

The Integrations with Augmented Reality Advertisements from the Perspectives of Vietnamese Consumers

Dinh Tien Minh^{1*}, Hoang Cuu Long¹, Truong Thanh Vy¹

¹ University of Economics Ho Chi Minh City - UEH, Vietnam

*dinhvienminh@ueh.edu.vn

Abstract: The advent of augmented reality is a dramatic technology change, contributing to closing the gap between reality and virtuality, becoming a promising marketing tool for brands. Despite other studies have found that augmented reality influences consumer responses and behavioral intention, little is known about how augmented reality influences consumer perception if it is integrated into fast-moving consumer goods advertising campaigns. This study surveys 14 respondents, divided into three groups, consumers, advertisers, and augmented reality service providers, to get insights on their perceptions and behaviors towards augmented reality -integrated advertisements. The study also employed quantitative research and questionnaires and coordinated the balance between the scales and a mass survey. 291 samples and descriptive statistics were done in this study. Some key findings from the research indicate that augmented reality interactivities positively impact consumer perception and behavioral intentions. The study also confirmed that young people, young millennials, and the first-generation Z are the most potentials because they have a high interaction with hi-technology and mobile devices. The result also shows that augmented reality can become a communication tool for Vietnam fast-moving consumer goods companies if applied strategically.

Keywords: Augmented Reality, Consumer Perception, Fast-Moving Consumer Goods Advertising, Descriptive Statistic, Vietnam

越南消費者的視角與增強現實廣告的整合

摘要: 增強現實的出現是一項巨大的技術變革，有助於縮小現實與虛擬之間的鴻溝，已成為品牌的有前途的營銷工具。儘管有其他研究發現增強現實會影響消費者的反應和行為意圖，但如果將增強現實融入快速發展的消費品廣告活動中，增強現實將如何影響消費者的感知知之甚少。這項研究調查了 14 位受訪者，分為三類：消費者，廣告商和增強現實服務提供商，以了解他們對增強現實集成廣告的看法和行為。該研究還採用了定量研究和問卷調查，並協調了量表和大規模調查之間的平衡。這項研究完成了 291 個樣本和描述性統計數據。該研究的一些關鍵發現表明，增強現實交互性對消費者的感知和行為意圖產生積極影響。研究還證實，年輕人，年輕的千禧一代和第一代 Z 的潛力最大，因為它們與高科技和移動設備具有很高的交互性。結果還表明，增強現實可以通過戰略性應用而成為越南快速消費品公司的溝通工具。

关键词: 增強現實，消費者感知，快速消費品廣告，描述性統計，越南。

Introduction

Received (date): August 25, 2020

About the author: Dinh Tien Minh, University of Economics, Ho Chi Minh City

Corresponding Dinh Tien Minh, E-mail: dinhvienminh@ueh.edu.vn

As Technology 4.0, Augmented Reality (AR) is applied more in practice and become more familiar to daily life. In particular, AR is one of the most leading technology trends in 2020 [10]. When marketing has gradually shifted from traditional marketing to digital marketing to bring a memorable brand and product experiences, AR-based marketing could have enormous value. AR helps consumers recognize every product more detailed and practical than the original information and provides product experience without direct interaction. Marketers assume that brand experience could be built comprehensively through AR and beyond physical interaction [37]. AR advertising campaigns are expected to break consumers' defense mechanisms and increase product or brand engagement. In marketing 4.0, the AR application in an advertisement is considered the latest breakthrough technology. Thus, AR integration is getting much more attention [10], [23]. Despite the increase in the number of brands using AR in marketing and advertising, there is not much intensive research about how AR contributes to advertising effectiveness, both internationally and nationally.

In terms of marketing, according to [8], the more positive beliefs correlated with a brand, the more positive each belief is. Besides, the easier it is for the consumer to recall the beliefs, the more beneficial the overall cognitive component is. Moreover, marketers are progressively accentuating to the affective or "feeling" component of attitudes to provide a richer understanding of attitudes than that based solely on the cognitive or "thinking" component [19]. In this study, researchers aim to review whether AR-advertising effectiveness is applied to Vietnam. Furthermore, it focused more on analyzing the impact of AR-integrated advertisements on consumer perception instead of consumer behavior. The highlights of this research are concentrating on analyzing a case study, which included more practical elements. Thereby, the research gets more customer insights, contributed more to the literature and practice. Specifically, the survey is conducted in the FMCG industry, in Ho Chi Minh City, Vietnam, which advertising market is very active [15].

Seen from the potential of applying AR in FMCG advertising, this study has been established for discovering consumers' responses about the changes in the level of consumer perception when interacting with FMCG advertising using AR. Since then, some recommendations could be suggested for Vietnamese FMCG enterprises to enhance advertising effectiveness through AR. That product category has a significant impact on consumer behavior. Due to the characteristics, customers could easily forget FMCG

products if there were no active marketing activities maintained [30]. Moreover, in the era of industry 4.0, consumer behavior has changed as the usage of social networks and mobile phones increase progressively [7]. Consumers are also more attracted to information, advertising, buying, and selling online [5], [36]. This has caused the FMCG marketing to gradually shift from traditional TVC and Trade Marketing to Digital Marketing, in which AR technology has a strong potential [9].

1. Theoretical background

1.1 The AIDMA to AISAS model transformation

Sugiyama and Andree [32] introduce the model of consumer behavior AISAS through The Dentsu Way. Setting this model side by side with AIDMA, it could be seen that the psychological transformation process ($A \rightarrow I \rightarrow D \rightarrow M \rightarrow A$) has been scaled down, and the last letter "A" for Action has been expanded into Search \rightarrow Action \rightarrow Share. Therefore, the model becomes Attention \rightarrow Interest \rightarrow Search \rightarrow Action \rightarrow Share. The AISAS process operates as a consumer notices a product, service, or advertisement (attention) and is intrigued (interest); after that, proceeds to collect information (searching) about the item in question. The search can be done online through personal blogs written by others, product comparison sites, and the company's official web pages or by talking with people who experienced that product or service, like family and friends [9], [10]. The consumer then makes an overall assessment based on the information gathered and information presented by the company, taking into consideration the opinions and comments of those who have purchased and used the product or service. If successful, that would turn into a firm decision to finally purchase (action) [6], [17]. After making a purchase, the consumer becomes a conveyor of Word-of-Mouth information by talking to others about the product or posting comments and impressions on the Internet (sharing). In contrast with the AIDMA model, AISAS represents a non-linear process. It does not necessarily move through each of the five stages, as showing in the Figure 1 below.

