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Real Estate Augmented Reality Marketing Media Strategy: Formgiving architectural design

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Abstract
Using real estate agents to advertise home has long been a common practice. Some developers use a scale model to reflect the design results as a physical model however, the production requires components that cost quite a bit of money and are not practical nowadays. Hence, this study attempt to uncover the challenge of using augmented reality in marketing. The design framework for using augmented reality in marketing is determined using User-Centered Design with a protocol design method. Tracking and context identification, sound, one contact, kinesthetic and sensory modalities are the five types of design criteria identified.

Keywords: Augmented Reality; Marketing Tools; Architectural design; User Centered Design

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1.0 Introduction

The integration of computer-generated elements, such as a photo or video overlay, into a real-world image using technological devices such as a smartphone, desktop, and glasses is referred to as augmented reality (AR) (Imbert et al. 2013; Lazim and Rahman, 2015). As a newer technology, augmented reality has numerous advantages in marketing. First of all, it can be less costly than virtual reality marketing while providing a humorous and entertaining element to marketing (Huang and Hsu Liu, 2014). Augmented reality is a powerful tool for brand interaction, innovative marketing, and events that help companies gain a competitive advantage. In marketing, augmented reality (AR) provides a competitive advantage by allowing companies to promote their products and services through an interactive experience in a real-world environment.

In summary, the use of AR technology in marketing can help sectors embrace the "Fourth Industrial Revolution", of which AR is one of the nine pillars, and promote new sustainable technologies while ensuring equitable and universal access to information and financial markets. Several design area has not been solve was identifying a suitable marketing kit content to promote a real estate property, the method of augmented reality applications being design for property development for attracting potential buyers and the approach of user centered design can benefits of incorporating augmented reality into marketing, By profiling user-centered design as mentioned by Anwar (2016), researchers can not only develop a functional prototype inexpensively, but through user research and usability testing, designers seek to better understand the goals people wish to meet through their use of a product (Siran et al., 2021)and; the ideal workflow of a product, and how people will accomplish various tasks in their interactions with that product (Chumiran et al., 2021).

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2.0 Real Estate Issues and Challenges

This study is limited to the topic of augmented reality for builder marketing kits. The study focused on identifying the design criteria for marketers, how it can help them to target potential customers, and the study organized an interview with some practitioners (industry experts) and non-practitioners (students) to collect important data for this research Ali et al. (2022).

Specifically, augmented technology software and AR smartphone applications aim to embrace the "Fourth Industrial Revolution," which includes AR as one of its nine pillars, and promote new sustainable technologies while ensuring equitable and universal access to information and financial markets. This will generate wealth, create jobs and ensure that societies around the world are stable and prosperous. Based on Sustainable Development Goal: industry, innovation and infrastructure, research into manufacturing applications using AR technology is a strong and growing area (Razak et al., 2022). The challenge is to design and implement integrated AR -supported manufacturing systems that could improve manufacturing processes and product and process development, leading to shorter lead times, lower costs, and better quality. AR Marketing allows a company to target customers more effectively and efficiently while expanding its market. In addition, the acceptance of AR among Malaysian consumers has been steadily increasing, as has the number of AR -related research projects in marketing. 2 main issues and challenge faced by real estate or property developer combined cost and marketing kit.

2.1 Big and Costly Property Miniature

First, it is difficult to build a marketing property miniature, developers require more trained workers, and the model itself might produce surplus tonnes stated by Briggs (2011), to build a marketing property miniature, developers require more trained workers, and the model itself might produce surplus tonnes. Moreover, some housebuilders are assuming suburban marketing imagery.

2.2 Obsolete Marketing Kit

Furthermore, most real estate investor avoid creative new ideas.(Adams, 2015). In order to overcome the difficulties and meet the challenges, the real estate enterprises must keep pace with the times, establish the marketing concept of modern enterprises under the guidance of scientific theories and use modern marketing techniques to formulate scientific and rational marketing strategies (Ming, 2019).

From the study, the researcher found that, AR, in general, is not popular enough as compared to VR, with only 44% of people in Malaysia knowing of its existence, due to the lack of a knowledge report. Moreover, it is relatively high in cost, compared to traditional marketing (Lazim and Rahman 2015). Hence, this study's goals is to identify an suitable way to market a real estate property using augmented reality in their marketing kit. It can be explore by analyze design criteria in Augmented Reality Application for property development which helps them in selling the current and future properties to prospective clients. Later, the development of augmented reality-based navigation system based on user centered design able to overcome both challenge and issue.

