



Developing Augmented Reality to Improve Tourism Marketing in Indonesia

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Abstract

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This research aims to analyze the development of Augmented Reality (AR) as a digital marketing innovation in tourist villages in West Java. This research uses the Borg and Gall (2003) development model with quantitative and qualitative data analysis techniques. The research results show that this mobile-based AR is said to be feasible for use with an average feasibility test value of 78.7%. The implication of this research is tourist villages in promoting their tourism potential starting from tourist destinations to MSMEs. Apart from that, the presence of MSMEs can also encourage the potential of culinary tourism in tourist villages so that they can develop further following technological developments

Keywords:

MSMEs, augmented reality, digital marketing, tourist villages

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INTRODUCTION

In the current era of digitalization, collaboration is needed to increase the promotion of MSMEs in Indonesia (Mutamimah et al., 2023; Ajusta et al., 2022; Yacob et al., 2021). MSMEs are known as micro, small and medium enterprises. MSMEs are the business group that has the largest number (Aligarh et al., 2023). Apart from that, MSMEs are also a group that has proven to be resilient to various kinds of economic crises. Even so, the Covid-19 pandemic is one of the biggest challenges for MSME owners. From 2020 to 2023, various countries implemented policies to minimize the spread of Covid-19 by not allowing their citizens to travel outside the home and to other countries (Koeswahyono et al., 2022; Nursini, 2020). This condition has an impact on decreasing the number of sales from MSMEs. MSMEs in various countries are experiencing a decline in purchases and are at risk of going bankrupt (Kurniawan et al., 2023; Sornsenee et al., 2022). Therefore, MSMEs are required to carry out innovations that can help increase sales. Technological advances are a way out for MSMEs during the ongoing pandemic. Previous research shows that online-based technology such as social media can be used in the buying and selling process (Laily et al., 2022; Santoso et al., 2021). Generally, social media is used as a promotional tool for MSME products. The social media that are often used are Instagram and Facebook (Subiyantoro et al., 2022).

On the other hand, MSMEs are also innovating by using the marketplace as a place to make sales. These marketplaces are Tokopedia and Shopee (Dwijayanti et al., 2022). The use of marketplaces is carried out by MSME owners as an effort to minimize losses that occur. Previous research also explains that the use of social media and marketplaces provides promotional cost efficiency (Prutami, 2022; Ariyana et al., 2021). In Indonesia, the Ministry of Tourism and Creative Economy carries out various trainings to support



MSMEs to remain empowered. One of the trainings is the use of technology in product promotion to increase the creativity of MSME owners. Unfortunately, the use of social media, marketplaces and training provided by the government has not been accepted equally by MSMEs throughout Indonesia. So, assistance in developing online marketing networks for MSMEs in villages needs to be developed.

Cisaat Village is one of the villages in Subang district, West Java. Since 2016, *Cisaat* village has been designated by the Regent of Subang as a tourist village. Apart from that, based on West Java Open Data (2021), the number of MSMEs spread across the Subang Regency area in 2020 was 215,859 units. Then, in 2021 the number of MSMEs in Subang Regency will reach 229,215. This shows an increase of more than 13,356 units. The culinary business sector is ranked first based on the type of business category. In 2020, the number of MSMEs in the culinary sector reached 2,108,627 units. Then, there was an increase in 2021, with the number of culinary units reaching 2,239,092. Apart from culinary, businesses in the food sector also reached 1,542,276 (in 2020) and increased to 1,637,701 (in 2021).

To further increase sales in *Subang* Regency, especially in *Cisaat* village, it is necessary to increase information and promotional media to attract public interest from both Subang Regency and outside the district. By utilizing technology that has developed very rapidly, especially with the increasing use of the Internet on mobile/cellphone devices, the researchers propose the development of digital marketing innovations based on augmented reality toward a competitive advantage for MSMEs in *Cisaat* village, Subang Regency, West Java. From the digital marketing being developed, it is hoped that it can increase promotions and public interest in shopping for MSME products from *Cisaat* village so that sales can also increase.

