Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 7 (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

The AI Design Revolution's Impact: Transforming Consumers To Creators

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Cite this paper as: Rechab Londhe, Dr. Gunja Soni, Dr. Imran Mirza, (2025) The AI Design Revolution's Impact: Transforming Consumers To Creators. *Journal of Neonatal Surgery*, 14 (7), 1330-1339.

ABSTRACT

The revolutionary impact of artificial intelligence (AI) on the design field is examined in this study, with a particular emphasis on how AI helps turn customers into active designers. Trends analysis is a method frequently used in design to analyse current and possible future trends. [7] With the development of AI technology, customers are no longer only beneficiaries of things that are made for them; rather, they are now actively involved in the design process. The development of AI paved the path for intelligent interior design solutions and, in the end, began to pose a challenge to interior designers by enabling customers to use new materials with ease when applied correctly. The aforementioned advancements in technology, such as augmented reality and artificial intelligence, social media, user-friendly design software, interior planning apps, and online material information, are increasing the potential of the final product and streamlining the process from point Business (B) to Consumers (C). Thus, in this day and age where technology manages and gives direct accessibility to the user, the idea of Do It Yourself (DIY) emerges. In other words, by creating items for their homes on their own, buyers avoid hiring interior designers for interior design work. This research seeks to shed light on how the AI design revolution is changing the dynamic between creators and customers in the modern world by examining the potential, problems, and ethical issues surrounding this phenomenon.

Keywords: *Artificial Intelligence, Interior Design, DIYers, Consumers Awareness*

1. INTRODUCTION

With the development of science and technology and the improvement of people's health and environmental protection concepts, more and more researches on environmental monitoring systems have emerged, and some environmental monitoring products and equipment have emerged. [9] It is a new technical science that extending human intelligence which can studies theories, methods, technologies and application systems for simulating. [11] With one of the greatest forces changing the market in recent years being Artificial Intelligence (AI), we found AI is fundamentally changing consumers into design creators by giving them the tools and capabilities once unavailable or requiring specific knowledge. AI Regards design as favours design-related knowledge transfer and incorporates, principles and best practices into the tools. This enables users to learn and use design principles without requiring years of formal education in design. Interior design tools like AI streamline the process to make it more efficient and cost-effective. Customers can quickly develop multiple design concepts, which eliminates the time typically spent practicing trial-and-error and avoids extra expensive professional advice. The table below defines the differences for the traditional design methods vs AI Based Design Methods:

Table 1: Traditional Design Methods and AI Based Design Methods

Sr. No.	Description	Traditional Design Method	AI Design Method
01.	Visualization	Hand-drawn sketches and physical mood boards	Realistic 3D renderings, VR walkthroughs, and AR overlays
02.	Personalization	Based on designer's interpretation of client's preferences	AI analyses client data to provide highly personalized recommendations
03.	Time Efficiency	Longer process due to manual work and iterations	Faster iterations and design generation through AI algorithms

04.	Cost Efficiency	Higher costs due to time-intensive manual work	Cost-effective with optimized budgeting and alternative suggestions
05.	Space Optimization	Relies on designer's experience and intuition	AI optimizes space utilization based on room dimensions and functions
06.	Material & Colour Selection	Based on designer's knowledge and sample testing	AI provides data-driven recommendations for materials and colours
07.	Trend Awareness	Depends on designer's knowledge and research	AI analyses vast data to identify and predict trends
08.	Sustainability	Depends on designer's expertise in sustainable practices	AI recommends eco-friendly materials and energy-efficient designs
09.	Convenience	Multiple meetings and physical visits required	Remote collaboration through AI tools, seamless process
10.	Decision-Making	Client relies heavily on designer's guidance	Informed decisions with AI comparisons and insights
11.	Stress and Uncertainty	Higher stress due to limited previews and uncertainty	Reduced stress with realistic previews and data-driven choices
12.	Project Management	Manual tracking of budgets and timelines	AI assists with budget optimization and timeline management
13.	Furniture and Decor Matching	Based on designer's experience and availability	AI provides personalized and cohesive furniture/decor suggestions
14.	Error Reduction	Potential for manual errors	Reduced errors with automated processes and validations
15.	Client Engagement	Limited to design meetings and physical presentations	Interactive and engaging through virtual and augmented reality tools