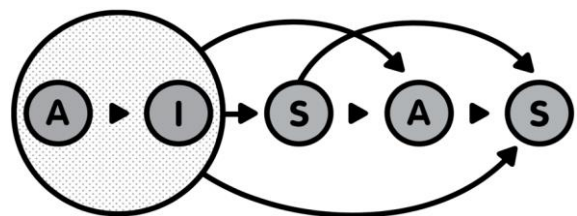


Fig.1 The non-linear process of the AISAS model

Source: [32]

1.2 Overview of Augmented Reality Technology

According to Azuma [1], Augmented Reality referred to a technology that virtual objects are added to the physical environment to replace corresponding objects from this environment. It created a new artificial environment [9], [16] to give the user a richer view of their reality. When reading the definition, Augmented Reality (AR) can be confused with Virtual Reality (VR). However, these two terms are entirely different in meaning. VR provides an entirely different reality compared with current reality, while AR provides an altered version of one's own reality [1]. In other words, one is still in his/her reality with AR. In 1966, the first AR prototype, called head-mounted display (HMD), was invented by Ivan Sutherland [33]. It presented 3D graphics by a see-through. In 1975, the videoplace was created by Myron Krueger, provided a room for users to interact with virtual objects for the first time. Later in the 1990s, the Augmented Reality term was officially established by Tom Caudell and David Mizell while helping workers assemble wires and cable for an aircraft. Until 1994, the reality virtuality continuum was defined by Paul Milgram, and Fumio Kishino described that AR is closer to the real environment. AR became a distinct field of research, which provided an opportunity for AR applications to be built rapidly.

Several surveys were done, giving users an overview of AR. Especially in 1997, Ronald Azuma [1] wrote the first survey in AR, providing a widely acknowledged AR definition by identifying it as combining real and virtual environments while being both registered in 3D and interactive in real time [35]. Also, at the same time, the GPS-based outdoor system was developed to assist the visually impaired in navigation with spatial audio overlays [18]. From that, computing and tracking devices started to support graphical overlay in mobile settings [23]. In 2000, the first outdoor mobile AR game, ARQuake, was developed by Bruce Thomas.

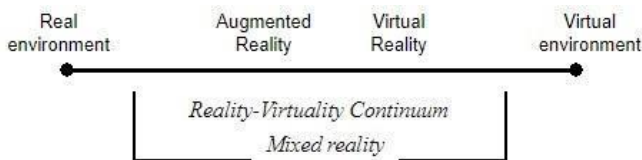


Fig.2 The reality virtuality continuum

Source: [18]

From 2005, the camera system became the standard for the AR system, analyzing physical environments in real time and related relation between objects and the environment [18]. Nowadays, Augmented Reality has appeared in almost every field, from education to entertainment [5], [23]. With more and more people working on it as well as investment from many billion-dollar companies such as Apple and Google, this technology will be a multi-billion-dollar technology [2].

1.3 Augmented Reality in Marketing and Advertising

Based on AR's features and how it affects cognition, AR is now becoming more prevalent within marketing and advertising since it allows businesses to craft experiences, engage consumers, and encourage conversions in fascinating ways. A study on "The Impact of Augmented Reality on Retail" with 1062 participants from 18-64 years old have shown several exciting findings. 71% of the participants would shop at a retailer more often than they offered AR, and 40% would be willing to pay more for a product if they could experience it via AR. A significantly high number of respondents (77%) wanted to use AR to see product differences, and 65% wanted to use AR to learn about additional product information [34]. According to a 761 XR professionals survey, they expected AR to be adopted by mainstream consumers by 31.8% within two years, 36.9% within 3-4 years. These numbers have partly stated that AR does affect how consumers react to brands and products (Marketing Charts Reviews [39]).

When it comes to driving sales, engaging consumers, and enhancing brand and product value [6], AR brings marketers and advertisers another tool. AR is capable of marketing strategies since it can quickly grab consumers' attention [3]. Furthermore, by bringing more personalized and memorable experiences, AR is a possible way to launch a new product, update, or pre-launch product. Unlike the old advertising techniques, advertisements using AR are more vivid and immersive and offer interactive experiences and an emotional connection with consumers [7]. Previous studies have indicated the overall positive impact of AR advertising on consumer perception and behaviors [4], [11], [24], [25], [31]. AR's potential is emphasized to capture consumers' attention and influence their purchasing behavior [21].

However, most of the prior research mainly focused on analyzing the AR impact on consumers' search, purchase intention, and purchasing behaviors [4], [24], [31]. They lack findings to explain the change in consumer perceptions when they interact with AR-integrated advertisements. Some researches showed the positive effect of AR integration on product knowledge. AR-integrated advertisements uniquely provided product knowledge in comparison with traditional advertisements [24]. Besides, AR did not succeed to generate higher overall product knowledge [12], [24]. Despite this limitation, AR still provided a more useful and enjoyable product experience. Many studies agreed that AR-integrated advertisements mainly drove the emotional and visual engagement to consumers [12], [24]. Therefore, customer attention and interest are increased [3], [10]. AR advertising has fundamentally changed the way consumers interact with products. [23], [26].

1.4 Augmented Reality Application Trends in Marketing

Advertisements applying AR allow consumers to see how virtual the products can be. AR provides the consumer with a personalized experience. Users can now interact with brands and their products in their context [17], [20], [27]. Along with the interactivity, AR offers a rich customer experience [22]. Moreover, applying AR is an easier way for a brand to immerse consumers in its advertisements. The organizational voice would thus be reduced. Technology giants such as Google, Facebook, etc. are gradually making the big step with AR [2]. For example, Facebook is expanding its playable and AR ads format. Michael Kors was the first brand to give Facebook's AR ads in the news feeds as a test. Their ads enable shoppers to try on sunglasses, change the product color, and make a purchase right on Facebook.

Marketers nowadays consider Augmented Reality a new tool that helps consumers engage along the marketing funnel, from awareness to purchase [6]. The top and middle (awareness to consideration) are the stages that brands are focusing on currently [29]. Each party's affinity for technology or understanding of Augmented Reality (considered field of experience) will also affect the message transmission process and message interpretation. Acknowledging each source's field of experience would offer a better way to reach out to consumers through AR ads or AR campaigns [13]. According to Jeremy Tucker, former vice president of marketing at Nissan North America, several third-party AR campaigns have recorded an average 19% increase in awareness of advertising [2].

2. Method and measurements

Through this study, the research objectives are to identify and analyze the change in perceptions and behaviors; analyze the transformation in the consumer behavior model when AR technology is applied. Thereby (1) Assess the likelihood of change in consumers' perceptions and behaviors when they interact with advertising campaigns applied with AR technology; (2) Analyze consumers' attitudes towards AR advertising campaigns; (3) Based on specific case studies which are limited to companies whose products are related to FMCG, assess the potential to increase the effectiveness of advertising campaigns which were applied with AR technology; (4) Propose recommendations that are specifically designed for advertisers, agencies and independent marketers, to promote the application of AR technology in the next advertising campaigns and simultaneously increase the effectiveness.

