CHAPTER 76

Impact of Immersive Media on Buying Decision in Real Estate Market

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ABSTRACT

This research studies the impact of Augmented Reality (AR) and Virtual Reality (VR) on home-buying decisions in the real estate market. The study aims to find out how immersive media enhances consumer engagement, understanding, and confidence in purchasing properties. A structured quantitative method was adopted, using surveys and statistical tests such as t-tests and chi-square tests. The findings show that AR/VR provides improved property viewing experience compared to traditional brochures, increasing buyers' confidence and chances of purchase. The study suggests that real estate developers should add immersive media into their sales strategies to enhance consumer decision-making.

Keywords: AR; VR; Real estate; Home buying; Consumer behavior.

1.0 Introduction

The real estate sector is considered one of the primary drivers for economic growth that adds considerable value to GDP by development, construction, and sale of properties. It contributes approximately 6-7% to the GDP in India and is expected to be at 13% by 2025 with the rise in investments and demands. AR and VR, a new trend embraced by this sector to improve real estate marketing, brings to its fore the new visual experience with the help of virtual tours, immersive experiences, and 3D modeling.

In this way, buyers get to conduct virtual property explorations that assist in enhancing engagement and making decisions on purchases. AR/VR can quite effortlessly embed throughout the development cycle and has, to date, transformed the industry by bringing home-buying into the access and engagement area. This research attempts to assess how AR/VR influences buying behavior in customers and its implications in comparison with traditional marketing methods used in the real estate sector.

1.1 Objectives

AR and VR are changing real estate by providing virtual tours and digital views of properties.

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This makes buying homes easier and more engaging from anywhere, reducing the need to visit in person and helping people make better choices. It's a big step towards using more digital tools in real estate. The objectives of this thesis are as follows-

- To study the impact of immersive media on the buying decisions of a new property of customers.
- To study consumer perceptions for Conventional Methods (Brochures) and Immersive Media (AR/VR).

2.0 Literature Review

Several studies address how AR/VR affects decision-making and other marketing capacities; (Lee & Park, 2019) indicated that AR is of help during the constructability study of different construction practices because it provides better visualization and less error-prone execution. AR experiences create an emotional bond with properties, according to (Rauschnabel *et al.*, 2020). According to (Lou & Yeung, 2020), VR home tours have a strong impact on real estate buying decisions by showing properties. AI VR walkthroughs instill buyer confidence while helping them visualize properties, according to (Stein & Ramaseshan, 2021). (Beck & Rygl, 2019) found that emotional engagement was higher for VR technologies, and (Verhagen, *et al.*, 2022) sunders that even minimal immersive experience can change consumer choices. This concludes that AR/VR technologies are altogether reshaping the real estate industry with improved exploration of property sales, increased buyer confidence, and decision-making support. Future work should tackle the long-term effects of immersive media in real estate sales and behavioral trends of consumers.

3.0 Research Methodology

3.1 Research design

In This research we used quantitative research design to assess the effects of the influence of Augmented Reality (AR) and Virtual Reality (VR) on consumer behavior in real estate. By taking a structured approach, it allows statistically measuring of trends, correlations, and deviations in consumer perceptions and decision-making processes. This research is aimed at providing thorough insight into other research questions, for instance, whether AR/VR impacts decisions regarding home purchases and what demographic variables receive correlation from age, incomes, professions, and location in relation to its use.

3.2 Sampling design, questionnaire design and execution

Consumer behaviour and decision-making in real estate purchasing with immersive media (AR/VR) were researched through a structured questionnaire and sampling method. The survey gathered 205 responses, 151 of which were analysed, ensuring adequate demographic

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diversity and representation. Respondents were segmented into three generational categories with an emphasis on age analysis to evaluate technology adoption in AR/VR use by property buyers, with younger buyers from Gen Z and Millennials more inclined toward technology-enhanced exploration and settlements of properties. Based on this choice, respondents were additionally demarcated today by city-tier caving up to their technology exposure and purchasing ability. The operated survey segmented different property type demand (affordable, mid segment, premium, and luxury housing) with respect to income levels and the necessity of government subsidy. Further, the questionnaire comprised of two comparative assessments-one with traditional brochures vs. AR/VR demo videos. The study made comparisons regarding the property layout perception, understanding of space, design, and construction quality of the consumers' likelihood of purchase, and confidence in their decision-making based on the traditional techniques of evaluation using AR/VR demo videos further quantified by Likert scale-type answers.

