Augmented Reality in Marketing: Exploring Applications and Impact with a Focus on Real Estate

Octavian Diaconu

Abstract: *Augmented reality (AR) is an emerging technology that overlays digital information and virtual objects onto the real world, enhancing users' perception of and interaction with their environment. This study explores the application of AR in the real estate industry, focusing on the use of AR in the presentation of interior design options to clients. By integrating AR into the marketing strategies of real estate developers, immersive and interactive experiences can be created, enabling potential homebuyers to visualize and explore different design possibilities in real time. This research is based on a qualitative approach, incorporating an in-depth interview with a real estate developer to gather insights into their experiences and perspectives on implementing AR in their marketing efforts. The interview provides valuable firsthand information on the benefits, challenges, and practical implications of using AR technology in real estate marketing. The findings emphasize the positive impact of AR in enhancing user engagement, improving visualization, and influencing client*

decision-making processes. This study contributes to the existing literature by offering practical insights into the effective integration of AR technology in real estate marketing, enabling developers to leverage AR to showcase interior design options and to create immersive experiences that resonate with their clients.

1. **Introduction**

Augmented reality (AR) is a key component of extended reality and refers to the integration of digital information and virtual objects into the real world, enhancing users' perception and interaction with these elements transferred from the virtual space to the real one. AR typically involves overlaying computer-generated images, videos, or 3D models onto the real world, either through a smartphone or a dedicated device.

According to a study conducted by Du et al. (2022) on the applications and effects of augmented reality in marketing, AR is recognized as an experiential marketing tool that provides immersive experiences to consumers, enabling interaction with virtual objects in real-world contexts. The authors highlight the ability of augmented reality to enhance product visualization, allowing consumers to experience products in a realistic and interactive manner.

Going beyond the limitations of traditional marketing media, AR facilitates informed purchasing decisions, allowing consumers to visualize how products would look or fit in their own environments.

The article emphasizes the positive impact of augmented reality technologies on consumer behaviour. It has been found that augmented reality experiences increase consumers' purchase intention, willingness to pay higher prices, and likelihood of recommending products to others. Additionally, augmented reality contributes to increased engagement, enjoyment, and product and brand satisfaction.

The authors also highlight the capacity of augmented reality to personalize and adapt marketing messages and offerings, thereby enhancing the relevance and efficiency of campaigns. Furthermore, the

emotional and sensory appeal of augmented reality is discussed. By incorporating elements such as storytelling and other interactive features, augmented reality experiences evoke positive emotional responses and enhance brand awareness. The authors highlight the viral marketing potential of AR campaigns, due to their innovative nature and entertainment value, leading to increased brand exposure and consumer involvement through social media sharing (Du et al., 2022).

Therefore, the authors emphasize the significant role of augmented reality as a marketing tool that enhances consumer experience, influences behaviour, and establishes a strong emotional connection between brands and consumers. They also suggest that future research should focus on understanding the mechanisms underlying the effects of AR on consumer behaviour, and should explore its integration with all the tools offered by extended reality.

2. Augmented reality in real estate

In today's ever-evolving real estate industry, the effective marketing of properties plays a crucial role in attracting potential buyers. Traditionally, real estate agents rely heavily on physical property visits and tours to engage potential buyers. However, these conventional methods often come with significant constraints related to time, costs, and logistics. In response to such challenges, augmented reality has emerged as a powerful tool to enhance marketing efforts within the real estate sector. By harnessing advanced visualization techniques, AR technology offers immersive and interactive virtual tours of properties, revolutionizing the way real estate agencies market their listings (Boiko, 2022).

AR integration into the real estate domain leverages its ability to provide realistic and comprehensive representations of apartments and houses. Through augmented experiences, potential buyers can virtually explore and interact with properties in a three-dimensional environment, gaining a deeper understanding of their unique features

and attributes. This innovative technology not only saves valuable time and resources but also empowers potential buyers to make well-informed decisions in their property search (Boiko, 2022).