Based on Do et al. (2020), interaction via mobile applications using augmented reality positively influences the user's perceived ease of use, enjoyment, and satisfaction. Besides that, AR is often combined with other media to expose, articulate or demonstrate benefits for consumers to achieve company goals (Rauschnabel et al., 2019). This means that by utilizing the full capabilities of modern mobile devices to carry out marketing, e-commerce, and advertising tasks, capacity can be increased (Dwivedi et al., 2020).

AR provides many marketing opportunities that enable destinations to come alive amidst Covid-19 and gives visitors a better understanding of products and tourism as a tool to help them make choices. Moreover, AR can be combined to improve MSMEs in the tourism sector in Indonesia. The challenges and opportunities of industry 4.0 encourage innovation and creation from all levels of society in order to survive in the era of globalization (Nordman & Tolstoy, 2011). Therefore, digital marketing is something that is often used by entrepreneurs to introduce their products amidst technological advances. Several academics consider that digital marketing is the use of digital platforms and technology to market goods and services. Key (2017) shows that most digital marketing uses the internet and web-based technology. Seo et al. (2014) suggests that product simulations use AR. However, his research has not found results from simulations that can improve product engineering designs.

Besides that, Moeuf et al. (2018) explained that collaborative robots and big data will be the future of business transformation. However, MSMEs generally lack this expertise and take advantage of existing technological trends. Meanwhile, using mobile applications developed through technology in digital marketing has a positive emotional impact on consumers (Tarute et al., 2017). Dieck and Jung (2018) consider that AR can improve the user experience. This is because AR is easy to use. Eze et al. (2019) also shows that the use of mobile technology can help MSMEs improve their product and service sales promotion strategies. Thus, the novelty of this research lies in the development of AR, which was carried out to increase tourism potential through digital marketing for MSMEs

in *Cisaat* village. Therefore, the AR being developed focuses on economic aspects and tourism, which can increase profits for MSMEs.

METHODS

This research uses the development of Borg and Gall (2003). In the development process, researchers used Borg & Gall's (2003) systematics to design products that have suitability standards. There are ten steps in implementing the Borg and Gall (2003) model as follows:

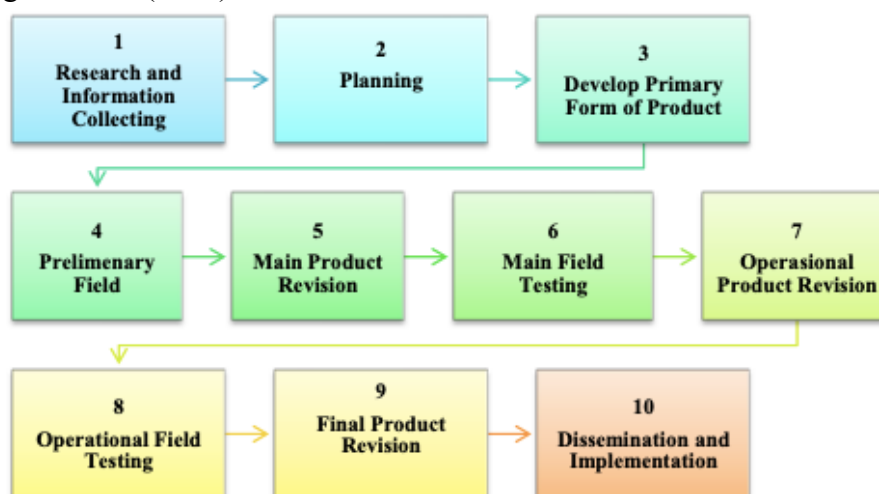


Figure 1. Borg & Gall procedure (Source: Borg and Gall, 2003)

This research collaborated with 50 MSME owners in *Cisaat* village consisting of businesses in the culinary sector there are 25 (50%), fashion 20 (40%), and agribusiness 5 (10%). Based on age level, 40% of them are aged 37 years to 41 years and over 41 years. However, there is also a younger generation involved in the MSME sector, namely 10% aged 25 to 30 years. Likewise, with the length of time the business has been running. 30% of the duration of MSME businesses in *Cisaat* village is less than 5 years and 5 to 10 years. In the feasibility test, researchers conducted user trials by developing Computer Usability Satisfaction Questionnaires (CSUQ): Psychometric Evaluation and Instructions for Use, namely operability, learnability, understandability and attractiveness (Lewis & Sauro, 2009). The Likert scale used is 1-5 with alternative answers: Strongly Disagree - Strongly Agree. Researchers also collected data through in-depth interviews as a form of product testing.

