

Augmented Reality: A Systematic Literature Review and Future Research Prospects in Digital Marketing

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Abstract

To keep up with the new developments of the industrial revolution 4.0, aspects of modern society's life are increasingly strengthened by the combination of digital technology and reality. Augmented reality is a technology that overlays computer-generated images on a user's view of the real world. However, information about augmented reality in the context of digital marketing is still lacking, so it needs to be found to identify needs in research. Therefore, by conducting a systematic review of the literature, this article attempts to answer a key research question: What are the research gaps in augmented reality in digital marketing? This study is a review of the 5-year publication period from 2018 to 2022.

Keywords: *Augmented Reality, Technology, Marketing, Consumer behavior*

1. INTRODUCTION

In a marketing context, according to Kotler and Armstrong, there are four P components; product, place, promotion (advertising) and price geared towards successful marketing of the company's brand. With the prevalence of digital technology and advanced media, advertisers, marketers and promoters create advertisements promoting products that encourage consumers to pay attention, spend time, disseminate and absorb messages. However, as advertising messages are increasingly contested and pushed to be meaningful, advertisers struggle to increase consumer attention. Additionally, technological advances are enabling marketers to consider new approaches to audience targeting and interaction, such as augmented reality and virtual reality. In addition, thanks to advances in technology, marketing activities can now be supported by Augmented Reality. The goal is for potential customers to find the product that best suits their needs. Companies benefit from increased purchase motivation. Merchants can use this technology to provide customers with a real and memorable experience based on the merits of their product. Prospective customers have the ability to review the products they have purchased and make adjustments based on their preferences and needs from the augmented reality display that appears. This technology can also help salespeople explain the advantages of a product online and in person.

Thus, in marketing, augmented reality can be used to make people pay attention to products and improve their perception and memory, both of which increase the probability of making a purchase. However, despite the rapid advances in technology, empirical studies are often insufficient regarding the impact of augmented reality on consumer purchasing decisions. Consequently, the aim of this paper is to learn more about how consumer use of technology in marketing communications is affected by augmented reality, as well as to suggest areas for future research.

To get this description, the authors have conducted a Systematic Literature Review (SLR) study. By identifying, defining, and critically synthesizing the findings from all relevant, high-quality individual studies addressing one or more research questions, the SLR draws on an in-depth review of the prior literature on the issue. This review will provide comprehensive insights or perspectives on future research prospects in the increasingly important field of augmented reality

marketing and marketing communications by mapping out what is known. Consequently, the aim of this research is to answer the question "What are the research gaps in augmented reality in digital marketing?"

2. LITERATURE REVIEW

2.1 Augmented Reality Overview

Augmented reality is a technology that incorporates two-dimensional or three-dimensional computer-made objects into the real environment around users in real time (Ismayani, 2020). In its most basic form, augmented reality (AR) was developed by Ivan Sutherland in the 1960s and later used in information systems, machine maintenance and healthcare applications. A new perception is created as a result of this augmented reality (AR) technology, which allows users to interact virtually with real environments. Various advanced output devices are available for augmented reality to be displayed. Some of the devices in question are cell phones, webcams, cameras, glasses, screens, and head-up displays.

Marker-based and markerless AR experiences are the two most common experiences. Marker-based AR technology is in its infancy. However, for augmented reality (AR) applications, markerless AR is now the preferred method of image recognition. Marker-based AR applications use markers (target images) to display computerized content in the client's native climate. The location of the digital 3D content that the AR application will place in the user's visual field or via the camera feed is determined by this marker. Instead of using markers, markerless augmented reality uses real-world conditions to place virtual 3D objects in a physical environment. A system for tracking objects is unnecessary because of this difference. Markerless AR encounters are made possible thanks to improved cameras, sensors, processors and calculations prepared to discern and precisely plan today's reality. Users may be able to receive entertaining, significant and relevant information thanks to this technology. Using augmented reality to interact with various environments can lead to exciting new experiences. The widespread use of smartphones and other mobile devices has led to a significant increase in developer and business interest in augmented reality (AR). As a result, augmented reality is moving from the lab to the consumer market.

2.2 Digital Marketing Using 'Augmented Reality' Technology

The rapid expansion of the mobile market and advances in technology have made augmented reality a new marketing communications trend with several benefits. The retail industry can now use augmented reality. The use of augmented reality technology can meet the trend of how to buy goods by customers who want a direct experience online. To provide a new channel that can make marketing activities interesting, exciting and scalable, augmented reality integrates the benefits of traditional marketing and digital marketing. Technologies based on augmented reality can be applied to imaginative marketing efforts that send important, lasting messages. Furthermore, having a strong emotional connection with customers through the brand or product.