The historical development of the prefabricated interior has been critical in the development of modern prefabrication techniques and in the assemblage of interior three-dimensional space. [2] Therefore, based on above aspects, our study tries to dig deeper into the transformation element that helps the consumers to transform into creators and to find the same, we could bifurcate the elements which equips the arsenal of the consumers through following factors:

2. EMERGENCE OF AI BASED TECHNOLOGIES IN THE FIELD OF INTERIOR DESIGN

Advances in machine learning, data analytics, and computational design have fuelled a surge of AI-based technologies in interior design over the last decade. An application is to make in which a client can get all the services which is needed to renovate your interior design of your accommodation. [4] These tools look at loads and loads of design data using AI and show us lots of design patterns What can we infer from it tips and patterns that help designers choose better decisions. That includes knowing the types of colour schemes, furniture styles, and spatial arrangements that tend to attract different demographics. AI fuels interior design with respect to factors such as space, light, sound and sustainability. The application of advanced technologies, based on smart materials, has the capacity to significantly improve the sustainability of buildings. [1] This leads to environmentally-greener and energy-efficient designs. So let us go through some of the popular AI apps and websites in the field of interior design developed in recent years:

I. **Planner 5D:** An AI-powered app that allows users to create detailed floor plans and 3D models of interior spaces with a user-friendly interface.

Figure 1: https://images.app.goo.gl/RybJUbKdwypGvT4t7.

II. **Houzz:** Integrates AI to provide personalized home design ideas, product recommendations, and visualization tools, helping users see how different items would look in their spaces.

Figure 2: https://images.app.goo.gl/oq36Rg3fgesgqxEf7.

III. **Modsy:** Uses AI to create 3D renderings of rooms and provides design recommendations based on user preferences, including furniture and decor options.

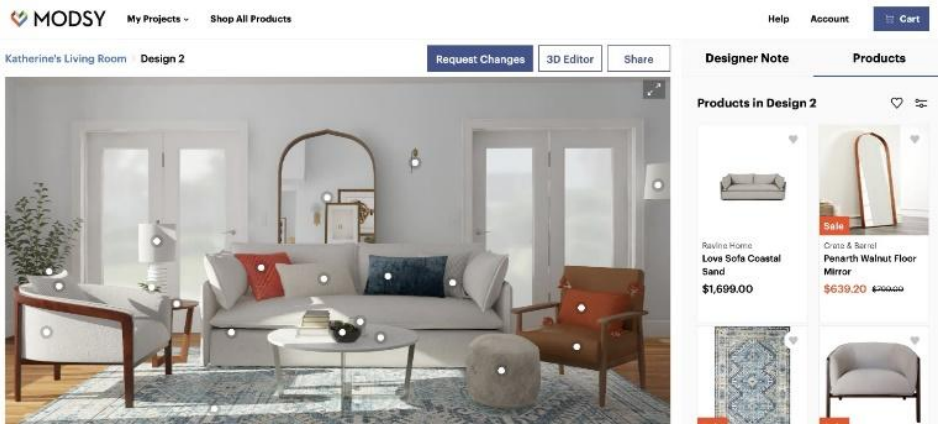


Figure 3: https://images.app.goo.gl/KWdDBd1rKRLLDe479.

IV. **Havenly:** An online interior design service that leverages AI to match users with professional designers and generate design concepts based on style quizzes and user input.

Figure 4: https://images.app.goo.gl/JWSRhKvbrXPLqwzQ8.

