measurements, markups, and annotations right within the VR environment, users may more easily express design modifications and offer feedback.
6. **Workflow and Integration:** Prospect enables a fluid workflow between 3D modelling tools and the VR platform by integrating with widely used design software. This makes it possible to synchronize and update designs in an effective manner.

Iris VR Prospect offers a potent tool for decision-making, communication, and design visualization in the AEC sector, improving comprehension and cooperation among project stakeholders.

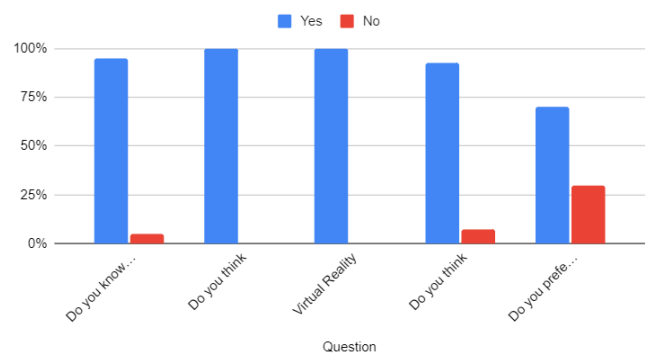
IV. RESULTS AND ANALYSIS

Analysis phase is to find problem with the current situation, brainstormed ideas, and gather feedback on the ideation through survey. Survey was conducted from June to July 2022. Total of 137 respondents with the minimum gap between male and female, which is

57% and 43%. The highest age group of the respondent is between 17 to 25 years old. Thus, the survey reached the ideal age group as the target audience is young people. In addition, this age group adaptable with technology and has minimal issue in operating any gadget or techno device. The purpose of this survey analysis as pre-test data and to provide initial insight Virtual Reality (VR) in interior architecture education.

Question	Yes	No
Do you know the existence of Virtual Reality (VR) application?	95%	5%
Do you think Virtual Reality (VR) education application will change the way of learning in technical drafting and visualization in interior architecture education?	100%	0%
Virtual Reality (VR) application is related to education. Do you agree?	100%	0%
Do you think that Virtual Reality (VR) will become one of the sources to gain knowledge about technical drafting?	93%	8%
Do you prefer to learn technical drafting and visualization	70%	30%

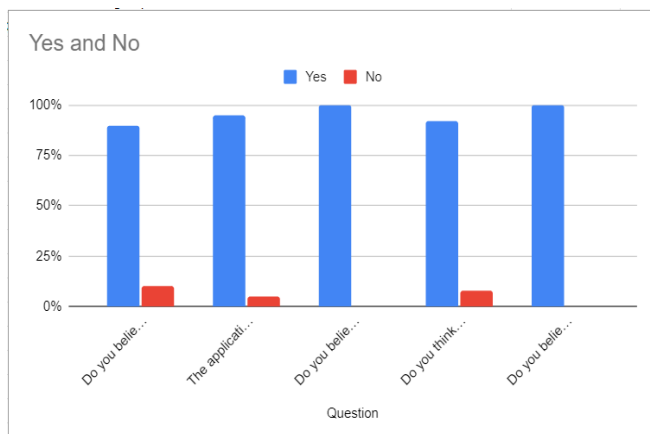
Yes and No



Questionnaires have been conducted with students from the Diploma Interior Design program. The purpose of the questionnaire is to gain feedback on the usage of virtual reality in enhancing the skill of technical drafting. The duration of testing the VR application was timed, and the results show that the average time spent using the application was 10 minutes, and the findings indicate that this time was an average of 10 minutes. This implies that the programme is easier to use for users who are accustomed to virtual reality technology, regardless of their level of experience. The main findings are presented in the following table.

Findings from respondent

Question	Yes	No
Do you believe that VR applications will aid you in viewing 2D technical drawing in 3D view?	90%	10%
The application developed for this project made the VR tools easy to use?	95%	5%
Do you believe the project contains information in technical drafting for interior architecture students?	100%	0%
Do you think using VR, students will explore immersive and fun learning experiences?	92%	8%
Do you believe that VR content for this project will help students to understand technical drawing in interior design lessons better?	100%	0%



Based on the analysis of the survey, the VR application received positive feedback from the respondents. Users required no assistance in operating the VR application. Also, the result demonstrated that users can easily use the VR application and understand the interaction well. The information gathered in the VR application is useful and enhances their knowledge in technical drafting. All respondents agreed that they are satisfied with the application even if it is a first experience with the application. Moreover, they gave positive feedback on the application usability. Therefore, this project delivered the educational content of the interior well to the targeted student.

Additionally, using VR technologies in architecture design instruction is deemed to be appealing, interesting, and creative.

V. CONCLUSION

Virtual reality (VR) is transforming the interior design sector by fostering cooperation, minimizing mistakes, increasing client happiness, and creating new opportunities for creativity and innovation.

Designers and clients may completely experience 3D interior settings through VR, improving communication and comprehension. Early problem detection helps designers avoid spending time and money later. Customers are more satisfied because VR also makes it possible for them to check and envision the area they want. Virtual reality also provides fresh opportunities for design innovation and creativity.

Although there remain obstacles like cost and uniformity, VR's growing accessibility and affordability promise to have a huge impact on the future of interior design, revolutionizing the way rooms are imagined and used.

AEC professionals can use the VR software platform Iris VR Prospect to transform their 3D models into realistic VR experiences. It includes tools for collaboration, measurements, comments, and compatibility for various VR headsets.

Prospect offers greater collaboration, effective design review, client engagement, time and cost savings, and interaction with existing workflows in addition to improved design visualization. It enables users to produce successful projects in the AEC sector by enabling them to make informed decisions.

In summary, Iris VR Prospect is an effective tool that AEC professionals may use to enhance their design process and produce better results for their clients.

Due to the significant advantages, it provides over conventional design techniques, virtual reality (VR) is set to become a crucial tool for interior designers in the future. Through the use of immersive virtual showrooms, customers can experience furniture and design options in the comfort of their own homes, for instance.

Additionally, designers can be trained in new methods and materials via virtual reality.

The interior design industry could undergo a transformation thanks to VR, which is an effective tool.

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