3. METHODOLOGY

This research is a literature review research. A systematic literature review aims to: identify the main theoretical aspects and key characteristics of publications in order to improve the quality of the review process and results by implementing transparent and reproducible procedures (Tranfield et al., 2003). Simply put, the process is concerned with identifying and evaluating a large body of literature. The studies are based on certain theories (Wolfswinkel et al., 2013) which allow researchers to identify gaps in the field and construct theoretical models with respect to the

emerging results. However, the scoping review must be comprehensive even though the quality of the research is not emphasized. Therefore, this method is considered the most suitable for the purposes of this paper because knowledge about augmented reality in digital marketing communications still needs to be deepened.

Authors also tend to incorporate an iterative sorting process to ensure no data will be excluded. According to Irshad and Rambli, iterative variety is used to get results that are most related to analyzing and perfecting iteratively to maintain research quality. Keyword filter is implemented to remove unclear or ambiguous search results by reviewing articles carefully during search. Articles containing augmented reality marketing are identified. Finally, researchers categorize AR publications based on marketing communications.

3.1 Process

Tujuan utamanya adalah untuk mengidentifikasi pandangan komprehensif tentang prospek penelitian masa depan dalam pemasaran augmented reality sehingga memberikan bukti untuk mengisi kesenjangan dalam penelitian. Tinjauan pustaka dalam penelitian ini dilakukan berdasarkan teori dari Wolfswinkel et al. (2013), yang terdiri dari lima tahap : define, search, select, analyze, dan present.

3.1.1 Step 1—Define

The first stage is defining the scope and database used. This article uses Augmented Reality as the main variable studied. The form of the article used in the review is a journal. The language used in the articles to be reviewed is English. The duration of the search for publications was determined and identified within five years from 2018 to 2022. This review utilizes databases that will be subscribed to the Airlangga University library in 2022, namely Scopus and Web of Science.

3.1.2 Step 2—Search

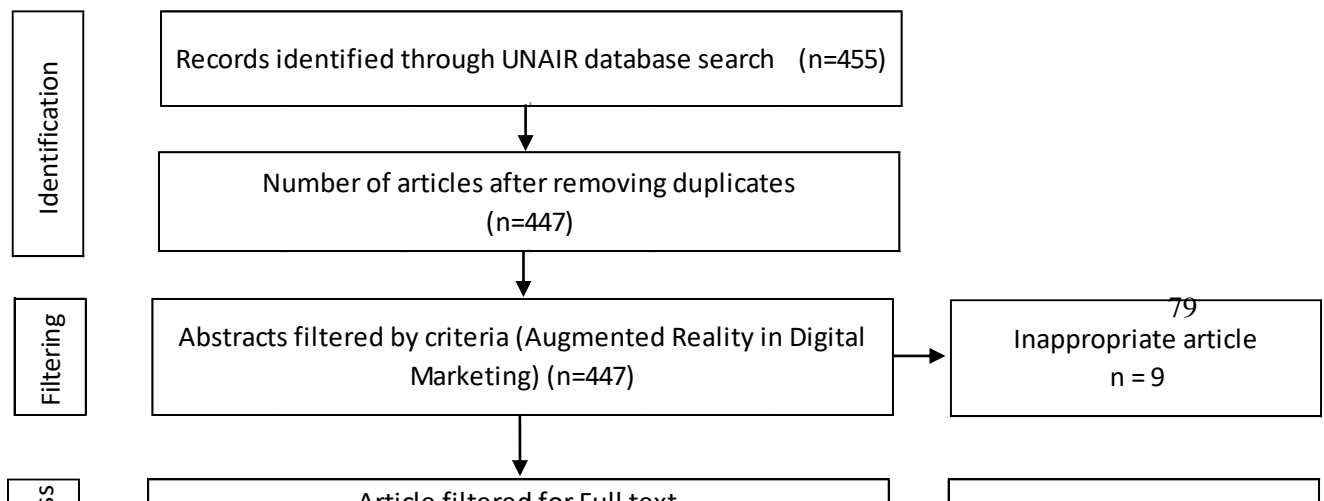
The second stage is the search for effective studies in the database that was determined in the previous stage using the keywords: "augmented reality in digital marketing". From the search results using these keywords, a total of 455 articles were obtained with the following details: Scopus (166 articles), Web of Science (289 articles) An initial brainstorming, focus context and literature search have been established at an early stage as an iterative process . Then, the research questions have been defined as:

What are the research gaps in augmented reality in digital marketing?

Research questions are set to help researchers provide an overview of future prospects in Augmented Reality Marketing.