V. **Roomstyler 3D Home Planner:** Offers AI-enhanced tools for creating 3D home designs, allowing users to experiment with different layouts, furniture, and decor.

Figure 5: https://images.app.goo.gl/vZ1Lxm1THvY6cJNH8.

VI. **DecorMatters:** An app that uses augmented reality (AR) and AI to help users visualize and design their spaces, offering a wide range of design ideas and furniture options.

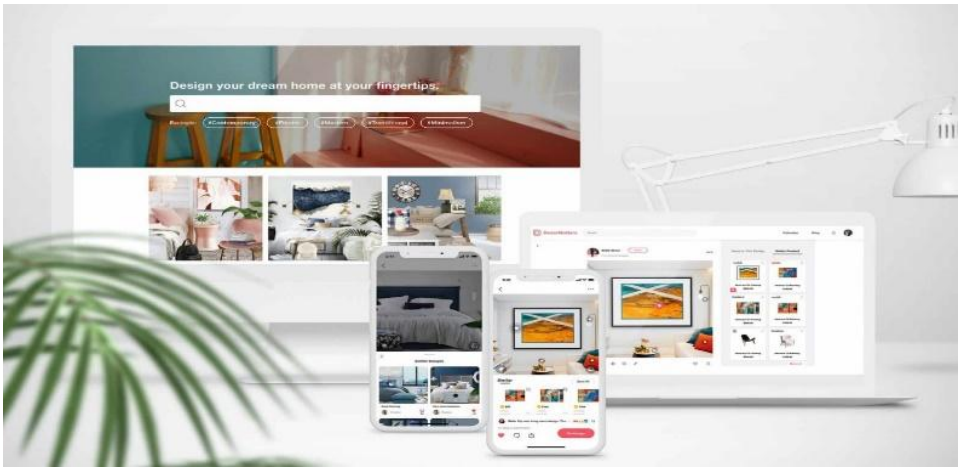


Figure 6: https://images.app.goo.gl/e3RbPH2w7gkBe9Zx9.

VII. **Homestyler:** An AI-driven interior design app that allows users to create floor plans, furnish rooms, and visualize their designs in 3D.

Figure 7: https://images.app.goo.gl/SnxFKKi9DxMCrXWt6.

VIII. **Morpholio Board:** Combines AI with AR to help interior designers and homeowners create mood boards, plan spaces, and visualize products in their homes.

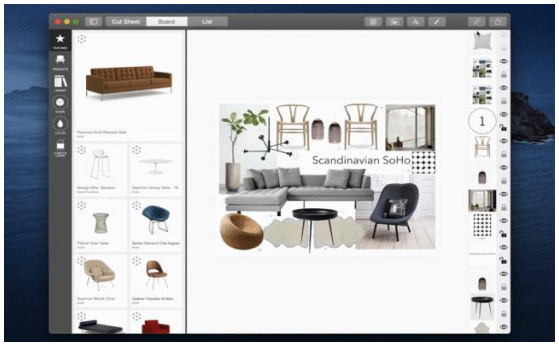


Figure 8: https://images.app.goo.gl/bf7VmhNkCUoj4Tr26.

IX. **Live Home 3D:** A home design software that uses AI to assist in creating detailed 2D and 3D floor plans and interior designs.

Figure 9: https://images.app.goo.gl/U57x1jdAkpfekgZ39.

X. **IKEA Place:** An AR app powered by AI that allows users to place true-to-scale 3D models of IKEA furniture in their homes to see how they would fit and look.

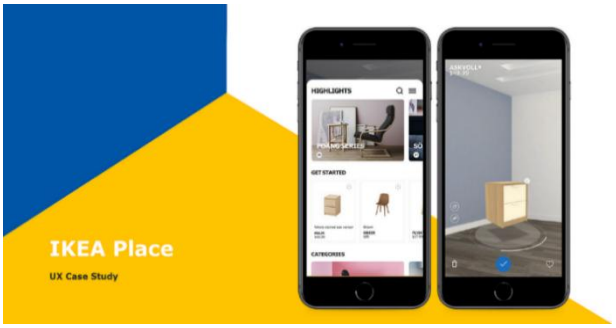


Figure 10: https://images.app.goo.gl/rDBWQYz8634tEK3aA.