The use of augmented reality in the real estate industry offers significant advantages, particularly in optimizing marketing efforts. By incorporating AR technology into their strategies, real estate agencies can provide potential buyers with captivating and immersive experiences, differentiating their properties from competitors' in a crowded market. The interactive nature of AR engages potential buyers on a deeper level, allowing them to forge an emotional connection with the property even before setting foot inside (Boiko, 2022).

Furthermore, AR technology provides valuable insights for real estate agencies through the analysis of user behaviour data. By tracking customer interactions during virtual tours, agencies can gather data on customer preferences and areas of interest. This information not only dictates marketing strategies, but also enables agencies to tailor presentations that resonate better with their target audience. By leveraging data analysis, real estate agencies can optimize their understanding of customer preferences and deliver more personalized and compelling marketing campaigns (Boiko, 2022).

3 . Expert sources consulted

Expert sources have been selected with careful consideration, aiming to incorporate insights from esteemed researchers who have contributed significantly to the understanding of consumer behaviour within extended reality environments.

One of the key sources I consulted is the study titled "Consumer Behavior Analysis in Extended Reality-Based Marketing" by Alcañiz, Rey, Tembl, Alcañiz and Zaragozá (2019). This study explores the potential of extended reality experiences in analyzing consumer behaviour. It investigates how marketers can observe and understand consumer navigation patterns and exploratory behaviour within virtual

spaces. By analyzing user engagement, attention duration, and the effectiveness of different elements within the virtual environment, the study provides valuable insights into consumer preferences, decision-making processes, and strategies for optimizing marketing efforts in extended reality environments. The findings of this study contribute significantly to our understanding of consumer behaviour in the context of augmented reality and extended reality.

Another important source for this study is the research conducted by Hoffmann and Mai (2022), titled "Consumer Behavior in Extended Reality Environments: An Empirical Analysis." This empirical study investigates various aspects of consumer behaviour within augmented reality, virtual reality, and mixed reality (AR/VR/MR) environments. By examining the impact of extended reality experiences on consumer perception, engagement, emotions, and decision-making outcomes, the study provides valuable insights into the cognitive, affective, and behavioural dimensions of consumer behaviour within extended reality contexts. The research findings contribute to a deeper understanding of how extended reality influences consumer preferences, attitudes, and purchase decisions.

By drawing upon the expertise and research findings in these selected sources, this section aims to provide a comprehensive analysis of customers' perception of augmented and extended reality in the realm of marketing. The inclusion of these expert sources enhances the credibility and validity of the present study, enabling a thorough exploration of consumer behaviour and informing on the development of effective marketing strategies in extended reality environments.

Extended reality technologies are proven to provide merchants with the opportunity of gathering valuable data and insights into how consumers interact with virtual experiences. By immersing users in extended reality environments, merchants can track and analyse consumer behaviours such as gaze patterns, movements, and interactions with virtual objects. These behavioural data provide

insights into consumers' preferences, interests, and decision-making processes when using extended reality technologies.

The study conducted by Alcañiz et al. (2019) highlights the fact that extended reality experiences enable merchants to observe and understand how consumers navigate and explore virtual spaces. By analyzing navigation patterns, merchants can obtain information about consumers' levels of engagement, attention span, and the effectiveness of different elements within the virtual environment. For example, merchants can assess which aspects of the extended reality experience capture users' attention the most, what elements prompt users to interact or make purchase decisions, and which areas of the virtual environment are frequently explored or ignored. This data allows merchants to refine and optimize their extended reality marketing strategies to align with consumer preferences and maximize engagement.

In addition to behavioural observations, extended reality environments enable merchants to track users' preferences and choices within the virtual space. By monitoring interactions with products or virtual scenarios, merchants can collect valuable data about consumers' preferences, prioritization of product features, and potential pain points. This information helps tailor marketing messages and product offerings to meet the target audience's specific needs and desires. For instance, analysing consumers' virtual interactions can reveal popular product configurations, preferred colour combinations, or desired functionalities. Such insights can dictate product development decisions and enable marketing agents to create personalized offers. By leveraging extended reality technologies, merchants can also measure emotional response and engagement level within virtual experiences. This can be achieved through the analysis of physiological data, such as heart rate, along with measurements of subjective experiences. Understanding consumers' emotional response in XR environments can provide deeper insights into their level of engagement, satisfaction, and brand affinity. Marketing agents can identify emotional triggers that generate positive

or negative responses, allowing them to refine their strategies to evoke the desired emotional impact (Alcañiz et al., 2019).