2.1 Sampling and Data collection

This study applies a mix-method. Firstly, qualitative research is used for deeper understanding and discovery of factors that affect the changes in consumer perception when interacting with AR advertising concluded from the case studies such as Nestlé Smoolatté: Nescafé From Tianyi With Love, L'Oréal Paris India, Beauty for All, Pepsi Max Unbelievable Bus, P/S the Adventure Of King Leo And Friends, Coca-cola Uplift Vietnam Through AR, Dutch Lady in Vietnam: Flying Farm, and Frieslandcampina's Yomost: Turning Yotime Into Valen-time. Qualitative research is done through focus group discussion and in-depth interviews to explore critical factors affecting consumer perception changes and collect rich data. The focus group includes nine people at the age ranging from 18 to 35 with diverse backgrounds. Each candidate takes turns to introduce themselves and address their knowledge and exposure to AR applied advertisements. Then, the moderator starts by asking discussion-oriented questions.

An in-depth interview is run with three experts with at least three years of experience in AR advertising and consumer perception. There also have two marketing experts with at least three years of experience participating in this interview. For supporting this study, in-depth interviews were conducted through direct discussions with a marketer from a publishing company whose one of the services is to provide the AR solutions for brands. Questions are adjusted and supplemented throughout the discussion process. The

researchers discuss with a marketer whose company used to provide AR solutions for its customers. First, researchers ask questions to consult the marketer about her assessment of the FMCG advertising market in Vietnam. After that, some AR advertising cases will be shown to the marketer to ask for comments on the potential of AR and its limitations when applying to the FMCG advertising in the Vietnam market. Finally, the marketers have some recommendations for Vietnamese enterprises planning to use AR in FMCG advertisements or advertising campaigns. The results obtained from the first step contribute to form the scale and serve for the second step, quantitative research.

All scales used in this study must be various and effective to measure the changes in consumer perception. There are three types of scale design chosen to build the whole questionnaire: (1) Nominal scale is used to categorize the responses into commonly exclusive subsets. This study is the demographic information (gender, age, occupation, monthly income, education attainment) and previous knowledge in AR technology and advertising of respondents; (2) Likert scale is used to measure customers' attitudes and behavior. The Likert scale indicates the extent of attitude to which respondents agree or disagree with a point, a statement about a subject. This study uses a six-point Likert scale from strongly disagree to agree strongly; (3) Semantic Differential scale (SDS) is used to measure a person's attitudes and feelings about a given object. SDS is unique because it includes bipolar adjectives (good/ bad; helpful/ unhelpful; high quality/ low quality, etc). SDS has two main components: the adjectives; the layout of the scale itself. Only two endpoints of the scale are labeled. This study uses a six-point semantic differential scale. This choice will allow respondents to express their opinions about given statements with only two contrast statuses.

Regarding the sampling method, the study uses quota sampling. The population is divided into strata by age and gender. Samples are taken from each group to meet a quota. In this way, the sample can be controlled for certain characteristics. Due to time and resource limitation, this study concentrates on consumers living in Ho Chi Minh City, Vietnam, more than one year, in the age range 18-35, divided into three subgroups: university students (18 - 24 years old), fresh graduates (25 - 30 years old) and experienced employees (31 - 35 years old). With age-group-ratio, the proportion is 40:30:30. The gender-ratio requirement is 50% male and 50% female. All of them could or could not be familiar with AR before. This study focuses on

homogeneous shopping goods so that the customer behavior of the population is also homogeneous. The proportion of 20% is chosen ($p=0.2$). The margin of error determines the level of acceptable risk in each sample that researchers are willing to accept. Thus, the study desired a 95% confidence level and 5% plus or minus precision. Z-value of 95% confidence level is 1.96, $p=0.2$. So, the sample size would be:

$$n_0 = \frac{(1.96)^2 \times 0.2 \times 0.8}{(0.05)^2} = 246$$

According to the central limit theorem, larger sample size will reflect a higher probability that the mean of any sample taken from the target population will be a close approximation of the real target population mean. Therefore, a sample size of 300 would be chosen to ensure data accuracy and reduce the impact of sampling errors.

The survey was conducted through face-to-face interviews with the survey forms prepared in advance and an online survey linked to the Google form attached in the email or texts on social networking sites. The total number of participants in the survey was 311 people. After eliminating invalid answers, the number of participants used in the official study was 291. In terms of the gender of the survey participants, the share of females was 52.6%, and the male ratio 47.4%. Considering the age, the number of people from 18 to 24 years old accounted for the highest proportion with 42.6%. The second-highest ratio was from the age group of 25 to 30 years old, accounting for 30.9%. The group 31 to 35 years old that accounted for 26.5%. The target age group from 18 to 35 accounted for the majority, which helped the study collect data appropriately and get more accurate results.

For the occupation, students and officers/employees accounted for the most significant proportion, 45% and 36.8%, respectively. Self-employed persons accounted for a lower proportion of 12%. Other occupations such as fashion designers, engineers, content writers, athletes, homemakers accounted for a ridiculously small proportion of 6.1%. Students and officers/employees accounted for a high proportion because these are two target customers who have the most complicated and most frequently changing purchasing behavior. Regarding the education attainment, respondents having university degrees accounted for the majority with 91.1%. The respondents with remaining education attainments of

Postgraduate, Intermediate/College, Junior High School/High School accounted for a minority, 4.8%, 3.1%, and 0.7%. Finally, the monthly income, respondents with a monthly income of fewer than 220 USD accounted for 33.7% of the survey participants. The second highest percentage is 23.4% of people whose monthly income fell into 330 – 660 USD. The groups have a monthly income in the range of 220 – 330 USD, 660 – 1,300 USD, 1,300 – 1,750 USD did not have a significant gap in percentage, 14.4%, 20.3%, and 5.8% respectively. Respondents having over 1,750 USD per month accounted for a tiny percentage of 2.4%.

2.2 Data analysis and measures

Due to this study's objectives, descriptive statistics analysis is used to deeply analyze changes in consumer perception when interacting with FMCG advertising via AR. Descriptive research is used for collecting quantitative data because it allowed researchers to compare the performance between questions and gain better consumer insights. The results will answer the surrounding five main research questions, as follows:

- ✓ How AR changes the way consumers interpret the message in FMCG advertising.
- ✓ Which communication channels work more effectively with FMCG advertising?
- ✓ Which AR types deliver a positive impact on consumers when interacting with FMCG advertising?
- ✓ How AR makes better product experience to consumers when interacting with FMCG advertising.
- ✓ Which further behavior intentions consumers would do after moving from attention to interest when interacting with FMCG advertising using AR?

