*International Conference on "The impact of emerging technologies on global societies: Environment, Ethics, Innovation and sustainability (IETGS 2025)" organized by Government Polytechnic College, Dewas, Madhya Pradesh on 27 Feb 2025.*

# The Combination of Design and Emerging Technology Prepares for a Better Future

Sucheta Nigam
Associate Professor
Sanjeev Agrawal Global Educational University
Bhopal, India

*Abstract*: **In an era characterized by rapid technological advancement, the intersection of design and emerging technologies presents significant opportunities for innovation and improvement across various fields. Both humans and technology are improving over time. To create or provide a quicker and better result, they gradually immerse themselves in these new technologies. The challenge for Interior Designers is to meet the needs of these changing generations by presenting their expectations and desires for design. Everyone wants to achieve something amazing in a shorter amount of time. This paper explores the synergies between design and technology, emphasizing how their combination can address contemporary challenges such as environmental sustainability, social equity, and enhanced user experiences. Therefore, the purpose of this paper is to shed light on the ways that the fusion of Design and Emerging technology has improved design and construction methods. The goal is to use technology to increase the accuracy and durability of materials. The study's findings will assist Interior in developing their design tools with the aid of technology, which can significantly reduce costs and save time. The findings suggest that to prepare for a better future, stakeholders must embrace a holistic approach that values the interplay of aesthetic appeal with technological functionality, ultimately leading to transformative solutions that resonate with users' needs and aspirations. This paper concludes by advocating for a proactive stance among designers and technologists to continuously evolve their practices, ensuring that the combination of design and emerging technology not only enhances productivity but also contributes to a more equitable and sustainable world**

*Keywords***:** Design; Emerging Technology; Designing techniques

## 1. INTRODUCTION

As Bob Dylan stated lyrically, The Times They Are a-Changin'. Change is the reality of life. There is a constant need to change as generations are changing. Consequently, Technology has categorised and transformed the Worldwide Village. Barely 20 years back, a search for information through the internet was not in existence, likewise social networks on phones. Nowadays there have been expansions in technology not restricted to science, commerce, healthcare, entertainment, defence, and education. Like that in architecture, there has been solid evidence to allude that the technological revolution in the field is frequently accelerating. The continuous innovation in technology and swiftly changing tools are motivating the fabrication of a fundamentally novel architecture for the Twenty-first century.

Technology has accelerated the production of novel kinds of creations that have not been created before. Therefore, it could be articulated that it has facilitated creativity. Design and technology have always been intertwined, but the speed at which new technologies are developing today—like blockchain, machine learning, and augmented reality—has fundamentally altered the field. This essay makes the case that tackling today's issues, improving user experiences, and advancing sustainability all depend on a comprehensive approach to design that considers cutting-edge technologies. In this context, design is defined as a problem-solving approach based on human-centered considerations, rather than just aesthetics.

Technology also bestows multimedia and virtual reality. This can offer new dimensions to artworks. Design and Art have a long past of employing a variety of devices and materials to create an artistic work, artefact, or to accomplish a particular design goal. Thus, technology and association have all the time been embedded in the art to

some degree.

The challenges that influence architecture as an upshot of the continual progression of technology have forced it to expedient to swap traditional design systems with new ones that associate with the trendiness of the present world. New technology empowers Architecture to cater for and support the growing demand for products and services through enhanced capacity.

Technology has changed the world in merely a few periods. For Interior designers, builders and architects, technology has grabbed a front place in the experience of building a structure and designing. From beginning to end, technology shapes the approach in which the architect designs buildings and the way clients perceive the process of design. Technology can enhance building proficiency and durability and making it effortless for Architects and Designers to Conceptualize and visualize design of building more accurately and smartly. The level of new technology is growing exponentially.