3.0 Mitigating Issues and challenges towards methodological potential

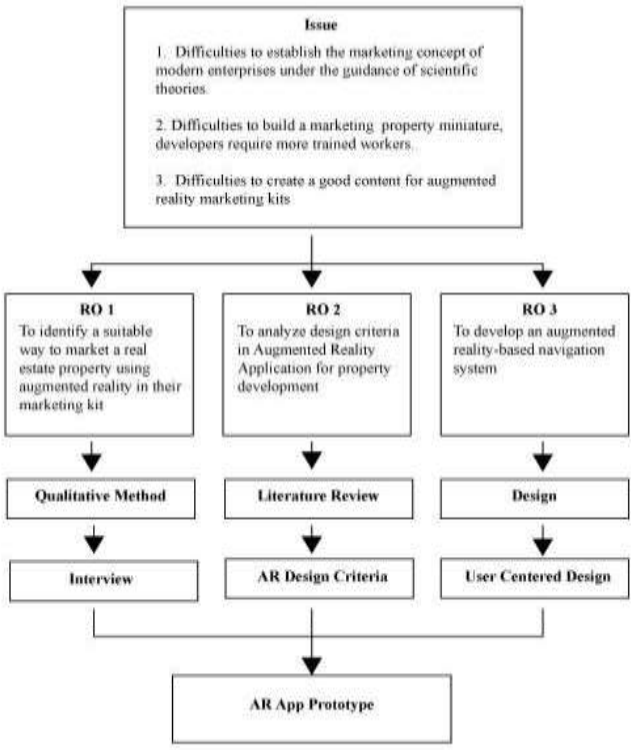

Fig. 1: Design research methodology

A researcher's research design is the framework for the methods and approaches they will use. Researchers can focus on research methods that are appropriate for the topic and set their studies up for success thanks to the design. A mixed methods approach was used in this study. A series of semi-structured interviews with key stakeholders (marketing property development staff and prospective clients) in the participating organisations and a literature review formed the first part of the study. A design for the development of a digital augmented reality application was also used.

This study employs two methods as shows in Figure 1. A face-to-face interview and the development of a prototype application for marketing tools. To begin, a user-centered design assessment and research study approach will be used to analyse all problem definitions and objectives. Following that, the collected data will be evaluated using secondary data or data collecting. Anwar et al. (2016) combine a systematical methodology in analyzing design activity. This research utilize the comprehensible and abilities of In-Vitro Design Protocol (IVDP) in mapping and analyzing design activities.

3.1 User Centered Design

User-centered design (UCD) is a set of procedures that puts users at the centre of product development and design. When a researcher creates digital goods, it considers the needs, goals, and feedback of the users. User requirements and desires become a top concern, and every design decision is assessed in terms of whether it adds value to the user (Anwar et al. (2015).

Empathize. An interviews were conducted for the purposes of this study. In depth interviews are structured, personal conversations with the goal of eliciting participants' emotions, feelings, and opinions about a certain research topic. Qualitative research interviewing is a linguistic practice and therefore a ' real world' challenge for applied linguistics, which is concerned with 'the theoretical and empirical investigation of real-world problems in which language is a central issue (Brumfit, 1995)

Define, The focus group method is a very important qualitative tool for exploring a particular topic which is exploratory. Five papers were identified where focus groups have been used as a primary method of data collection. The first was that focus groups should gather information in order to better understand and analyse how marketing people conducted their tasks

Ideate. According to Thom (1980), he devised a straightforward scheme. He separates the product development process into three stages: concept generation, concept acceptance, and concept realisation. Individual sub-phases and/or subtasks are grouped into these primary stages. Table 1 summarises Thom's approach.

Table 1. Summeries Thom's Approach

Stage of the innovation Process		
Main Stage		
Idea Generate	Idea Acceptance	Idea Realisation

Prototype. In interface design, prototypes serve a variety of functions. They're utilised to communicate with designers as well as users, developers, and managers, for example. Prototypes are also used to broaden the design area, create ideas, and conduct feasibility tests. In this project, the researcher devided the work frame into three, low fidelity, middle fidelity and high fidelity.

Test. With continuous iterations and user omnipresence - and the time and expense that entails - Frohlic and Sarvas (2011) defend the User-Centred Design method, even if they realise that this practise weakens the urgency of the technology and innovation market. Support statement by ISO 9241-210 This method improves efficacy, human well-being, accessibility, and sustainability while also taking into account the many implications that interactive systems might have on health, safety, and user performance.