Descriptive Statistics is mainly used for describing characteristics of sample data and show the quantitative analysis of the given set of data. The next step is translating data into graphical illustrations to communicate key research results generated from preliminary data analysis. The type of graphical illustration is determined based on the type of data: discrete or continuous. Discrete data includes questions using a nominal scale and ordinal scale in this research study. The frequency distribution table will illustrate frequency, percentage, a good percentage, and the cumulative percentage for each category of discrete variables. In this case, pie charts, bar charts, and line charts are used to visualize data. Continuous data in this research study are questions using a six-point Likert scale and Semantic differential scale, which lower number indicates lower frequency, and a higher number

indicates higher frequency. Data is analyzed through measures of central tendency and measures of dispersion. Measures of central tendency include mean, mode, and median. Shape statistics is skewness. The skewness indicates whether data distribution is symmetric. If most of the respondents have similar opinions, dispersion measures could be further used to determine how close between the distribution mean and the rest of the values in the distribution. Measures of dispersion include the variance, the standard deviation, and the range. The range is the difference of maximum value and minimum value. The smaller the standard deviation is, the more confidential the data is. Shape statistics is kurtosis, which measures whether data is distributed normally. The histogram presents it. Continuous data could also be illustrated like discrete data to point out the difference between answers.

There is one limitation when using descriptive statistics. The result just presents a limited picture of how customer behaving, not how a customer could behave or should behave. For the impact reduction, some questions about future behaviors are added to the questionnaire to make quantitative data results more reliable.

3. Descriptive statistic results

For this study's results, the data gathered from field research is presented following planned research concepts. From there, the study analyzes and evaluates the factors affecting consumer perception of FMCG when interacting with advertising applying AR.

3.1 Respondents' familiarity with Augmented Reality

Most of the respondents have heard about the definition of Augmented Reality. AR still seems new and not popular with Vietnamese FMCG consumers. However, some signs prove this technology is a potential and continuously can be developed in the future. Furthermore, this issue has already filtered out 81 respondents (accounting for 12%) that have never heard of AR before and have never been interacted with AR technology. Therefore, only 210 respondents answered the following designed research questions.

3.2 AR ads exposure in different communication channels

There has research question to the respondents, as "Where did you see AR advertisement?". The result ranked that social media is in the first place, next is a mall, purchasing places and billboards are the third and

last, respectively. The proportion of respondents who have ever seen AR ads in social media feeds was the highest, farther from other channels, accounting for 82.38%. Next, respondents were asked "How often advertisement on four communication channels (billboards, social media feeds, malls and purchasing places) is seen." The results show following similar channels as 22.38%, 82.38%, 43.33%, and 29.52%. These answers to this question could be considered as a reference for the effective communication channel to do AR advertising campaigns.

3.3 Frequency of seeing AR advertisements in different communication channels

Respondents (56.67%) said that they have never seen advertisements on billboards. About 29.05% of them have seen for one to five times. The rest count 14.29%, with higher frequency (more than five times). This result is reasonable and linked with the above table. Billboards are not popular with consumers. The recommendation is not needed to focus on and develop advertisements via this communication channel. The number of people who have never seen in the news feed of social media is small, just 4.76%. Low (for one to five times), high (more than five times) frequencies are 42.86% and 52.38%, respectively. The results conclude that consumers spend much time on social media and can access this channel easier.

There is not a massive gap in the frequency of seeing advertisements in malls. 32.38% of consumers have never seen them before. 40.48% of them have seen ads for one to five times. Only 27.14% of them have seen ads with higher frequency (more than five times). This result shows that malls are in the second place of effective channels. Respondents who have never seen AR-integrated advertisements account for 47.62%. Those, who have seen ads with low and high-frequency, count 33.33% and 19.05%, respectively. It can be concluded that purchasing places are not a potential channel behind billboards. For malls, the ratio between differences answer is balanced.

3.4 Elements in AR advertisements that influences consumer perception

3.4.1 Communication channels for AR advertisements

Ranking through results, the most exciting channels to interact with AR-integrated advertisements were malls, purchasing places, billboards, and newsfeeds, respectively ($4.526 < 4.412 < 4.275 < 4.199$). However,

the most convenient channels to interact with AR-integrated advertisements were malls, newsfeeds, purchasing places, and billboards, respectively ($4.423 < 4.282 < 4.241 < 3.924$)

3.4.2 Type of AR integrated into AR advertisement

Responding to types of AR integrated into FMCG advertisements is slightly more positive. Respondents were asked the level of interest and convenience when interacting with each type of AR (camera, AR-enabled app, and AR in-feed). Although the level of convenience is slightly lower than the level of interest, there was an evident variation in three types of AR for both levels above. Answers also had low standard deviation in comparison with the mean.

3.4.3 The benefits in driving consumers to download AR-enabled app

Seeing that the AR-enabled app was not in consumers' favor, the survey asked more about the AR-enabled app to discover more about which implicit benefit would drive consumers to download the app. Respondents can choose more than two benefits. The survey results showed that discount code/purchasing code/discount code after the experience was the most popular, accounted for 42.96% of respondents. Real products/gifts from brands after experience followed closely with 39.86%. There have two remaining answers that are no needed specific benefit and point-earning program after the experience. This is accounted for lower proportions of 12.03% and 5.05%, respectively.

3.4.4 The relevance in the level of identification, interest, and convenience related to social media and newsfeed on social media

Concerning social media, the combination of the result in the level of identification (through the question: "How often they have seen an advertisement on social media feeds?"), level of interest and level of convenience implied that although the ads had a very high coverage on the newsfeed. They received an average of interest and convenience. This could lead to the implication that an AR-enabled advertisement on this channel is annoying for users. Comparing analysis results in communication channels and types of AR, social media channels received lower interest and convenience compared to AR in-feed. This can be explained when combined with qualitative research results. For AR in-feed, users expect to receive support in product try-on and shorten consumer journey. So,

advertisements built with user support messages and focused on understanding products are likely to receive the highest support.

3.5 Level of absorbing the message when interacting with advertisements applied AR

3.5.1 Level of absorbing the message

In this part, respondents were asked about their evaluation of the message of AR-integrated advertisements. 35.4% of total respondents strongly agree that *"This type of advertisement enables us to build real images and products,"* leading this statement to have the highest mean (4.883). Other statements also have a moderate agreement: *"The authenticity of advertisements impacts my perception about the message,"* *"I have more emotions with the message from the brand when watching AR advertisements,"* which have a mean of 4.684 and 4.612, respectively. Two remaining statements received mean lower than 4.5, which are *"I think the message becomes more obvious and understandable thanks to applying AR,"* *"It takes less time to understand the message thank to applying AR."*

Respondents felt that AR-integrated advertisements built for real products, affecting their perception of messages and made them have more emotions with a message. However, they disagreed that the advertisement's message was more prominent, more understandable, and took them less time to understand. The frequent statistical analysis also declared that the feeling of clarity and perspicuity were evaluated in point 4 and 5 more (slightly agreed and moderately agreed), while others were evaluated mostly in point 5 and 6 (moderately agreed and strongly agree)

3.5.2 Elements of AR-integrated advertisements should be improved

The survey had a more in-depth analysis of which AR-integrated advertisements need to improve to bring better AR experience. The elements given are an image of the main product, background elements (frame, theme, animations, etc.), sounds, message content, font, and general color. The results showed that 80.41% of respondents believed that the main product's image is the most needed improvement, followed by message content, sounds, background elements (frame, theme, animations, etc.), general color, font. The percentages are 62.2%, 59.11%, 51.89%, 46.74%, 28.87% respectively. Four principal elements should be considered by advertisers when designing not only AR-integrated advertisements but also other advertisements.

