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ARTIFICIAL INTELLIGENCE (AI): PRACTICES AND PROBLEMS EXPERIENCED BY INTERIOR DESIGNERS

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ABSTRACT

The development of artificial intelligence (AI) has swept the globe. Tools of artificial intelligence are now readily available to everyone due to the advancement of new and more refined AI every day, and they carry the potential to fundamentally alter the way one lives, works, and interacts with their surroundings. The interior design strategy based on artificial intelligence technology is being used to optimize the entire interior design work to increase technological innovation in space. Designers can input their preferences and design ideas into artificial intelligence systems for interior design and receive suggestions for furniture, colour palettes, and other design elements. These AI applications are helpful to optimize the work management of an interior designer as well as appease the clients. The main aim of the research study is to find out the practices and problems experienced by Interior designers regarding the applications of artificial intelligence in professionally managing and completing interior design projects. Data was collected from 80 respondents using a questionnaire through the purposive sampling method. The results of this investigation were valuable for Interior Design professionals, to get refined knowledge about the development of Artificial Intelligence tools used in professional management of Interior Design. Through this study various informative programmes can be conducted about the latest trends in Artificial Intelligence technology, its use and applicability.

Keywords: Artificial Intelligence, Interior Design, Tools, Practices and Problems

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1. INTRODUCTION

The world has seen a surge in the development of artificial intelligence (AI). The widespread availability of artificial intelligence tools has the potential to drastically change the way individuals live, work, and interact with their environment. This is made possible by the daily creation of new and more sophisticated AI technologies. Artificial intelligence is the capacity of a computer or computer-controlled machine

to perform tasks that are often associated with human intellectual processes, such as reasoning. While AIs are still unable to match human flexibility, in all domains or activities, requiring a great deal of common knowledge, certain AIs are just as good as humans in many areas [1]. Implications of AI technologies can be seen across every industry in today's time. In design related industries, "human creativity" as well as "the human touch" are the key aspects of new design creation as per human needs. However, AI tools support the professionals in the design industry in optimizing their work output. In the field of Interior Design, a space is designed as per human needs. Thus, human factors are of key importance in planning spaces and providing necessary functionality while keeping in mind the aesthetics. An interior designer's responsibilities include taking on a design project from start to finish, figuring out the client's objectives and project requirements, interpreting and translating client needs into rough plans, negotiating project costs and schedules, researching and selecting suppliers of products and materials, placing material orders, supervising the installation of design elements, collaborating closely with agencies, engineers, architects, and contractors, and researching and adhering to industry changes, evolutions, and best practices. [2]. Interior designers must balance two very different tasks: being creative, which requires a private workspace and dedicated time for work, and being a salesperson, which requires understanding the client's needs and being able to put together, present, and close a proposal into a profitable business opportunity. Therefore, an interior designer needs good listening skills, communication skills, technical knowledge, and management skills [3]. They have been using computer aided interior design for a very long time, in order to accomplish these tasks, but now the trend has shifted to using computer generated interior design work. Interior AI, REimagine Home, AI Room Planner, 5D Planner, Spacely AI, Dreamhouse AI, CoolAIid, Møbel, DreamStaging.AI, Oda Mood board, My Room Designer, DecorAI, RoomGPT, Interior Computer, AITWO.CO, Jife, Foyr Neo, Houzz Pro, Sketch Up, RoomSketcher, Midjourney and Decorilla are some AI applications available to support the work of an Interior Designer [4]. The AI tools provide work support to Interior Designers with features and services like of 2D and 3D space planning, generate design suggestions and virtual walk-throughs for clients, furniture, furnishings, accessories, and material selection, creating lighting designs, select colour schemes, provide personalization of ideas and concepts, rendering and generating images of designs, provide facilities to develop environment friendly and sustainable designs and estimate coats based on designs and materials [5]. The benefits of using AI tools are that it saves time, allows experimentation, boosts creative thought process, improves efficiency, helps minimize the costs, allows design personalization, helps manage time schedules and establish connections with agencies and suppliers [6]. AI tools are important for Interior Designers as it streamlines the design process, it improves client engagement and satisfaction and, due to emerging evolution in the field of artificial intelligence, it is necessary for interior designers to learn how to use it [7]. Though AI tools have numerous advantages, they lack the "human touch" and so sometimes there is lack of creativity, loss of control over design process and lack of emotional factor in the design [8]. Therefore, it is imperative to learn about the practices of interior designers regarding AI tools and problems experienced by them in using it for their work.

2. OBJECTIVES OF THE STUDY

1) To identify the extent of use of Artificial Intelligence tools by professional Interior Designers.