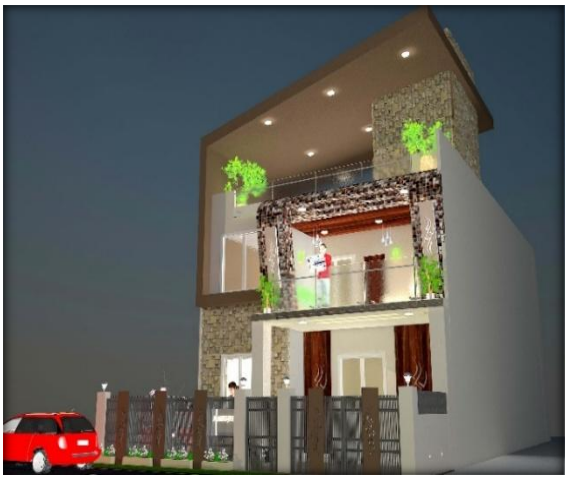
Technology and Future eternally go hand in hand and bestow ever shining outcomes. The futuristic trends in technology and the desire to acquire the best facilities and techno-equipped environments, architects are following same trends. There are many new technologies that is making the architects job easier and at the same time challenging. In architecture, an architect concentrates on the conceptual phase. In this phase, the architect explores and generates new ideas established on evaluating the problem [1]. Now a days attempts were made to integrate new digital tools in the early stage of design.

In this paper researcher will review various futuristic technology in architecture and how the Combination of Art and Technology Prepares for a Better Future

## 2. REALISTIC 3D RENDERINGS

Nowadays, 2D presentations do not satisfy clients anymore, beyond this they need visualization [10]. There are many Clients having dilemma in imaging 3D space, and as an architect it is mandatory to visualize the 3D space to them. If clients will not be able to visualize the space, they can't take the decision and it will inversely effect on the work and the time of the Architect [2].

As affirmed by Gao Zhimin & Huang Jiaxi [3] development of 3D rendering in the architecture field generates interactivity, fascination and provides Realistic Renderings. 3D rendering is 3-Dimensional picture having components of Architecture and illustration to create realistic views of how final project will appear as shown in the figure1. 3D rendering is so realistic, serve as extremely versatile and lucrative planning and marketing tool for architects and designers.



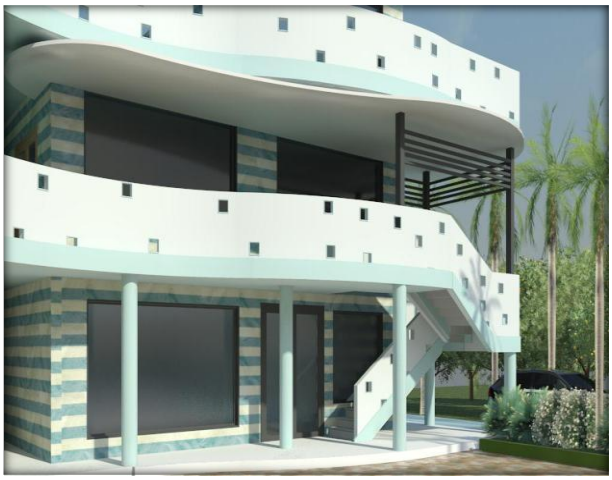



Figure 1: 3D Renderings

3D photorealistic rendering generates compelling imaginations through the utilization of specific software. It eases to visualize the creative design and accomplish desired modifications before the structure begins. 3D photorealistic renderings can be done with help of various software like:

- Revit
- 3D MAX
- Auto CAD
- SketchUp
- Maya
- Lumion
- Unity
- Unreal
- Cinema 4D

***3D PRINTER***

In the 1980s 3D printers were invented initially it was known as 'rapid prototyping.' It permitted businesses to design prototypes very accurately and swiftly than any other procedures. In the future of industrial production, 3D printer is a promising instrument because of its accuracy, flexibility, and speed. Therefore, it plays a significant role in nearly all the industry like art, medicine, design and. architecture, Applications of 3D printers are far more diverse today. In the perspective of Architecture, yet it is in its infancy nevertheless it's exposing as vital tool and real promise in the field of architecture.