These platforms leverage AI to enhance various aspects of interior design, from visualization and personalization to product recommendation and space optimization. Such technological manifestations paved the way for smart interior design solutions, and stimulated the environment for designers studying the effect of integrating smart solutions into aspects of sustainable interior design as well. [6]

3. CONSUMER AWARENESS ABOUT DESIGN TECHNICALITIES, ESTIMATION DETAILS

The technology is an ever-developing entity, and alongside affecting our lives, it is critically integrated with the spaces we live and incline to organize. [10] Consumers in the modern era are not only more conscious when it comes to design but how they spend their hard-earned money as well. They take their research and planning more seriously, frequently obtaining multiple quotes and using online calculators to get a feel for how much they should expect to spend. The contemporary consumer knowledge around design technicalities and costing minutia in relation to interior design is mediated by improved

access to information, the proliferation of design related media, and the ease of user-friendly design tools. Even, Interior designers use instruments and support to help create a space that appears the way it is intended to be seen. [3] Web sites and blogs offer a detailed breakdown of costs to assist you understand the concepts of interior design in the eyes of pros. Similarly, platforms such as Amazon, Wayfair and IKEA have thousands of products that you can search for based on your needs and also receive cost estimates and compare. It allows consumers to know if the purchase decisions they are making are within their total design budget. Design apps like this include budgeting tools so users can see how their changes impact the overall cost to build. This involves pricing for material, labour and furniture.

4. RISE OF DIYERS

There is almost an infinite number of how-to tutorials in the Internet, about everything and everything that will teach you step by step how to do a DIY project. YouTube, Pinterest, DIY Blogs and the entire medium, offers unlimited possibilities. Doing it yourself cuts down on the high cost of employing professional designers and contractors. Design tools enabled with AI and augmented reality help people to conceptualise their needs, and arrive at informed decisions, eliminating the gap between amateurs and experts. Given that, amidst various materials, tools and decor items available, e-commerce platforms have made it convenient for you to make purchases and get them delivered, the DIY projects are also on the rise! Most home improvement stores have prefab materials and kits for those that want to do the installation themselves. The use of sustainable practices in home decoration is becoming increasingly common, and the DIY approach often includes some element of recycling, upcycling, and reusing, helping to eliminate waste and climax... Last, but not least, a DIY project allows you to experience the satisfaction and pride in a job well-done. So, in summation, the more freely accessible information, expansive design field and transparent professional work practice are reining the era of modern consumer where one will get better aware of the customization otherwise technical approach, financial and being on self-dependent, and many factors of interior designing. Although DIY is currently different from interior designer, in the future,

DIY possess an opportunity to get into the field of interior design deeper along with the technology advancement. [14]

Methodology

After getting into the details about the “Transformational Factors,” there is still a lot to study about the available AI tools in order to increase the level of literacy amongst the consumers or the end users. The internet now has resulted in a new mode of exchange between buyer and sellers and has created an alternative for the traditional marketplace. [12] In order to study the same in details, we should focus on the aspects like:

5. SEGREGATED ELEMENTS VS. ORGANIZED APPROACH

Above we understood that the AI Tools are a lot in numbers but nothing of each provides as such an overall output that could satisfy the user needs. If you have observed most of the AI tools only gives you design outputs where some gives you both design and estimation and not all having VR technology. So, lets study this through below table:

Table 2: Segregated Elements Vs. Organized Approach

Sr. No.	Description	Segregated Elements in AI Design	Organized AI Design Approach
01.	Definition	Focuses on individual design elements separately	Integrates all design elements into a cohesive, holistic plan
02.	Design Process	Analyses and optimizes each design element independently	Considers the interrelationship between all design elements
03.	Visualization	May offer separate visualizations for different design aspects	Provides a unified visualization of the complete design
04.	Customization	Allows for detailed customization of individual elements	Customizes the overall design based on comprehensive analysis
05.	Efficiency	Can be efficient for making isolated design decisions	Enhances overall efficiency by optimizing the entire design process
06.	User Experience	Users may need to piece together various design elements	Provides a seamless and integrated design experience
07.	Flexibility	High flexibility in tweaking specific elements	Balances flexibility with the need for a cohesive design
08.	AI Tools	Tools that focus on specific tasks, like	Comprehensive design tools that

	Examples	furniture placement or colour selection (e.g., IKEA Place, ColorSnap)	cover all aspects of interior design (e.g., J'nesisIDT)
09.	Learning Curve	May require users to understand how to integrate separate elements	Simplifies the learning process by providing an all-in-one solution
10.	Outcome Consistency	Outcomes may vary as users combine different elements	More consistent outcomes due to integrated approach
11.	Adaptability	Easily adaptable to changes in specific elements	Adaptable but changes are considered in the context of the whole design
12.	Application	Suitable for projects focusing on specific areas (e.g., just furniture or lighting)	Ideal for comprehensive interior design projects covering all aspects
13.	Examples in Practice	Using multiple apps for different tasks: one for floor planning, one for decor	Using a single platform that provides a complete design solution from start to finish

Based on the above table, we could understand the necessity of Organized AI element which could act as an effective tool for transforming Consumers into Creators and there is only one tool as such, which covers all aspects of Interior Design and that is "J'nesisIDT," whose official website has been launched in India (www.jnesisidt.com).

6. ABOUT J'NESISIDT

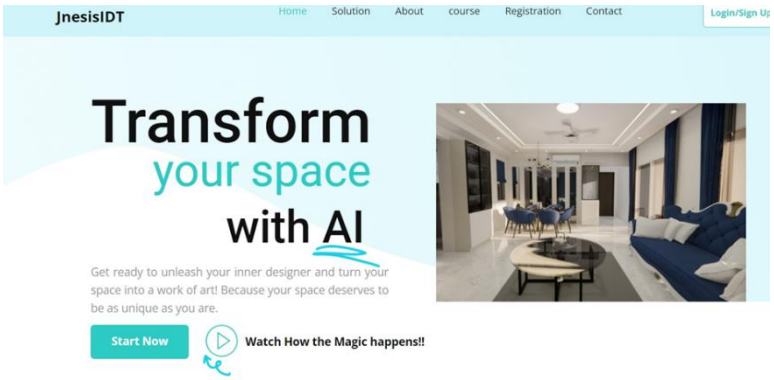


Figure 11: www.jnesisidt.com.

The newly launched J'nesisIDT interior design web application is a cutting-edge tool aimed at revolutionizing the way interior design projects are conceived and executed. This platform integrates advanced AI technology to offer a suite of features that streamline and enhance the end-to-end design and execution process which includes Planning, Designing, Estimation, Scheduling and connected with the Manufacturers/Retailers/Service Providers in nearby periphery. Here are some key aspects of J'nesisIDT:

I. **AI-Powered Design Generation:** The application uses AI to generate design ideas based on user preferences and space dimensions. This allows for rapid prototyping and experimentation with different styles and layouts.

II. **Planning & Designing (2D and 3D Visualization):** Users can create and view their designs in both 2D and 3D, providing a comprehensive perspective of the space. This feature helps in better understanding spatial arrangements and aesthetics from multiple angles.

III. **Furniture and Decor Library:** J'nesisIDT includes an extensive library of furniture and decor items from various brands, enabling users to furnish their spaces with real products. This makes the design process more realistic and practical.