2) To find the extent of problems experienced by Interior Designers in adopting Artificial Intelligence.

3. REVIEW OF LITERATURE

The review of literature revealed studies on applications of AI technology in interior design [9], graphics, design style applications and modelling for interior design being transformed by computational and AI technology [10,11], evolutions and improvements in AI technology for Interior Design [12-14], impact of AI technology on field of interior design and interior design education [15, 16] and use of generative AI for interior design [17, 18]. It can be established that there was a dearth of studies related to practices of Interior Designers with regards to use of AI tools and problems experienced in adopting AI tools. Review also showed that widely used AI applications were Interior AI, RoomGPT, Foyr Neo, Houzz Pro, 5D Planner and SketchUp. A study, wherein, Interior design students were given an assignment to develop office designs for fictional characters from a TV show using Midjourney, an AI tool, it was found that AI is a powerful tool for interior design visualization, but it should be seen as a collaborator, not a replacement for human designers. As AI databases are further developed with more detailed information and real-world considerations, AI-generated designs will become even more sophisticated and functional [19]. Another study revealed that designers supported integrating AI with traditional design methods, acknowledging that some AI-generated designs might require modifications and over half the designers believe AI streamlined the design process, saved time and effort, enhanced design skills and imagination, and facilitated communication with clients [20].

4. METHODOLOGY

The type of research design used was descriptive. The city of Vadodara was the locale of the study. Practicing interior designers served as the inquiry unit for the present study. Using the purposive sampling technique, a sample size of 80 respondents was chosen. Included were the responders who used AI tools or technology. A questionnaire was employed as a research study instrument. Three-point scale was used to collect the know the extent of use of AI Tools and in section –III, Three- point scale was constructed to measure the problems experienced by Interior Designers in adopting Artificial Intelligence and for the both the scales the response structure was revealed in terms of “Always”, “Sometimes”, “Never”. Questionnaires were distributed to participants by using Google form, and respondents were informed that all opinions provided by them were kept confidential. A methodical approach was taken in gathering and documenting the data, and descriptive statistics such as frequency, percentage, and weighted mean were employed. The data were collected and categorized into demographic information, extent of use of AI Tools and problems experienced by interior designer in using the AI Tools.

5. FINDINGS AND CONCLUSIONS

5.1. DEMOGRAPHIC DATA OF THE RESPONDENTS

Information about the respondents' demographics is included in this section. It contains the respondents' personal information pertaining to the AI tools and technology they employ. The results pertaining to the respondents' personal

information encompassed their age, gender, level of education, annual income, type of work or employment, work experience, and projects completed.

Figure 1

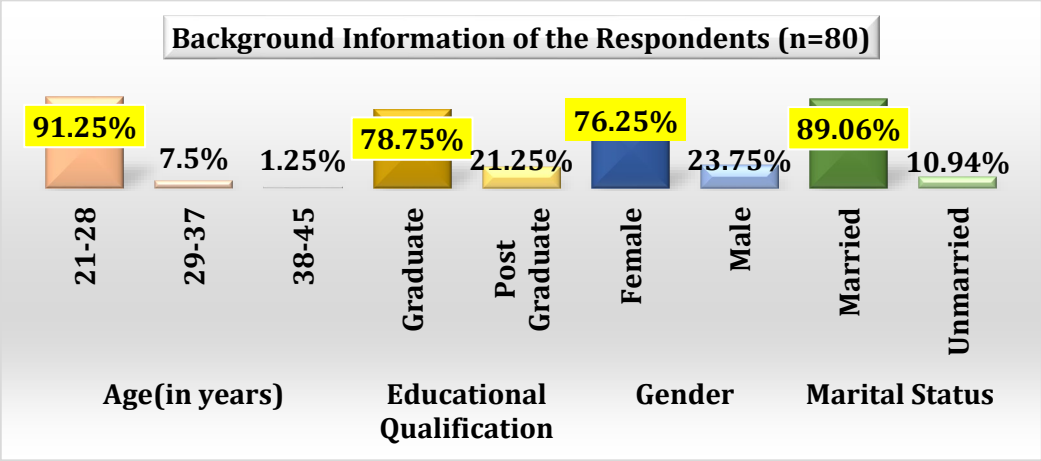

Figure 1 Personal Demographic characteristics of the Respondents.

The majority of respondents (91.25%) were between the ages of 21 and 28, according to Figure 1. According to the gender-specific findings (Figure 1), there were more female respondents than male respondents more than three fourth (76.25 percent) than male respondents. More than three fourth (78.25%) of the respondents had graduate-level education, according to the findings. The majority of respondents 89.06 percent were found to be married.