3.6 AR-integrated FMCG advertisements provide better product experience

3.6.1 Customers' product experience in AR-integrated advertisements

In general, respondents have positive responses to the fact that AR-integrated advertisements provide them with better product experience. Every mean of each statement is more significant than four on a 6-point scale. They slightly agree that AR-integrated advertisements influence their product understandings, let them experience products as they are tangible, and drive them to have more experience with the products. They mostly agree that advertising's realisticsity also changes their perception of the product in a positive way. As for the statements *"AR-integrated advertisements help me experience products as they are tangible,"* *"AR-integrated advertisements drive me to have more experiences with products,"* and *"The realisticsity of the advertisements has an impact on my perception about the products,"* the data show that the respondents' tendency to agree is moderately high on average. Most respondents (respectively 35.4%, 35.1%, and 36.1%) agree at level 5 with the above statements.

As for *"AR-integrated advertisements affect my product understanding,"* this statement has most respondents choosing a rating of 4 (34.7%), showing that AR advertising affects consumers' product understanding but not significantly. Among these statements, *"The realisticsity of advertisements has an impact on my perception about the product"* received the most positive response with the highest mean (4.718) and the lowest standard deviation (1.052), proving that among the above factors of product experience, realisticsity of advertisement has the most significant impact.

3.6.2 Comparison in benefit received between AR-integrated advertisements and typical advertisements

When asked about the benefits received from AR-integrated advertisements compared with typical ones, the respondents replied positively about their presence. The results also show that AR-integrated advertisements bring new experiences to users. One of the factors, which is *"Experience more lively animations,"* received a high consensus (agree to agree strongly), accounting for approximately 70% of respondents. Besides, this factor has the highest mean of 4.914. This indicates that users are fully aware of the difference in this type of advertisement compared to typical advertisements and believe that providing an

experience with more lively animations for consumers is indeed a benefit that AR-integrated advertisements win over other advertisement types.

Besides, respondents also expressed a high agreement with the idea of *"being able to try on the product before deciding to purchase"* (32% agree and 22.3% strongly agree), proving their belief in the fact that AR-integrated advertisements would bring a more convenient experience in the purchase journey. However, as for the statement of which AR-integrated advertisements allow consumers to purchase more personalized products, it has the highest standard deviation (1.2773), which means the respondents have very disparate opinions about this statement, but still skewed to the agreeing side (25.8% slightly agree, 26.5% agree, and 23.4% strongly agree)

3.7 Next behavioral intention

3.7.1 Evaluating level of doing the future behavioral intention

As shown in the bar chart above, when asked about their willingness to spend more time experiencing AR-integrated advertisements, most respondents agreed with the statement "I can spend more time to experience AR-integrated advertisements" (30.7%). A high proportion of respondents slightly agreed and strongly agreed with the statement (27.5% and 20.3%, respectively). This result indicates that there are chances of consumers continuing to experience AR-integrated advertisements afterward. A significantly small number of respondents strongly disagreed with spending more time experiencing AR-integrated advertisements (1.4%). Respondents who disagreed and slightly disagreed with the statement also account for a minority (3.8% and 12.4%). The mean between opinions of this statement is 4.512 on the scale from 1 to 6, which results in a positive overall opinion on spending more time experiencing AR-integrated advertisements.

3.7.2 Belief in FMCG advertisements integrated AR in the future

It is clear from the information given in the pie chart above that the highest proportion of respondents believed that AR-integrated advertisements would soon become popular in the next 1-2 years (41.6%). Another opinion accounting for a very high percentage is the responses stating that AR would be popular in the next 3-5 years (39.5%). This finding shows very positive opinions about the future of AR-integrated

advertisements in the Vietnam FMCG market. Moreover, respondents seem to notice that AR is gradually making its way to consumers and becoming a trend in technology-based products and services. Roughly 8.2% of the respondents believed in AR-integrated advertisements' future in the next 5-10 years, while 3.8% of the responses went towards the 10-year potential. A small number of respondents stated that AR-integrated advertisements were just a temporary solution with low potential for development (4.1%). A minority of respondents did not believe in the future of AR-integrated advertisements and stated that it was just a temporary trend (2.8%). This would be of significant findings for the researchers to evaluate Vietnamese consumers' opinions about the future of FMCG AR-integrated advertisements in the upcoming years.

3.7.3 The correlation between the belief in producing more AR advertisements and the future of them in Vietnam

The majority of the respondents had positive opinions about whether Vietnamese entrepreneurs should produce more AR ads and the future of AR in the upcoming years. As shown in the bar chart, most of the respondents who strongly agreed that Vietnamese entrepreneurs should produce more advertisements applied with AR also believed in AR-integrated advertisements' future in the next 1-2 years and 3-5 years (15.8% and 15.5%). This result indicates that consumers are aware of the trend of AR as well as AR is likely welcomed soon in FMCG advertising.

4. Discussion and implications

In Vietnam, the FMCG industry, the application of technology in marketing and communications is considered a rising future trend with high potential [15]. The study also shows that AR technology is also considered a leading marketing trend that would go mainstream shortly. Therefore, AR's application to the advertising campaign has a positive impact on consumer perception for FMCG products. AR can enhance consumer emotions when interacting, which is convenient for FMCG products because it often incorporates emotional benefits with functional benefits [11]. With low brand loyalty, especially with some subcategories like processed foods and toiletries, bringing the real product image to consumers is not tricky in FMCG advertising [30]. Yet, promoting emotional relevance to consumers is still a problem that

requires businesses to continuously find creative solutions, especially along with hi-technology [17].

This study results also show a great opportunity in the packaging design when AR technology is applied to advertisements. Consumers tend to prefer AR via camera. They evaluate this AR type the most exciting and convenient for their experience according to the overall means of 4.801 for interest and 4.777 for convenience on the 6-point scale. When consumers have more choices and need to know more about the products they buy in terms of their provenance and ingredients [3], AR offers a new way to communicate these vital messages through spatial storytelling from-pack where physical real estate is limited. Thus, this is a significant potential for packaging design development. Enterprises could enable QR codes in packaging as well as invest more in packaging design if they want to apply AR technology to their advertising campaigns [11].