3.3 Importance of the chi-square test in this project

In this study, a chi-square test was used to analyse the association between categorical variables: age group, city tier, and consumer behaviour-whether they are more inclined to buy a property or are confident-arising from the use of AR/VR influences or not, compared to traditional brochures. Specifically, the test is used to identify the relationship between categorical data and for analysing the responses of Likert scale survey questions once they are grouped into categories accurately. A t-test comparing AR/VR versus brochures, through differences in confidence in consumers and likelihood of purchase, also was conducted. Alternative methods that were applied in this study but later found unsuitable included Secretariat Regression, Kruskal Wallis H Test, and K-S Test. However, the appropriation of chi-square tests for association and then t-tests for mean comparison helped gain insight into how effectively AR/VR technology is assumed to have an impact on the decisions of buying a house as compared to traditional means.

3.4 Why the t-test is suitable for this project

As such, in the present study., the t-test was chosen as an important tool in comparing consumer perceptions between Conventional Methods (Brochures) and Immersive Media (AR/VR). Thus, it focuses on determining if indeed a statistically significant difference exists between the two formats in terms of influences on consumer confidence, purchase intent, and general engagement." The test takes note of and compares measured values to discern patterns relative to samples of differences, continuous data showing contrast over time, prior to statistical comparisons." Inferring, the findings indicated that even a small sample size of such scaled survey data could satisfy the normality assumption, hence making the t-test is an ideal tool because identification of meaningful differences regarding consumers' perception of AR/VR compared to traditional brochures would ultimately benefit real estate marketers and developers by enabling them to retool sales strategies and thereby optimize consumer engagement.

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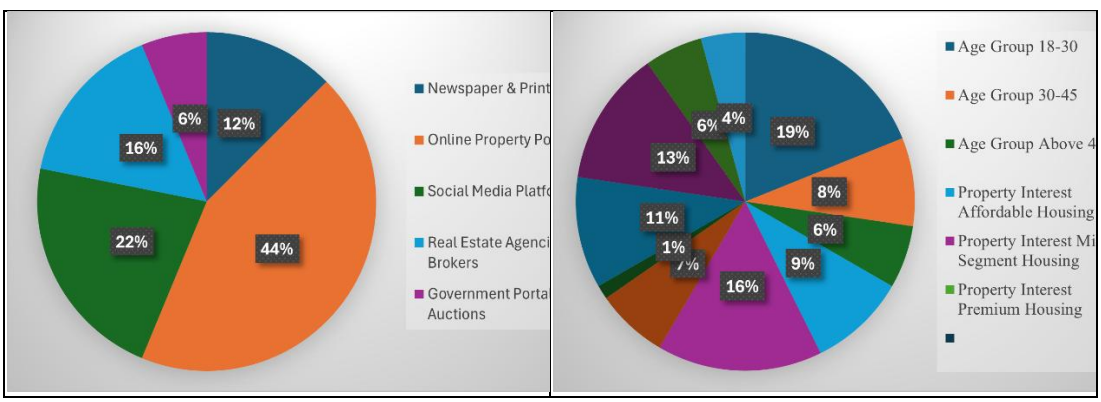
4.0 Data Analysis and Findings

In this chapter will express extensive analysis of survey data researching the influence of Augmented Reality (AR) and Virtual Reality (VR) on buying a home. The research endeavoured to measure the influence that these immersive technologies hold over buyer decisions in the real estate industry. Demographics and AR/VR adoption-related relationships were analysed using a method such as the chi-square test of association, whereas a t-test was used to compare responses obtained by consumers using traditional brochures to those attained by AR/VR experiences. The analysis included primary contributors such as consumer engagement, understanding of property, and decision-making confidence. The conclusions offer an insight into whether AR/VR does or does not emphasize the overall experience of buying a home compared to conventional systems. The analysis of data and statistical tests was performed using IBM SPSS and Microsoft Excel, which used the availability of data organization, tabulation, data visualization, and interpretation of trends.