Figure 2

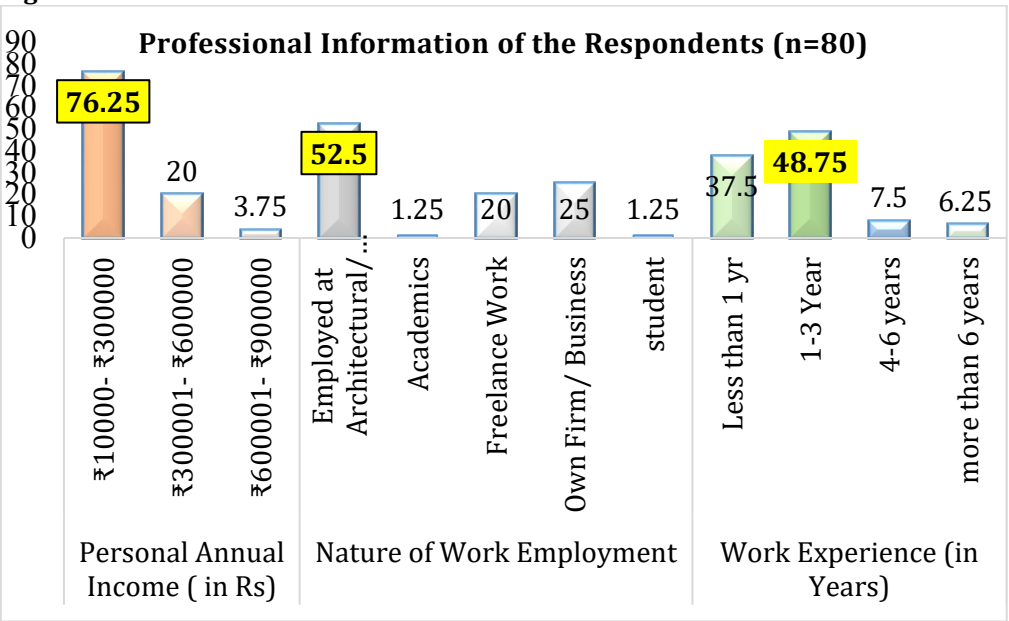

Figure 2 Professional Information of the Respondents

The data in the Figure-2 revealed that more than three fourth (76.25 per cent) of the respondents were having their personal income between Rs. 10000/- to Rs. 3,00,000/-. It was also found that more than one half (50.50 per cent) of the respondents were employed at architectural and Interior Design firms. From the

Figure 3 it was revealed that less than one half (48.75 per cent) of the respondents were having work experience between 1-3 years.

1) Extent of Use of Artificial Intelligence Tools by the Respondents

Figure 3

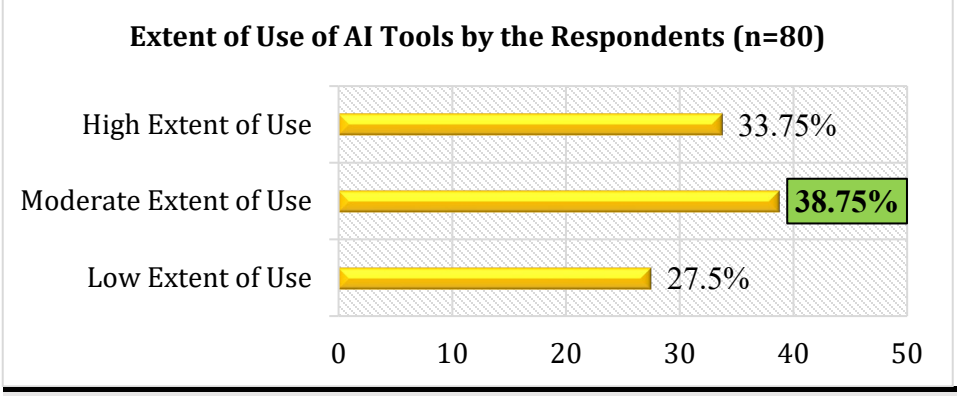

Figure 3 Extent of Use of Artificial Intelligence Tools by the Respondents

More than one third (38.75 per cent) of the respondents were always used AI Tools/Technologies to visualize perceived design ideas, to generate various layouts for design execution, to promote your work as an interior designer, to create 3D views of spaces, to create 3D views of spaces with components of specific brands were found at moderate extent (Fig. 3).