According to the study results, most of the respondents experienced more emotions and found it easier to understand the messages in AR advertisements. The overall mean of the agreement level on the 6-point scale is higher than the average mean ($4.62 > 3$). Respondents also gave positive responses to AR, offering them better product experiences according to the overall mean of the agreements (4.5). As shown in the results above, FMCG consumers seem to have positive reactions to AR advertisements. A high proportion of consumers also think that AR advertisement enables us to build real images and products. 4.833 is the mean on the 6-point scale. Moreover, the message content is the second most chosen one for factors affecting consumer's attitudes. AR has driven FMCG consumers to better perception about messages and products right after interacting with the advertisements. Several other factors also affect consumers' attitudes from the survey, such as sounds, the image of background elements (frame, theme, animations, etc.), and general color. Finally, respondents also express their feelings about what type of AR is used in the advertising campaigns. Regarding the AR type, interesting for consumers, the camera is at the top of the list with an overall mean of 4.801. It is also the type of AR that consumers feel convenient when interacting.

The survey has also shown that consumers' attitudes differ between communication channels. Malls are the most exciting channels to interact with AR-integrated advertisements with the highest overall mean on the 6-point scale (4.526). It is also the most convenient channel chosen by the respondents (4.423). On the contrary, billboards received a significantly low mean

compared to three other channels, which is 3.924. It is clear from the result that FMCG consumers have different attitudes towards different communication channels. Most respondents prefer discount code or purchasing code or discount code after the experience (42.96%). Real products or gifts from brands after the experience is the second favorite of the respondents. In general, advertisers and marketers should never ignore external factors since they can directly or indirectly affect consumers' attitudes toward AR advertising. According to the study results, a significantly high percentage of respondents spend more time experiencing AR advertisements (82.5%). Moreover, most of the respondents also agreed that AR advertisements impact their next behavior intention in the future.

In this study, the respondents agree that Vietnamese entrepreneurs should produce more AR-integrated advertisements (92.1%). A majority of responses also stated that FMCG consumers believed in AR advertisement's potential in the next 1-2 years (41.58%). It is clear from the findings that Vietnamese FMCG consumers have an interest in AR advertisements. They are aware of its trend in advertising as well as its potential in the upcoming years. This will be an essential factor for advertisers to consider when to take advantage of the potential of augmented reality.

5. Conclusion and further research

This study demonstrates the importance of augmented reality influences consumer perception in AR advertising campaigns, especially in the Vietnam FMCG industry. Some suggestions and implications have been proposed from these research results. These aim to Vietnam enterprises raising more awareness of their real marketing and advertising activities. The findings through this research imply that both Vietnam FMCG enterprises and agencies pay more attention to AR advertisements' role affecting consumer perception. It is clear that, in the era of marketing 4.0, the AR application in an advertisement is considered as the best breakthrough technology [10]. Thus, AR integration is getting much more attention in real business and people's real life.

This study has some limitations. In this study, demographic factors were limited to the areas from which the researchers could collect data. Respondents are from inner-city areas of Ho Chi Minh City, specifically, those who have lived in Ho Chi Minh City for one year or more. Although AR technology

appeared in the Vietnam market a long time ago and has been applied in many industries, in this study, we focus on FMCG products because of their familiarity and convenience for consumers. However, FMCG is exceptionally diverse with various sub-categories, with a short product lifecycle and a high daily use demand, so the products are also diverse. Their advertisements are not always able to provide users better product understandings even with AR applied. Thus, this research's limitation is that it does not show the full potential of AR when applied and popularized to users. Future research directions are needed to further research specific to each market; researchers are expected to expand the scope of research in each region across Vietnam. Besides, applied research is needed to focus on proposing solutions that support SMEs to apply this technology.

References

- [1] AZUMA R. T. (1997). A survey of augmented reality. *Presence: Teleoperators & Virtual Environments*, 6(4):355-385.
- [2] BONA C., KON M., KOSLOW L., RATAJCZAK D., and ROBINSON M. (2018). Augmented reality: Is the camera the next big thing in advertising? Los Angeles: Boston Consulting Group, April, 3.
- [3] BÖTTGER T., RUDOLPH T., EVANSCHITZKY H., and PFRANG T. (2017). Customer inspiration: Conceptualization, scale development, and validation. *Journal of Marketing*, 81(6): 116-131.
- [4] CEHOVIN F., and RUBAN B. (2017). The impact of augmented reality applications on consumer search and evaluation behavior [Student Thesis] CBS Copenhagen Business School, Denmark.
- [5] DACKO S. G. (2017). Enabling smart retail settings via mobile augmented reality shopping apps. *Technological Forecasting and Social Change*, 124: 243-256.
- [6] MINH Dinh Tien, LINH Phan Thi Yen, NHAN Ho Thi Kieu *et al.* (2020). Factors affecting consumer's bargaining behavior: The case of fashionable clothing. *Journal of Science of Ho Chi Minh City Open University*, 10(1): 62-70. doi: 10.46223/HCMCOUJS.econ.en.10.1.220.2020
- [7] EDWARDS-STEWART A., HOYT T., and REGER G. (2016). Classifying different types of augmented reality technology. *Annual Review of Cyber Therapy and Telemedicine*, 14:199-201.
- [8] HAWKINS D. I., and MOTHERSBAUGH D. L. (2010). *Consumer behavior: Building marketing strategy*. Boston: McGraw-Hill Irwin.
- [9] HILKEN T., DE RUYTE, K., CHYLINSK, M., MAH, D., and KEELING D. I. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, 45(6):884-905.
- [10] ISLAM A. (2020). The impact of augmented reality advertisement on customer engagement in the era of connected consumers. In: *Handbook of Research on Innovations in Technology and Marketing for the Connected Consumer*. Hershey, Pennsylvania: IGI Global, pp. 289-314.
- [11] JAVORNIK A. (2016). Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour. *Journal of Retailing and Consumer Services*, 30:252-261.
- [12] JENSEN G. (2013). *The effective use of augmented reality in advertising communications* [PhD. Thesis], University of Pretoria.
- [13] LANK, S., and BAJRACHARYA, S. (2018, December). Incorporating big data with iot in data center analytics. // *Proceedings of 2018 International Conference on Smart Systems and Inventive Technology, Tirunelveli, India, Dec. 13-14, 2018*. New York: IEEE, pp. 240-245.
- [14] LARSON M. G. (2006). Descriptive statistics and graphical displays. *Circulation*, 114(10): 76-81.
- [15] LONG H. C. (2013). The relationship among learning orientation, market orientation, entrepreneurial orientation, and firm performance of Vietnam marketing communications firms. *Philippine Management Review*, 20:35-40.
- [16] MARR, B. (August 13, 2018). Forbes. The 4th industrial revolution is here-are you ready. [Online] Available from: <https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-youready>.
- [17] MINH, D. (2015). The trend of showrooming and webrooming behaviors of the consumers in Ho Chi Minh City. // *Proceedings of the 3rd IBEA International Conference on Business, Economics and Accounting, University of Economics Ho Chi Minh City, April 15-17, 2015*, pp. 15-17.
- [18] MISTRY P., MAES P. and CHANG L. (2009). WUW-wear Ur world: a wearable gestural interface. // *CHI'09 Extended Abstracts on Human Factors in Computing Systems, Boston, MA, April 4-9, 2009*, pp. 4111-4116. URI: <http://hdl.handle.net/1721.1/61366>.
- [19] OLNEY T. J., HOLBROOK M. B., and BATRA R. (1991). Consumer responses to advertising: The effects of ad content, emotions, and attitude toward the ad on viewing time. *Journal of Consumer Research*, 17(4): 440-453.
- [20] OLSSON T., and SALO M. (2012, May). Narratives of satisfying and unsatisfying experiences of current mobile augmented reality applications. // *Proceedings of the 12th SIGCHI conference on Human Factors in*