The importance of consumer behaviour in extended reality-based marketing is therefore crucial. These technologies offer merchants rich data on consumer interactions, navigation patterns, preferences, and emotional responses within virtual environments. By leveraging this information, merchants can optimize extended reality experiences, adapt marketing messages, and refine product offers to align with consumer behaviours and preferences. Understanding how consumers engage with and respond to extended reality environments enables merchants to create effective, personalized, and impactful marketing strategies that resonate with their target audience.

Hoffmann and Mai (2022) conducted an empirical study to delve into the complex realm of consumer behaviour in extended reality environments. Extended reality, which encompasses virtual reality (VR), augmented reality (AR), and mixed reality (MR), provides a unique and immersive platform for consumers to engage with products and to make informed purchase decisions. The study aims to investigate the impact of extended reality-based experiences on various aspects of consumer behaviour, such as perception, engagement, emotions, and decision-making outcomes.

Through a controlled laboratory experiment, participants were exposed to various extended reality scenarios designed to simulate realistic interactions with products. By manipulating elements such as product attributes, sensory cues, and contextual information within extended reality environments, the researchers sought to understand how these factors influence consumers' perception of products. The study examined whether extended reality technologies could enhance consumers' evaluation of attributes such as aesthetics, functionality, quality, or usability, and how their perceptions subsequently shaped their attitudes and preferences.

Additionally, the researchers examined the role of engagement in extended reality experiences and its impact on consumer behaviour.

Extended reality inherently provides an immersive and interactive platform that can enhance user attention and engagement. By assessing participants' engagement level using measures such as presence, flow, and interactivity, the study aimed to show how the engagement level influences consumers' attitudes, emotions, and subsequent decision-making outcomes. The findings reveal that higher engagement levels within extended reality environments lead to more positive evaluations of products, increased emotional arousal, and a greater likelihood of making a purchase or of expressing purchase intentions.

Furthermore, the study investigated the influence of emotions on consumer behaviour in extended reality. Extended reality experiences have the potential to evoke a wide range of emotions due to the heightened immersion and sensory stimulation they provide. By examining participants' emotional responses during extended reality interactions, the researchers aimed to reveal the relationship between emotional experiences and consumer behaviour. The findings demonstrate that the positive emotions elicited within extended reality environments are associated with favourable product evaluations, increased purchase intentions, and a higher likelihood of sharing the experience with others.

In terms of decision-making outcomes, the study explored how extended reality experiences could impact consumers' purchase intentions and actual purchase behaviour. The findings suggest that extended reality-based interactions may positively influence consumers' purchase intentions, by providing them with a realistic and engaging platform to evaluate products. Participants who experienced extended reality were more likely to convert their intentions into actual purchases, compared to those who engaged with traditional marketing channels. The immersive nature of extended reality experiences allowed consumers to feel more confident in their decision-making, reducing uncertainty and increasing their willingness to make a purchase (Hoffman & Mai, 2022).

Overall, Hoffmann and Mai's study (2022) highlights the significant impact of extended reality on consumer behaviour. Extended reality environments have the potential to enhance consumers' perceptions of products, increase engagement and emotional response, and positively influence purchase intentions and behaviour. By leveraging the immersive and interactive nature of extended reality technologies, marketers can create impactful and persuasive experiences that drive consumer engagement, shape perceptions, and ultimately lead to favourable consumer behaviour outcomes.

4. Research methods

The main research method employed in the present study revolves around an interview with a real estate developer, Mr. Cătălin Idita, on the use of AR technologies in the industry. The interview aims to provide a firsthand experience and insights into the potential of a mobile AR-based application called Furnify, which I created as a tool to enhance the online buying experience within the real estate context.