Figure 1: Demographic Distribution of Respondents and Preferred Property Search Medium



4.1 T-Test for mean comparison

Table 1: T-Test Results for Conventional vs. AR/VR Methods

Variable Analysed	Mean (Brochure)	Mean (AR/VR)	t Critical two-tail	P(T<=t) two-tail
Understanding of Property Layout and Design	2.99	3.85	1.98	1.02807E-11
Confidence in Decision-Making	2.97	3.90	1.98	1.57887E-12
Perceived Quality of Construction	3.09	3.88	1.98	1.68532E-09
Likelihood of Purchasing the Property	3.03	3.94	1.98	8.02915E-11

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Interpretation of results: The p-values for all variables are lower than 0.05, the results show a statistically significant difference among the two methods. The higher mean scores for AR/VR across all variables indicated that immersive technology provides better property understanding, gives confidence in decision-making, improved perception of construction quality, and a stronger purchase decision. The large T-Values indicated that the differences observed between the two groups are statistically meaningful.

4.2 Chi-square test for association

Based on this question, the research hypotheses are as follows:

1. H0: There is no significant association between age groups and the likelihood of considering purchasing a property after experiencing it through the selected AR/VR medium. Ha: There is a significant association between age groups and the likelihood of considering purchasing a property after experiencing it through the selected AR/VR medium
2. H0: There is no significant association between age groups and the confidence provided by the AR/VR to make an informed property purchase decision. Ha: There is a significant association between age groups and the confidence provided by the AR/VR to make an informed property purchase decision.
3. H0: There is no significant association between the type of property a person is interested in and their likelihood of considering purchasing it after experiencing the property through the selected AR/VR medium. Ha: There is a significant association between the type of property a person is interested in and their likelihood of considering purchasing it after experiencing the property through the selected AR/VR medium.
4. H0: There is no significant association between the city tier where a person resides and how effectively they perceive the medium to convey the quality of overall construction of the property. Ha: There is a significant association between the city tier where a person resides and how effectively they perceive the medium to convey the quality of overall construction of the property.

Table 2: Chi-Square of Assosication Results

	Pearson Chi-Square	Likelihood Ratio	df	phi	Cramer's V
Hypothesis 1	29.581	27.57896018	8	0.44408	0.31400917
Hypothesis 2	32.147	28.3430499	8	0.46294	0.32734717
Hypothesis 3	7.467	8.986011302	12	0.22311	0.12881407
Hypothesis 4	15.649	17.39833557	12	0.323	0.18648168

The chi-square test for association was used to determine relationships between age group, property type, city tier, and consumer responses to AR/VR in home-buying decisions.

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The results indicate that age group and purchasing consideration are highly related, with a moderate association (Cramér's V = 0.314, p = 0.000). Younger buyers (18-30) showed a higher likelihood of purchasing after experiencing AR/VR, whereas older buyers (above 45) were more dubious. Similarly, age and confidence level were significantly associated (Cramér's V = 0.327, p = 0.000), showing that younger buyers trust AR/VR technology more than older individuals. Conversely, the type of property did not significantly influence purchase decisions through AR/VR ($\chi^2 = 7.467$, p = 0.825), indicating that property preference does not affect the impact of immersive media. Likewise, city tier and perceived construction quality were not significantly related ($\chi^2 = 15.649$, p = 0.208), suggesting that location does not determine how consumers perceive construction quality in AR/VR experiences. Overall, the findings indicate that age is a key factor in AR/VR adoption in real estate, while property type and location have minimal influence on the effectiveness of immersive media in home-buying decisions.

5.0 Conclusion

Findings from the research shows that AR/VR technologies play an important role in consumer engagement by providing immersive and interactive property experiences. Statistical analysis using t-tests indicate that AR/VR outperforms traditional methods in terms of property understanding confidence in decision-making, sensed construction quality, and purchase decision. Hence, the chi-square test of association points out that demographic factors influencing AR/VR adoption, with younger age groups shows more trust AR/VR in the home-buying process.

The results of the chi-square test indicate there is some sort of difference between the age groups in terms of their assurance in reliance on AR/VR when making property purchases. While participants in the younger age group (18 to 30 years) are confident in AR/VR providing sufficient information in their property purchasing process, participants from the older age group (above 45 years) show uncertainty or lower confidence. Businesses and marketers using AR/VR for property sales should design their approach based on age groups, as different segments display varying levels of trust in the medium.

There is further evidence that the current residence of a buyer does not affect his or her confidence in the use of AR/VR in the visualization of properties. Other findings show that while different property types may appeal more to specific buyers, the actual mode in which the individual experiences the property does not significantly impact his or her purchase decision according to property type.

This means that only the age group has a significant impact on understanding AR/VR as a medium, while the city in which a buyer resides and the type of property they are searching for do not have significant positive or negative influence on their decision. This suggests that AR/VR technology can be effectively used for all types of properties, regardless of location or property category.

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