Figure 4

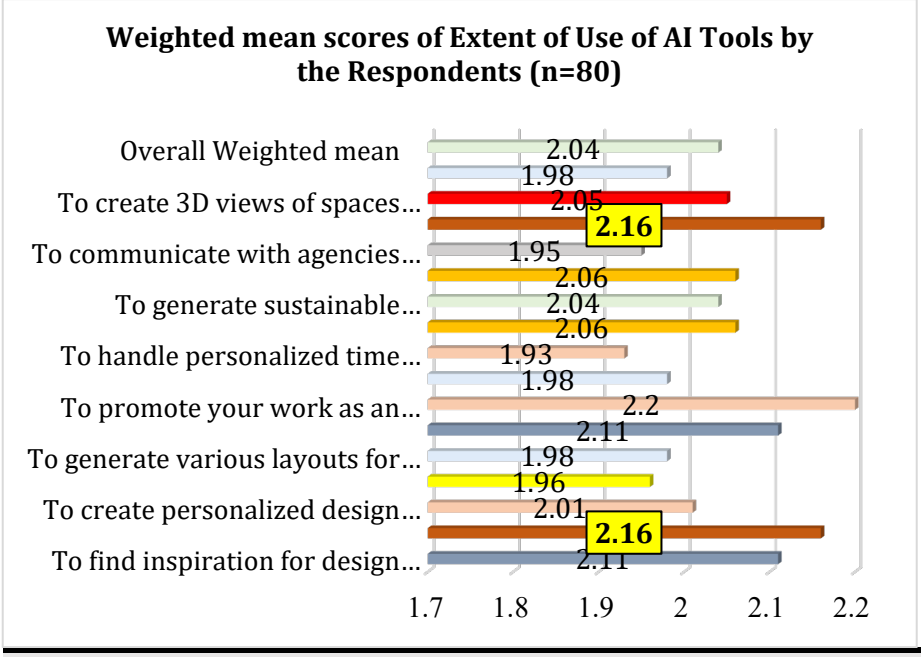

Figure 4 Weighted mean scores of the Extent of Use of AI Tools by the Respondents

The weighted mean scores for Extent of use of AI tools by the respondents reflected that majority of the designers use AI Tools for promoting work as an Interior Designer, and Secondly to create 3D views of spaces and to visualize perceived design ideas (Fig. 4).

2) Extent of Problems Experienced in Adopting AI Technologies by the Respondents

Figure 5

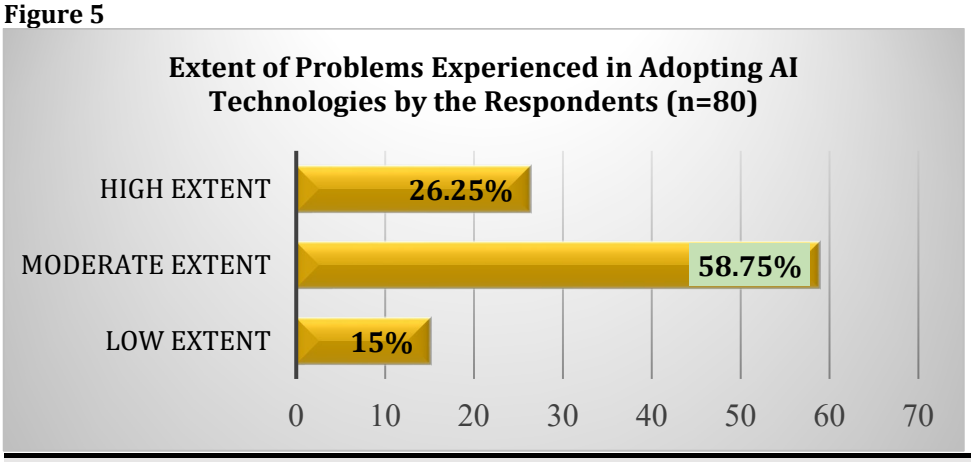

Figure 5 Extent of Problems Experienced in Adopting AI Technologies by the Respondents

More the one-half (58.75 per cent) of the respondents always experienced problems in adopting AI tools/technologies with regards to financial constraints, constant requirement of up gradation/ subscription/renewal, excessive storage requirement, application/software restrictions, outsourcing restrictions/issues were found at Moderate extent (Fig. 5).