During the interview, the real estate developer had the opportunity to explore and interact with the features and functionalities of Furnify. This direct interaction with the application allowed him to assess its effectiveness in providing a seamless and immersive experience to potential buyers.

Furnify allows users to overlay 3D furniture models onto their own spaces, enabling them to virtually visualize and explore different interior designs. The discussion explores the benefits of Furnify in bridging the gap between online browsing and visiting physical properties, offering a novel and interactive way for potential buyers to envision and customize their future living spaces.

Furthermore, the interview includes the interviewee's experience with Furnify, considering aspects such as ease of use, interface intuitiveness, and overall functionality. His remarks and feedback as a real estate developer have provided valuable insights into the app's performance and its potential impact on customer engagement.

By conducting this interview with Mr. Cătălin Idita and by his exploring Furnify, I aimed to gather firsthand feedback and insights on the app's effectiveness in enhancing the real estate buying experience. His perspective as a real estate professional has contributed to a comprehensive understanding of the application's strengths, limitations, and opportunities for improvement.

The insights gained from this interview and from a real estate developer's experience with Furnify will contribute to the advancement of AR technologies in the real estate industry. These insights will provide valuable information on possible future developments and updates to the application, ensuring its alignment with market needs and enhancing its ability to revolutionize the online real estate buying experience.

The interview conducted with the real estate developer as well as his experience with Furnify serve as a valuable research method to explore the potential and challenges associated with integrating augmented reality into the real estate industry. The insights derived from this interview will foster growth, innovation, and continuous improvement in utilizing AR technology for the real estate sector.

5 . Results and discussion

During the interview, Mr. Idita, an experienced real estate developer, shared valuable insights and perspectives on the use of augmented reality technologies in the real estate industry. Mr. Idita expressed his interest in using digital channels, particularly online platforms and social media, to promote his business. He emphasized the importance of targeted advertising on platforms like Facebook and posting ads on industry-specific websites to reach a larger audience and increase the visibility of his projects.

The interviewee's experience with popular social media platforms like Snapchat and Instagram confirmed his knowledge of AR technologies. He acknowledges the interactive nature of augmented reality and values its potential to provide captivating user experiences.

Mr. Idita highlighted the ability of the Furnify app to provide potential clients with realistic visualizations of interior design options, ultimately saving time and resources for both buyers and himself. He emphasized the unique experience offered by augmented reality and its potential to enhance buyer engagement.

The real estate developer recognized the potential of augmented reality, especially in the pre-sales phase of a project, where clients often struggle to visualize the potential of a property and its interior design possibilities. By incorporating the app as a marketing tool, he believes Furnify could improve the marketing process, increase buyer engagement, and accelerate the sales cycle.

To further enhance the app's value in the real estate industry, Mr. Idita suggested including options for furniture customization and collaborating with different merchants to provide more realistic and localized options. Such customization would offer users a sense of personalization and would make the app more relevant to their specific needs.

The interviewee acknowledged the potential challenges some users may face due to limited technical knowledge. He suggested addressing this issue through in-app tutorials and intuitive guides. Additionally, Mr. Idita expressed his willingness to personally train clients in using the app, given its user-friendly nature.

When discussing the challenges related to implementing the app in real estate projects, Mr. Idita mentioned the importance of precise placement of 3D furniture models and the need for an extensive library of options in terms of style, dimensions, and materials. He also emphasized the importance of optimizing app performance and ensuring compatibility with different devices.

Looking into the future, Mr. Idita believes that augmented reality will play an important role in the real estate industry. As technology continues to advance and become more accessible, he anticipates augmented reality becoming a standard tool for property visualization and marketing. By offering interactive experiences, augmented reality

has the potential to enhance buyer engagement and streamline the decision-making process.

Overall, the interview with Mr. Idita highlighted his understanding of the benefits of augmented reality in the real estate industry, as evidenced by his interest in using digital channels for promotion and his positive assessment of the interactive and captivating experiences this technology can offer. His feedback has shed light on the potential of augmented reality in the industry and on the importance of addressing usability challenges to ensure widespread adoption.