3D Printing is an advanced technology in manufacturing 3D models through 3D printers by layering sequential layers of specific material as shown in figure 2. The 3D Printers collect commands from CAD software to generate models or 3D scanners help them to replicate it.

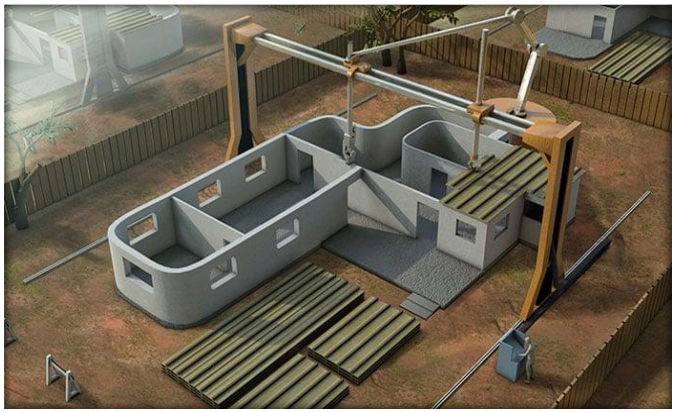



Figure 2: 3D Printing

The process of 3D printing, which was founded by Dr Behrokh Khoshnevis, also termed Contour Crafting, requires appreciably less labour compared to traditional methods of building. By using 3d printing or Contour Crafting, safety of the labour is increased as well as reducing the labor cost as stated by Mathur R. [4]. This 3D printing technology empowered architects to design scale models speedily and economically, in every phase of the Architectural design. 3D printers offer enhanced visualization, stability, wind, & sound etc. and optimization tests [5].

### *DIGITAL SKETCH BOOK*

The great tool in architecture is Sketchbooks as it makes an architect's for apprehending loose ideas & help to remember it. These sketchbooks were graphite-covered and clunky, and it takes large amounts of area on shelves. In the present scenario traditional way of sketching using paper and pencil is an indispensable mode for architects. Nowadays sketchbooks are digital as shown in the figure 3. Along with drawings can be saved easily, recalled and displayed deprived of a smudge of graphite. Digital sketchbook both extends and imitates the potential of the sketch into a new-fangled form [6].

There are various benefits of using a sketchbook, such as its proficiency to share, store & post digital sketches. It can incorporate images and export to other devices and formats, and undo is like a blessing [7].

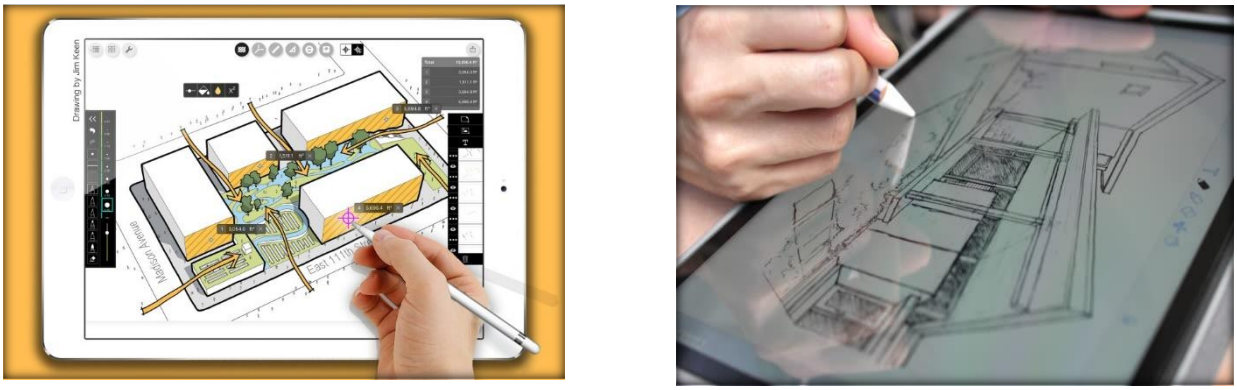


Figure 3: Digital Sketch Book

### *VIRTUAL REALITY*

In the past, architect dependents on 2D renderings and 3D models to visualize the product to client before it was built. These help to get the job done, but there are various limitations. 2D drawings and 3D models could not satiate the clients as it leaves them wondering what their finished space or product will look like. The clients cannot sense the depth with the help of 2D & 3D. Now a days clients want to interact and explore the design proposed by the architect freely [8]. Virtual reality as it has the capability to resolve the problems in architecture of low productivity.