- Computing Systems, Austin, Texas, May 5–10, 2012, pp. 2779-2788.
- [21] PANTANO E. (2014). Innovation drivers in retail industry. *International Journal of Information Management*, 34(3):344-350.
- [22] PARISE S., GUINAN P. J., and KAFKA R. (2016). Solving the crisis of immediacy: How digital technology can transform the customer experience. *Business Horizons*, 59(4): 411-420.
- [23] RAUSCHNABEL P. A. (2018). Virtually enhancing the real world with holograms: An exploration of expected gratifications of using augmented reality smart glasses. *Psychology & Marketing*, 35(8):557-572.
- [24] RASKA K., and RICHTER T. (2017). Influence of augmented reality on purchase intention: The IKEA Case[Online] Available from: <http://hj.diva-portal.org/smash/record.jsf?pid=diva2%3A1115470&dswid=-445>
- [25] RESE A., BAIER D., GEYER-SCHULZ A., and SCHREIBER S. (2017). How augmented reality apps are accepted by consumers: A comparative analysis using scales and opinions. *Technological Forecasting and Social Change*, 124:306-319.
- [26] SCHOLZ J. and DUFFY K. (2018). We ARE at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, 44:11-23.
- [27] SHANKAR V., KLEIJNEN M., RAMANATHAN S., RIZLEY R., HOLLAND S., and MORRISSEY S. (2016). Mobile shopper marketing: Key issues, current insights, and future research avenues. *Journal of Interactive Marketing*, 34:37-48.
- [28] SHARMA S. (2019). Descriptive Statistics, 4. (n.d.). Retrieved February 27, 2020, from <https://www.ahajournals.org/action/cookieAbsent>
- [29] SHEININ D. A., VARKI S., and ASHLEY C. (2011). The differential effect of ad novelty and message usefulness on brand judgments. *Journal of Advertising*, 40(3):5-18.
- [30] SINGH J. (2014). FMCG (Fast Moving Consumer Goods) An overview. *International Journal of All Research Education and Scientific Methods*, 2(6):58-60.
- [31] STOYANOVA J., BRITO P. Q., GEORGIEVA P., and MILANOVA M. (2015). Comparison of consumer purchase intention between interactive and augmented reality shopping platforms through statistical analyses. // *Proceedings of 2015 International Symposium on Innovations in Intelligent SysTems and Applications, Madrid, Sept. 2-4, 2015*. New York: IEEE, pp. 1-8.
- [32] SUGIYAMA K., and ANDREE T. (2010). *The dentsu way: Secrets of Cross Switch Marketing from the World's Most Innovative Advertising Agency*. London: McGraw Hill Professional.
- [33] TAMURA H. (2002). Steady steps and giant leap toward practical mixed reality systems and applications. [Online] Available from: <https://www.semanticscholar.org/paper/Steady-Steps-and-Giant-Leap-Toward-Practical-Mixed-Tamura/90a4abebbe509ec52c64809aee8986eee0973b7e>
- [34] *The Impact of Augmented Reality on Retail*. (2016, October 6). Retrieved February 7, 2020 from: <http://www.retailperceptions.com/2016/10/the-impact-of-augmented-reality-on-retail/>
- [35] VAN KREVELEN D. W. F. and POELMAN R. (2010). A survey of augmented reality technologies, applications and limitations. *International Journal of Virtual Reality*, 9(2): 1-20.
- [36] VUONG K. T. (2015). An exploration of the customer behavioral model for e-marketing strategy in Vietnam. *Review of Management Innovation and Creativity*, 8(23): 98-104.
- [37] YAOYUNYONG G., FOSTER J., JOHNSON E., and JOHNSON D. (2016). Augmented reality marketing: Consumer preferences and attitudes toward hypermedia print ads. *Journal of Interactive Advertising*, 16(1): 16-30.
- [38] MARKETING CHARTS REVIEWS [Online]. Available from <https://marketingcharts.knoji.com/>

参考文献:

- [1] AZUMA R. T. (1997)。增強現實調查。存在：遠程操作員和虛擬環境，6（4）：355-385。
- [2] BONA C., KON M., KOSLOW L., RATAJCZAK D. 和 ROBINSON M. (2018)。增強現實：相機是廣告中的下一件大事嗎？洛杉磯：波士頓諮詢集團，4月3日。
- [3] BÖTTGERT., RUDOLPH T., EVANSCHITZKY H. 和 PFRANG T. (2017)。客戶靈感：概念化，規模發展和驗證。市場營銷雜誌，81（6）：116-131。
- [4] CEHOVIN F.和 RUBAN B. (2017)。增強現實應用程序對消費者搜索和評估行為的影響[學生論文]丹麥 CBS 哥本哈根商學院。
- [5] DACKO S.G. (2017)。通過移動增強現實購物應用程序啟用智能零售設置。技術預測與社會變革，124：243-256。
- [6] MINH Dinh Tien, LINH PhanThiYen, NHAN Ho Thi Kieu 等。(2020)。影響消費者討價還價行為的因素：時尚服裝。胡志明市開放大學科學學報，10（1）：62-70。doi：10.46223/HCMCOUJS.econ.en.10.1.220.2020
- [7] EDWARDS-STEWART A., HOYT T. 和 REGER G. (2016)。對不同類型的增強現實技術進行分類。網絡療法 and 遠程醫療年度評論，14：199-201。
- [8] HAWKINS D. I. 和 MOTHERSBAUGH D. L. (2010)。消費者行為：制定營銷策略。波士頓：麥格勞·希爾·歐文。
- [9] HILKEN T., DE RUYTE, K., CHYLINSK, M., MAH, D. 和 KEELING D. I. (2017)。增強旁觀者的眼光：探索增強現實技術的戰略潛力，以增強在線服務體驗。市場營銷學院學報，45（6）：884-905。