IV. **AR and VR Technology (Virtual Staging and Remodelling):** The platform supports virtual staging and remodelling, allowing users to visualize changes in real-time. This includes altering wall colours, flooring, and

furniture placement without any physical changes.

V. **Collaborative Features:** The application facilitates collaboration, allowing users to share their designs with others, gather feedback, and make collective decisions. This is particularly useful for professional designers working with clients.

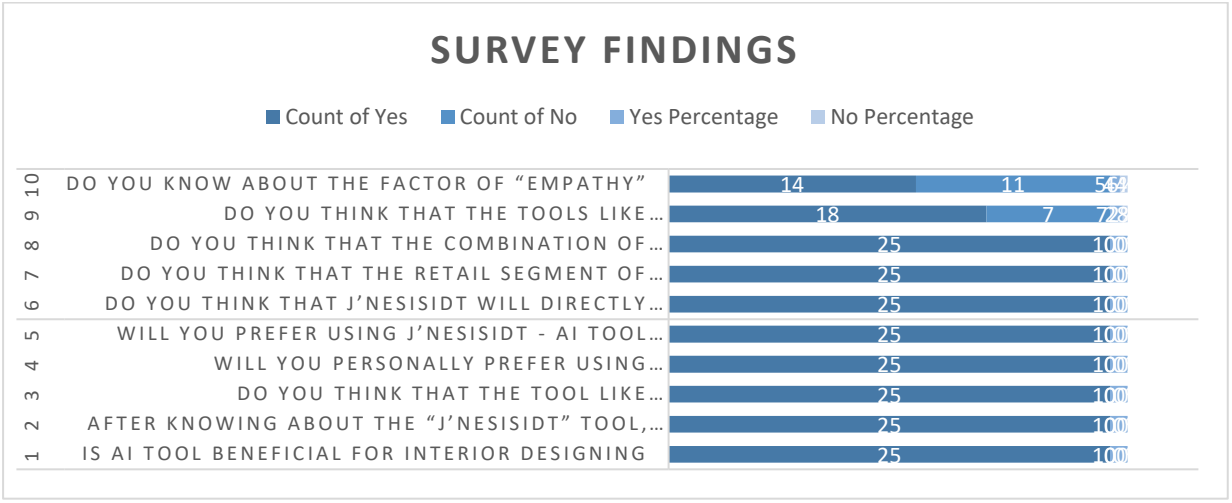
VI. **User-Friendly Interface:** Designed to cater to both professionals and amateurs, J'nesisIDT offers an intuitive interface that simplifies the design process, making it accessible to users with varying levels of expertise.

Thus, J'nesisIDT aims to make interior design more accessible, efficient, and enjoyable by leveraging the power of AI and advanced visualization tools. It stands out as a versatile solution for consumers, professionals, students, and manufacturers in design projects. By 2030, artificial intelligence and automation could take away 38 percent of total jobs in the United States. And from the remaining 62 percent of jobs, 85 percent have not been invented yet. [15] Therefore, new inventions like J'nesisIDT becomes the dynamic AI tools which could prove to be the core transformational element for the consumers in coming future.

7. RESULT

Human computer interaction is highly important in the day-to-day tasks performed by interior designers. [5] Therefore, based on the current consumers, DIYers trends and their brainstormed ideas, our study tried to analyse and gather feedback on the ideation through survey. At this level, emotion and pleasure engineering plays important role in product design. [8] Therefore, in this survey we took the reference of J'nesisIDT web application and explained the outputs to the consumers or the end users that this AI tool provide. Survey was conducted in May, 2024. Total of 25 respondents. This survey was to determine whether the AI tool like J'nesisIDT could really help the consumers, end users or the DIYers to transform into creators? To identify the same, the close-ended questionnaire was framed and conducted with consumers from various occupational background. The purpose of the questionnaire was to gain feedback on the efficient, economical, time saving and detailed output about the planning, designing, estimation and scheduling data from AI based J'nesisIDT tool. The main findings are presented in the following table.