3.2 Visual Analysis

Data obtained at baseline should be stable and change in a therapeutic direction when the independent variable is introduced, with at least three replications of effect across behaviours, situations, or persons (Gast & Hammond, 2010; Kennedy, 2005; Lane et al., 2007). Based on the stated hypotheses and research questions, researchers choose a visual display format that best depicts the study's goal (Spriggs & Gast, 2010). In this study, the researchers used three samples of mobile apps to examine design elements like as colour, transparency, and indicators to create visually appealing visualisations. The researcher from Table 2 demonstrates how the workflow follows the user-centered design and visual analysis method during project development

4.0 Developing a framework of design analysis and prototype strategy

In this section, the study will discuss each phase regarding User Center Design model and analyse the result from interview and visual analysis that have been done in previous chapter. User Center Design Model is utilized to evaluate the design and development process of the prototype only.

Due to the present scenario (Covid19), the interview was delivered both by hand and online to the general public and marketing personnel. There were a total of 5 usable answer gathered.

4.1 User Centered Design

Design Criteria. Ritsos et al. (2011), stated that in the middle of all of this, AR specialists are debating the necessity for standards in order to facilitate wider adoption of the idea and future innovation. He also added that, in theory, this framework of evaluation should be

applied to many scenarios and, via analysis, the underlying patterns and linked elements that impact the user's overall experience should be identified. This input can be separated in five major categories. Visual, Auditory, Tactile, Kinaesthetic and Sensory Modalities.

4.2 Visual Analysis

Any scientific activity lies inside a set of spatiotemporal and sociohistorical coordinates that condition and explain its methodological options stated by Aires (2015), She also referring to a new environment emerges for the researcher, who, as we all know, is much more attentive to what is going on around them, especially in qualitative research

4.3 Prototype

A comparative research found that Bowling and Frick's claim that a paper prototype lets users feel more comfortable critiquing the system is untrue. They also came to the conclusion that the amount of usability issues found is unaffected by the prototype technique used. The researcher will develop an augmented reality-based navigation system based on user centered design by bridging the gap between imagination and reality, augmented reality helps companies increase brand awareness, create a loyal consumer base, and engage with their audience.

Low Fidelity. A low-fidelity prototype is a rapid and simple tangible depiction of a concept, a use flow, or an information structure built for quick feedback and product improvement. These prototypes are often low-tech and can be made out of a number of materials, including sheets of paper, cardboard, glue, straws, and lego bricks, among others.

Middle Fidelity. The visual design can be improved by using a grid layout and paying close attention to alignment, font, and visual hierarchy. Text headlines, body material, captions, and sample images are examples of mediumfidelity content. You fill in the specifics and logic of the tale, frequently based on queries and observations from your user testers.

High Fidelity. Now that the prototype is in the unity software stage, with a title segment for each flow, it's ready to share with user testers as a clickable prototype. This can be done in person by observing your user tester as they travel through the prototype, or it can be done online via video conferencing.

Review/Test. From the prototype development, the researcher approach looks to be a viable strategy for providing high-quality application systems quickly. According to the research, the original prototype aided the development of a useful system by emphasising the creation of a user needs framework. The process also accommodated the frequent changes that users encounter in their dynamic world, allowing initiatives to focus on creating and extending rather than restricting and controlling. It provided users and designers with a realistic picture of the effort required to operationalize and maintain the system, allowing them to ensure a smooth functioning. This statement are support by Kraushaar and Shirland (1985), agreed that the prototyping methodology clearly has the potential to improve productivity over a wide range of applications

5.0 Proposed design process

5.1 Pre-production

Before production can begin, several processes must be completed. Pre-production is the term for this "problem-solving" phase. The researcher interviews a group of people to learn more about the problem. Augmented reality can be a time consuming and expensive art form, there is an entire company dedicated to these steps. The first parts of an interactive animation are included in the pre-production phase of 3D Augmented Reality. The concept, storyboards, and environment construction are all part of this process. After these steps are completed, the production pipeline for modeling can move into the production phase.

5.2 Production

After the framework for interaction has been established, the designs finalised, and the models created, the actual production can begin. This phase usually starts slowly and builds to a crescendo toward the end. The project should meet deadlines and budget requirements throughout production if sufficient attention has been paid to pre-production. User Centred Design (UCD) is done as part of the design process. Once designs are approved, technical production begins. Starting with asset modelling, the 2D design process transitions into the 3D process, which can be done in a variety of softwares such as Maya, Zbrush, and Lumion, depending on the platform for which the project has been customised.