3.1.3 Step 3—Selection

The third stage is the selection of articles to be analyzed. In selecting articles, reviewers use PRISMA as shown in Figure 1.



From the previous stage, 455 articles were identified, then reduced to 447 articles because there were multiple entries. From 447 articles, it was reduced to 438 articles because there were 9 articles that did not have full text available. Then it was reduced to 37 because it didn't fit the criteria. From 37 it was reduced to 15 articles because there were 22 articles that did not represent augmented reality in digital marketing. Thus 15 articles were included in the review.

3.1.4 Step 4—Assess

The assessment stage aims to examine and narrow down the articles by completing the quantity of documents that are relevant to the context study. The inclusion and exclusion criteria have been defined as follows :

First, screening is carried out by reviewing titles, journals and abstracts with the following inclusion criteria :

- (1) Studies that represent augmented reality in marketing
- (2) Journal

Furthermore, deep screening is carried out to exclude the number of articles with the following criteria:

- (1) Articles not written in English
- (2) Not available FullText

Thus, there are 37 articles found as relevant documents. However, after following the exclusion criteria, the number of articles was reduced to 15 articles.

4. DATA ANALYSIS AND RESULTS

4.1. Research Related to Advertising and Marketing of Augmented Reality

After assessing the documents, the next step is to synthesize and analyze the data. Data is tabulated into tables to calculate and view study trends (Table 1)

Table 1 Augmented reality digital marketing research 2018–2022

No	Author and Article Title	Year	Topic
1	Ye Zhu and Chong Wang Study on Virtual Experience Marketing Model Based on Augmented Reality: Museum Marketing (Example)	2022	Consumer decision making
2	Vera Zanger, Martin Meibner, Philipp A. Rauschnabel Beyond the gimmick: How affective responses drive brand attitudes and intentions in augmented reality marketing	2022	Consumer decision making
3	Ana Zagorc and Andrija Bernik Influence of Augmented Reality on Purchase Intention	2022	Consumer purchasing decisions
4	Khaled El-Shamandi Ahmed, Anupama Ambika, Russell Belk Augmented reality magic mirror in the service sector: experiential consumption and the self	2022	Consumer decision making
5	Akash Bajpai, Tajamul Islam Impact of augmented reality marketing on customer engagement, behavior, loyalty, and buying decisions	2022	Engagement, behavior, loyalty and consumer buying decisions
6	Kyung Hoon Kim, Eunju Ko, Sang Jin Kim & Qi Jiang Digital service innovation, customer engagement, and customer equity in AR marketing	2021	Consumer engagement
7	Anindya Widita, Hera Rachmahani, Ira Audia Agustina, Nisrin Husna The Use of Augmented Reality in Café's Interior to Enhance Customer Experience	2021	Consumer decision making
8	Shirin Gatter, Verena Hüttl-Maack, Philipp A. Rauschnabe Can augmented reality satisfy consumers' need for touch?	2021	Consumer decision making

9	Vaggelis Saprikis, Giorgos Avlogiaris, and Androniki Katarachia Determinants of the Intention to Adopt Mobile Augmented Reality Apps in Shopping Malls among University Students	2020	Consumer decision making
10	Minjung Park, Jungmin Yoo Effects of perceived interactivity of augmented reality on consumer responses: A mental imagery perspective	2020	Consumer decision making
11	Chris Hinsch, Reto Felix, Philipp A. Rauschnabel Nostalgia beats the wow-effect: Inspiration, awe and meaningful associations in augmented reality marketing	2020	Consumer inspiration
12	Philip A. Rauschnabel, Reto Felix, Chris Hinsch Augmented reality marketing How mobile AR-apps can improve brands through inspiration	2019	Consumer perception
13	Graeme McLean, Alan Wilson Shopping in the digital world: Examining customer engagement through augmented reality mobile applications	2019	Consumer engagement
14	Patrick van Esch, Denni Arli, Mahnaz Haji Gheshlaghi, Vicki Andonopoulos, Tania von der Heidt, Gavin Northey Anthropomorphism and augmented reality in the retail environment	2019	Consumer perception
15	Debika Sihi Home sweet virtual home The use of virtual and augmentedreality technologies in high involvement purchase decisions	2018	Consumer purchasing decisions

4.2. Variables in Digital Marketing Augmented Reality

Due to technological advances, especially the Industrial Revolution 4.0, the topic of marketing strategy has become very important in the industry over the last five years. It has been discussed and introduced by researchers and practitioners around the world. and purchase intention. that the Guilin museum AR Application was designed and developed using Unity as a software development tool and using the AR Foundation as an AR development framework. In Vera Zanger,