Figure 6

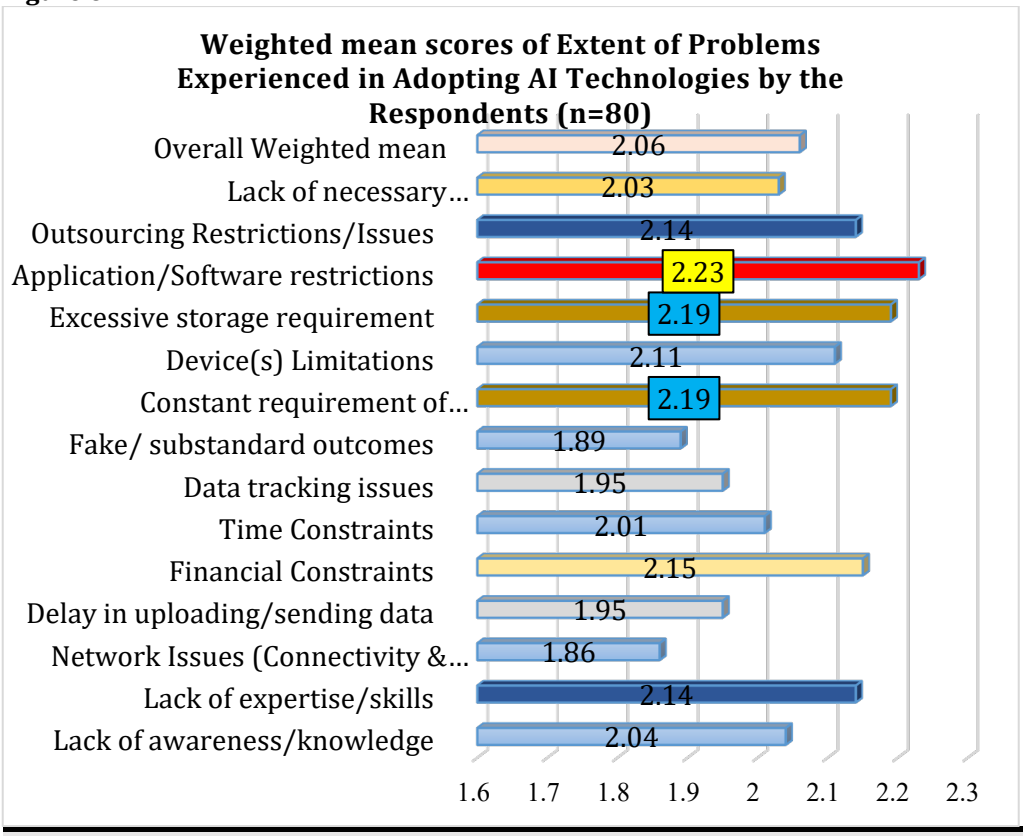

Figure 6 Weighted mean scores of the Extent of Problems Experienced in Adopting AI Technologies by the Respondents

The weighted mean scores for extent of problems experienced in adopting AI Technologies revealed that application /software restriction (2.23), excessive storage requirement (2.19) and constant requirement of up gradation, subscription/ renewal (2.19) were found to be the major problems experienced (Fig. 6).

6. CONCLUSION

The Findings on weighted mean scores on extent of use of AI tools reflected that most of the respondents using AI tools to promote their work as an Interior Design. Further it was also found that the Weighted Mean Scores on Extent of problems highlighted that application software's restriction problems experienced by the respondents. Based on the present study awareness programmes as well as skill development programmes can be organized for students of interior design to orient them regarding various AI tools and their use and applications. Advance level courses on popular AI tools can be planned for professional interior designers.

7. IMPLICATION OF THE STUDY

1) By researching into the diverse landscape of AI tools utilized within the industry and uncovering the challenges encountered during their implementation, this research equips individuals with valuable insights crucial for navigating the rapidly evolving intersection of design and technology.
2) For students, it offers a comprehensive understanding of the current AI, empowering them with knowledge of popular tools and an awareness of potential hurdles they may encounter upon entering the field.
3) For professional interior designers, it serves as a guide, providing practical insights into the real-world application of AI and offering foresight into the obstacles they may confront in adopting these transformative technologies.
4) Ultimately, this study not only enhances the awareness and understanding of AI within the interior design community but also fosters a more informed and prepared cohort of designers poised to leverage AI to its fullest potential while mitigating its associated challenges.

8. RECOMMENDATION FOR THE FUTURE STUDY

1) Based on the findings of the study, further investigation can be done regarding task-wise extent of use of AI tools and Technologies in the field of Interior Design.
2) The effectiveness of widely used AI tools and Technology in Interior Design Projects (Residential and Commercial) could also be studied.
3) Preference of Interior Designers for type of AI tools/technologies can be studied.
4) It is further recommended that more knowledge dissemination and skill development programmes should be organized for Interior Design Professionals regarding use of AI tools/technologies.

5) Conduct case studies and interviews with practicing interior designers who have implemented AI tools or technologies in their work

CONFLICT OF INTERESTS

None.

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