6. Conclusions

This comprehensive and multivalent approach has facilitated a deep understanding of the implementation of augmented reality in marketing strategies. The interview conducted for this study has provided valuable insights into the practical implications of and opportunities for integrating augmented reality technology in the real estate industry. Additionally, the focus group allowed for an in-depth exploration of users' perceptions, experiences, and challenges related to augmented reality in the context of furniture purchases. The combination of these research methods and the inclusion of participants from diverse backgrounds have enabled a thorough examination of the findings, offering a holistic perspective on the potential of augmented reality in marketing.

Future studies could further investigate user behaviour, by conducting extensive research on user experiences with augmented reality. These studies should aim to explore users' preferences, motivations, and decision-making processes when interacting with augmented reality applications. By understanding the factors that influence user behaviour, such as realism, interactivity, and usability, researchers can provide valuable insights to optimize augmented reality experiences and increase user engagement.

Furthermore, exploring the long-term effects of augmented reality experiences on consumer behaviour, such as purchase intentions

and brand loyalty, could provide a more comprehensive understanding of the potential impact of augmented reality in marketing. This could be achieved through longitudinal studies that track user behaviour and attitudes over an extended period.

Incorporating artificial intelligence and machine learning algorithms into augmented reality applications holds great potential for enhancing user experience. Future research could explore the integration of artificial intelligence techniques to enable advanced functions, such as object recognition and recommendation systems within augmented reality environments. By leveraging these technologies, AR applications could provide users with personalized recommendations, real-time information, and contextual insights, creating a smarter and more intuitive shopping experience.

Future research should also encourage collaboration between the fields of marketing, design, and technology to harness the full potential of augmented reality in marketing. By bringing together professionals from different disciplines, such as marketing specialists, UX designers, application developers, and content creators, innovative augmented reality solutions could be developed, which seamlessly integrate marketing objectives with user-centred design principles. Such collaborative efforts can lead to the creation of comprehensive experiences that communicate messages effectively, captivate users, and achieve satisfying outcomes.

Augmented reality possesses immense potential as a transformative tool in the field of marketing. As technology continues to advance, augmented reality can revolutionize how brands connect with their target audience. By overlaying virtual elements onto the real world, augmented reality offers a unique and immersive experience that captivates users and enhances interaction with the brand.

However, it is important to acknowledge the limitations of this research. As the study focuses on a small segment, it may not fully capture the diverse perspectives and preferences of all consumers. Additionally, technological constraints, such as device compatibility and

challenges related to augmented reality implementation, can affect widespread adoption and the effectiveness of augmented reality marketing strategies.

Further research is needed to explore the long-term effects of augmented reality on consumer behaviour to optimize augmented reality experiences for different industries, and to develop robust frameworks for measuring the success of augmented reality marketing campaigns. As technology continues to evolve, continued exploration and innovation in augmented reality-based marketing will be essential for brands to stay ahead of the competition.

This research and the development of the Furnify application serve as contributions to the understanding and implementation of augmented reality in marketing. By harnessing the power of augmented reality, brands can create captivating and memorable experiences, establish stronger connections with their audience, and stimulate consumer engagement. With careful consideration of limitations and ongoing research efforts, augmented reality has the potential to reshape the marketing landscape and to unlock new opportunities for companies across industries.

References

Alcañiz, M., Bigné, E., & Guixeres, J. (2019). Virtual Reality in Marketing: A Framework, Review, and Research Agenda. Frontiers in Psychology, 10. https://doi.org/10.3389/fpsyg.2019.01530

Boiko, O. (2022, May 9). Augmented Reality (AR) in Real Estate - Guide with Examples. WeAR. Retrieved April 3, 2022, from https://wear-studio.com/augmented-reality-in-real-estate/

Du, Z., Liu, J., & Wang, T. (2022). Augmented Reality Marketing: A Systematic Literature Review and an Agenda for Future Inquiry. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.925963

Hoffmann, S., & Mai, R. (2022). Consumer behavior in augmented shopping reality. A review, synthesis, and research agenda. Frontiers in Virtual Reality, 3. https://doi.org/10.3389/frvir.2022.961236