Figure 4: Virtual Reality

Virtual reality is a relatively latest technology that has been utilized in various fields, like education, gaming, and design. Modern Virtual reality having head mounted display (HMD) as shown in the figure 4 which have stereoscopic tracking devices that simulate perception of depth and offers the presence feeling. As the client feels like getting inside door, explores the way to entry, opens closets, walks down to hallways, experiences looking out of the windows and feels like moving around in space.

Clients can take a virtual tour of area without going and seeing it in person. Moreover, it helps clients in understanding the design concept and decision-making as confirmed by Agrahari & Sridhar [9].

In future it looks like inevitable that Virtual reality will replace the 2D renderings and 3D models and become vital in the construction process.

## 3. CONCLUSION

The architecture world is always growing, and advancements are made with time. The new technology in architecture has made various things possible which was unheard previously. That made modern design buildings more practical, and flexible. It also allowed for trying different ideas.

This novel technology is continuously improving the life of architects. Technology is making architects work faster by saving time and money. Making it easy for visualization and communication.

The technology in Architecture, like technology in another field, is always developing. Many of new trends are just arriving at play, and the Combination of Art and Technology Prepares for a Better Future and it will improve in the forthcoming years. It is a high time to get used to the forthcoming technologies and the perfect way to flourish in a future

## REFERENCES

[1]. Heidari, Parvin & Polatoğl, Çiğdem (2019) Pen-and-paper versus digital sketching in architectural design education. International Journal of Architectural Computing. 17(3), 284–302 https://doi.org/10.1177/1478077119834694

[2]. Zhang Yu, Huang Geng (2019) Study on Virtual Reality Technologies in the Teaching of Residential Interior Design, Atlantis Press. doi 10.2991/iccesd-19.2019.10

[3]. Gao Zhimin, Huang Jiaxi (2018). Design and Application of Virtual Reality Technology In 3d Interior Design and Simulation System

[4]. Mathur, Rajshree (2016) 3D Printing in Architecture International Journal of Innovative Science, Engineering & Technology, 3 (7), 583-591

[5]. Beyhan, Figen & Selçuk, S. Arslan(2018) 3D Printing in Architecture: One Step Closer to a Sustainable Built Environment Proceedings of 3rd International Sustainable Buildings Symposium (ISBS 2017), https://doi.org/10.1007/978-3-319-63709-9_20

[6]. Dzurilla, Dalibor, & Achten, Henri (2021) What is Architectural Digital Sketch? A systematic inventory. https://papers.cumincad.org/data/works/att/ecaade2021_288.pdf

[7]. Şener, Bahar (2014) Investigating The Feasibility Of Digitally Created Industrial Design Sketchbooks METU Journal of the Faculty of Architecture 31(1) DOI:10.4305/METU.JFA.2014.1.7

[8]. Falahi, Al, Ahmad (2022) Virtual Reality in Architecture. https://www.researchgate.net/publication/360189252

[9]. Agrahari,Vartika, & Chimalakonda, Sridhar (2021) What's Inside Unreal Engine? - A Curious Gaze! https://doi.org/10.1145/3452383.3452404

[10]. Kubanova, Alisa (2016) The process of creating a 3D model of hotel interior. Bachelor's Thesis Information Technology, MAMK University of Applied Science. theseus.fi/bitstream/handle/10024/112866/AlisaKubanovaThesis.pdf