5.3 Post-Production

Now that the modeling is complete, it is time to put the finishing touches on it. This modeling is sent to the Unity software programming station to match all the interactive elements. This phase also includes the final sound and music.

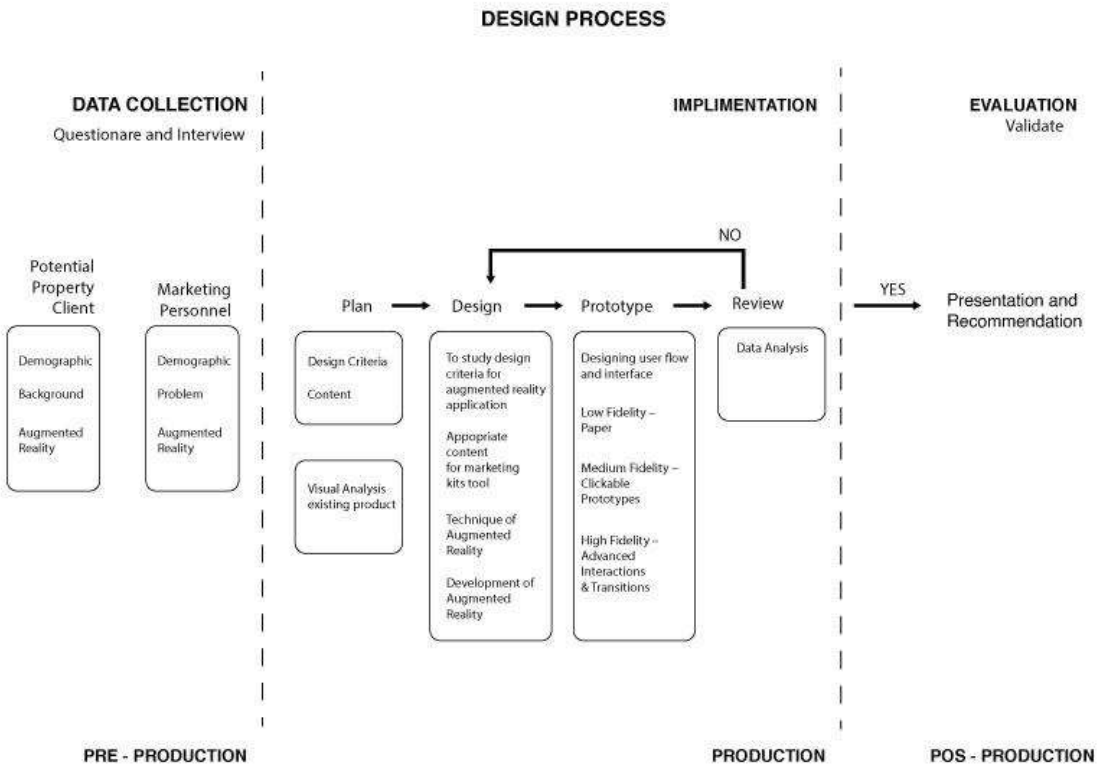

Fig. 2: Design Process and analysis strategy

Fig. 2 demonstrates how the workflow follows the user-centered design and visual analysis method during project development. [

6.0 Conclusion and future work recommendations

In conclusion, the purpose of this study was to identify the difficulties and drivers of using augmented reality marketing, as well as to investigate the future trend of AR marketing in Malaysia. The study's goals were met by identifying alternate scenarios that showed how the necessity for interrelationships between clients and marketing staff, as well as technological knowledge development, will influence and shape AR marketing in the future. Governments and activists both have crucial roles to play in promoting technology enablers while also stimulating societal demand. To bring AR marketing to the attention of society and encourage acceptance, a rigorous market penetration, product development, and commercial plan should be implemented. Naturally, a significant desire for interconnection between the virtual and real worlds, as well as the development of technological knowledge, will lead to a promising future for AR marketing in Malaysia. The requirement for interconnectivity is a direct result of technology's recognition and focus. The researchers hope that by completing this study, researchers will be able to increase user information retention, experience, and creative marketing practises in the future while lowering the issues that AR currently faces. AR marketing will become mainstream in the best-case scenario, since it will no longer be a spectacular new technology but a well-developed and extensively used one.

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