Martin Meibner and Philip A. Raschnabel placed affective responses, such as customer enjoyment and inspiration, at the center of decision making and conducted two online experiments to investigate empirically, although affective responses increased purchase intention and word of mouth either directly or indirectly. Indirectly through product/brand attitudes, AR do not guarantee a more positive affective response, instead they depend on the technical implementation of AR features and the customer's AR expertise. In Ana Zagorc and Andrija Bernik the use of augmented reality technology in the field of e-commerce, they wanted to determine whether using AR applications allows for a higher level of virtual presence compared to websites. In Khaled El-Shamandi Ahmed, Anupama Ambika and Russel Belk wish to characterize what using an augmented reality (AR) makeup mirror means for consumers, with a focus on experiential consumption and self-expansion. In Akash Bajpai, which presents the impact of augmented reality marketing on customer engagement and purchasing decisions. In Kyung Hoon Kim, Eunju, Sang Jin Kim and Qi Jiang which focuses on digital service innovation and aims to answer whether it plays a role in customer response and aims to answer whether it plays a role in positive customer response. They examine the relationship between digital service innovation, customer engagement and customer equity. In Anindya Widita, Hera Rakhmahani, Ira Audia Agustina and Nisrin Husna, they tested the perceived hedonic values and perceived uniqueness of customers towards the intention to visit the cafe. In Shirin Gatter, Verena Hutti-Maack, Philipp A. Rauschnabel, they explored whether AR could compensate for the lack of touch or vice versa, these consumers were skeptical because they craved more tangible input haptic output. In Vaggelis Saprikis, Giorgos Avlogiaris and Androniki Katarachia, they investigate an integrative theoretical paradigm that seeks to establish the significance of factors enabling the use of mobile augmented reality applications in shopping malls. In Minjung Park and Jungmin Yoo, examine the dimensions of perceived interactivity after experiencing shopping with AR and investigate the relationship between perceived interactivity and mental images and between mental images and other consumer responses in the context of mobile shopping. In Chris Hinsch, Reto Felix and Philipp A. Rauschnabel, outline the relationship of AR inspiration and show how psychological inspiration (i.e. inspired by) translates to behavioral inspiration (i.e. inspired to). The Lego Playground AR app was used to empirically test the hypothesis that “the wow effect” (awe) and nostalgia serve as important mediators for the inspirational process initiated by AR. Philipp A. Rauschnabel, Reto Felix and Chris Hinsch, presented and empirically tested a theorizing framework of how consumers perceive and evaluate the benefits and qualities of augmented AR applications, and how this evaluation drives subsequent changes in brand attitudes. In Graeme McLean and Alan Wilson, introduced a new set of augmented reality attributes, namely AR novelty, AR interactivity, and AR clarity and established their influence on the technology acceptance attributes of perceived ease of use, usability, enjoyment and subjective norms. In Patrick van Esch, Denni Arli, Mahnaz Haji Gheshlaghi, Vicki Andonopoulos, Tania von der Heide and Gavin Northey, the influence of anthropomorphism on consumer perceptions of AR in retail settings is still poorly understood. In Debika Sihi, explores the various impacts of digital technology, especially virtual reality (VR) and augmented reality (AR) features, at various stages of the EKB model in the context of high-involvement buying decisions. Additionally the use of the technology is examined as a competitive advantage for sales agents.

5. CONCLUSIONS AND FUTURE WORKS

SLR research aims to answer key research questions. Based on the SLR, the findings in the area of digital marketing settings have been detailed. The 15 articles in this review all cover the latest

technology. In general, augmented reality (AR) technology in digital marketing is still in its infancy, and there is still little research that requires new inventions to keep up with the industrial revolution 4.0. Data mining methods have been thoroughly described and used. As a result, according to the author, this SLR will support augmented reality in internet marketing. This study can be applied to both academic research and industrial approaches to AR. As such, future research should examine what makes AR apps fun, whether the inspiration triggered by using an AR app generates greater interest in AR in general. The interaction between AR, relationship and customer loyalty can be a useful variable for further research. Future research should examine the role of service orientation in digital service innovation and include customer characteristics as a moderator to gain broader insights. For future research, a heterogeneous sample will ensure that the observed relationships are similar across different demographic characteristics such as gender, age group, education, place of residence, occupation or family status. This can reveal additional evidence as to why expectations of effort, social influence, and facilitating conditions do not directly influence behavioral intentions, then relevant research can be conducted in other countries, focusing on attitudes of different cultures and drawing comparative data for cross-cultural studies. As Augmented reality becomes more common it will be useful to investigate different types of augmented reality features and different levels of AR such as low level vs mid vs high level augmented reality features.

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