- [10] ISLAM A. (2020)。互聯消費者時代，增強現實廣告對客戶參與度的影響。於：《面向互聯消費者的技術和營銷創新研究手冊》。賓夕法尼亞州赫爾希：IGI Global, 第 289-314 頁。
- [11] JAVORNIK A. (2016)。增強現實：研究其媒體特性對消費者行為影響的研究議程。零售和消費者服務雜誌, 30 : 252-261。
- [12] JENSEN G. (2013)。在廣告傳播中有效使用增強現實[Ph.論文]，比勒陀利亞大學。
- [13] LANK S. 和 BAJRACHARYA S. (2018 年 12 月)。在數據中心分析中將大數據與物聯網相結合。// 2018 年國際智能系統與發明技術國際會議論文集，印度蒂魯內爾維利，2018 年 12 月 13 日至 14 日。紐約：IEEE, 第 240-245 頁。
- [14] LARSON M. G. (2006)。描述性統計信息和圖形顯示。循環, 114 (10) : 76-81。
- [15] LONG H. C. (2013)。越南營銷傳播公司的學習導向，市場導向，創業導向和公司績效之間的關係。菲律賓管理評論, 20 : 35-40。
- [16] MARR, B. (2018 年 8 月 13 日)。福布斯第四次工業革命已經準備就緒。[在線]可以從以下網址獲得：<https://www.福布斯.com/sites/bernardmarr/2018/08/13/第4屆工業革命已經準備就緒>。
- [17] MINH, D. (2015)。胡志明市消費者的陳列室和網絡娛樂行為的趨勢。//第三屆 IBEA 國際商務，經濟與會計國際會議論文集，胡志明市經濟大學，2015 年 4 月 15 日至 17 日，第 15-17 頁。
- [18] MISTRY P., MAES P. 和 CHANG L. (2009)。WUW-wear Ur 世界：可穿戴的手勢界面。// CHI'09 計算機系統中人為因素的擴展摘要，馬薩諸塞州波士頓，2009 年 4 月 4 日至 9 日，第 4111-4116 頁。URI : <http://hdl.handle.net/1721.1/61366>。
- [19] OLNEY T. J., HOLBROOK M. B. 和 BATRA R. (1991)。消費者對廣告的反應：廣告內容，情感和對廣告的態度對觀看時間的影響。消費者研究雜誌, 17 (4) : 440-453。
- [20] OLSSON T. 和 SALO M. (2012 年 5 月)。當前移動增強現實應用程序的滿意和不滿意體驗的敘述。//第十二屆 SIGCHI 關於計算系統中人為因素會議的論文集，德克薩斯州奧斯汀，2012 年 5 月 5 日至 10 日，第 2779-2788 頁。
- [21] PANTANO E. (2014)。零售業的創新動力。國際信息管理雜誌, 34 (3) : 344-350。
- [22] PARISE S., GUINAN P. J. 和 KAFKA R. (2016)。解決即時危機：數字技術如何改變客戶體驗。商業視野, 59 (4) : 411-420。
- [23] RAUSCHNABEL P. A. (2018)。用全息圖虛擬地增強現實世界：探索使用增強現實智能眼鏡的預期滿足感。心理與市場營銷, 35 (8) : 557-572。
- [24] RASKA K. 和 RICHTER T. (2017)。增強現實對購買意願的影響：宜家案例[在線]可從以下網站獲得：<http://hj.diva-portal.org/smash/record.jsf?pid=diva2%3A1115470&dswid=-445>
- [25] RESE A., BAIER D., GEYER-SCHULZ A. 和 SCHREIBER S. (2017)。消費者如何接受增強現實應用程序：使用量表和意見的比較分析。技術預測與社會變革, 124 : 306-319。
- [26] SCHOLZ J. 和 DUFFY K. (2018)。我們在家：增強現實如何重塑移動營銷和消費者品牌關係。零售和消費者服務雜誌, 44 : 11-23。
- [27] SHANKAR V., KLEIJNEN M., RAMANATHAN S., RIZLEY R., HOLLAND S. 和 MORRISSEY S. (2016)。移動購物者營銷：關鍵問題，當前見解和未來研究途徑。互動營銷雜誌, 34 : 37-48。
- [28] SHARMA S. (2019)。描述性統計，第 4 頁。於 2020 年 2 月 27 日從 <https://www.ahajournals.org/action/cookie> 檢索
- [29] SHEININ D. A., VARKI S. 和 ASHLEY C. (2011)。廣告新穎性和信息實用性對品牌判斷的不同影響。廣告雜誌, 40 (3) : 5-18。
- [30] SINGH J. (2014)。快速消費品 (FMCG) 概述。國際所有研究教育與科學方法雜誌, 2 (6) : 58-60。
- [31] STOYANOVA J., BRITO P. Q., GEORGIEVA P. 和 MILANOVA M. (2015)。通過統計分析比較交互式購物平台和增強現實購物平台之間的消費者購買意願。// 2015 年國際智能系統與應用創新研討會論文集，馬德里，2015 年 9 月 2-4 日。紐約：IEEE, 第 1-8 頁。
- [32] SUGIYAMA K. 和 ANDREE T. (2010)。dentsu 方式：世界上最具創新性的廣告代理商提供的 Cross Switch 營銷的秘密。倫敦：McGraw Hill 專業人士。
- [33] TAMURA H. (2002)。邁向實用的混合現實系統和應用的穩步發展和巨大飛躍。[在線]可從以下網站獲得：<https://www.semanticscholar.org/paper/Steady-Steps-and-Giant-Leap-Toward-Practical-Mixed-Tamura/90a4abebbe509ec52c64809aee8986eee0973b7e>
- [34] 增強現實對零售業的影響。(2016 年 10 月 6 日)。取自 2020 年 2 月 7 日，網址：<http://www.retailperceptions.com/2016/10/the-impact-of-augmented-reality-on-retail/>
- [35] VAN KREVELEN D. W. F. 和 POELMAN R. (2010)。增強現實技術，應用和局限性的調查。國際虛擬現實雜誌, 9 (2) : 1-20。
- [36] VUONG K. T. (2015)。越南電子營銷策略客戶行為模型的探索。管理創新與創造力述評, 8 (23) : 98-104。
- [37] YAOYUNYONG G., FOSTER J., JOHNSON E. 和 JOHNSON D. (2016)。增強現實營銷：消費者對超媒體印刷廣告的偏好和態度。互動廣告雜誌, 16 (1) : 16-30。

[38]市場營銷圖評論[在線]。可從

<https://marketingcharts.knoji.com/>獲得