Chart 1: Findings From the Respondents



Therefore, based on the above stats we could formulate the following hypothesis:

1. Null Hypothesis (H0): The proportion of participants who find the AI tool beneficial is equal to a specified value (e.g., 50%).
2. Alternative Hypothesis (H1): The proportion of participants who find the AI tool beneficial is not equal to the specified value.

To determine the relevant data for the question, "Is AI tool beneficial for Interior Designing?" has been done on the count of "Yes" and "No" responses. Based on same, we can use a one-sample proportion test, like Fisher's exact test which works for small sample sizes. But here we have proceeded with the "Proportion Test". The null hypothesis assumes that the proportion of "Yes" responses is 0.5 (50%).

The Interpreted Results, if p-value < 0.05: Reject the null hypothesis, suggesting a significant difference from the hypothesized proportion. If p-value ≥ 0.05: Fail to reject the null hypothesis, suggesting no significant difference from the

hypothesized proportion.

Results of the One-Sample Proportion Test:

- Count of "Yes" Responses: 25
- Total Responses: 25
- Proportion of "Yes" Responses: 1.0 (100%)
- Test Statistic (z): ∞ (indicating an extreme deviation from the hypothesized proportion)
- p-value: 0.0

Therefore, the Null Hypothesis (H0): The proportion of participants who find the AI tool beneficial is 50% and Alternative Hypothesis (H1): The proportion of participants who find the AI tool beneficial is not 50%. Whereas, p-value < 0.05: The p-value is 0.0, which is significantly less than 0.05. This means we reject the null hypothesis.

The statistical test provides strong evidence to reject the null hypothesis. Thus, we conclude that the proportion of participants who find the AI tool beneficial is significantly different from 50%. In this case, all 25 participants (100%) responded "Yes," indicating a unanimous perception of the AI tool being beneficial.

Based on the analysis of the survey, the provided information about the J'nesisIDT web application received positive feedback from the respondents. Users believes that no assistance will be requires in operating the J'nesisIDT web application. Also, the result demonstrated that user can easily use the J'nesisIDT web application. The explained outputs in the J'nesisIDT web application about the planning, designing, estimation, scheduling and furthermore connection with the retailers, manufacturers and service providers are like one stop solution to the end users or the consumers and it is believed to enhanced their knowledge about Interior Design. All respondents agreed that the AI tool like J'nesisIDT web application will provide the must required transparency about the execution process, through estimation and scheduling details, which will encourage the consumers to dare for executing their own concepts and ideas. Additionally, using AI technologies like J'nesisIDT in Interior Design is deemed to be appealing, interesting, and creative.

8. DISCUSSION AND CONCLUSION

We are in the era where the factors like comfort, luxury and presentable lifestyle is in demand. Since the products are quite similar and there are no significant differences in quality or price, the choices are based on more than traditional variables. [13] Therefore, the people or the DIYers community tries and dares to achieve the same in the available and achievable budget. DIY does not make designers losing them job. Instead, it encourages creativity. [14] The AI based tools like J'nesisIDT, fulfils the basic requirements of the end user by giving them a clear picture about the Interior Design and Execution details and it even takes them further by providing the confidence and independence to execute the designs as per their wish and will. Though the AI tools like J'nesisIDT seems impractical for few industry experts, but AI will surely challenge the capabilities of the professionals in coming future. The 'tough of war' about proving the best between the Human being Vs. Robotics will always lean towards the humans, as the factor of senses, empathy, feeling is retained by the humans. But everyone should not forget the capabilities of Bots which is based on data storage. Therefore, larger the data, more précised will be the outcomes from the Bots which could be challenging or equivalent to human based outcomes which are based on the factor of senses, empathy and feelings.

Abbreviations

AI – Artificial Intelligence

VR – Virtual Reality

DIY – Do it yourself

J'nesisIDT – J'nesis (Genesis) Interior Design Technology

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