Data collection was carried out using in-depth interviews and distributing questionnaires. Before conducting interviews, researchers conducted outreach to 50 MSME activists by introducing mobile augmented reality. After that, researchers gave 50 MSME activists the opportunity to use the application for three weeks. Next, researchers sent a Google Form link to users to fill out a questionnaire for three weeks. Interviews were conducted after the questionnaire filling process. Interview activities were carried out for two weeks with 10 MSME activists. The interview location is adjusted to the respondent. The interview process was carried out for 65 minutes for each respondent. The tool used by researchers is a tape recorder to record the interview process. The data analysis techniques used in this research are quantitative (analyzing user feasibility test results with percentages) and qualitative (assessing user convenience of the product).

RESULTS & DISCUSSION

Cisaat village is one of the villages in the south of Subang Regency, which borders West Bandung Regency, Sumedang Regency, and Purwakarta Regency. With a height of 700 meters above sea level. *Cisaat* village has an area of 699.57 Ha, consisting of 4 hamlets with 6 community units and 28 neighborhood units. *Cisaat* village has administrative boundaries to the north with *Curugrendeng* village, east with *Palasari* village, south with *Ciater* village, west with *Cicadas* village. The natural scenery in *Cisaat* village is very natural and beautiful and has traditional culture and art that characterizes the village. The village has agro-tourism in the form of strawberry and pineapple gardens which customers can pick directly from the trees. Apart from that, there was also Zidane Village which was inaugurated in July 2007 by football player Zinedine Zidane who comes from France. Zidane Village in *Cisaat* was used as a pilot project for the French company Groupe Danone which produces processed milk into food and drinks. Zidane Village is one of the central areas for pure milk and is a village that excels in the field of animal husbandry.

The southern region of Subang Regency is one of the tourism zones in Subang Regency, so *Cisaat* Village is in a well-known tourist attraction area, for example the Sari Ater hot springs, Castelo and many more. *Cisaat* Educational Tourism Village is a tourist village that develops educational and cultural tourism based on local wisdom. With the main aim of getting a direct learning experience related to the activities visited, it is packaged by combining elements of tourism activities with educational content in it. *Cisaat* Village has a variety of cultural, artificial and natural tourism. Based on the large number of agrotourism mentioned above, it will also have an impact on the opinion of the people of *Cisaat* Village through MSME businesses. *Cisaat* Village Community. These results are also in accordance with data from the Department of Cooperatives and Small Businesses of West Java Province, especially in the Subang Regency area, the number of MSMEs increases every year from 2016 - 2021, as follows.

ID	kode_provinsi	nama_provinsi	kode_kabupaten_kota	nama_kabupaten_kota	Jumlah_Lembar	satuan	tahun
13	32	JAWA BARAT	3213	KABUPATEN SUBANG	169778	UNIT	2016
40	32	JAWA BARAT	3213	KABUPATEN SUBANG	180283	UNIT	2017
67	32	JAWA BARAT	3213	KABUPATEN SUBANG	191437	UNIT	2018
94	32	JAWA BARAT	3213	KABUPATEN SUBANG	203282	UNIT	2019
121	32	JAWA BARAT	3213	KABUPATEN SUBANG	215859	UNIT	2020
148	32	JAWA BARAT	3213	KABUPATEN SUBANG	229215	UNIT	2021

Figure 2. Subang Regency MSME data from 2016-2021 (Source: [opendatajabar](https://opendatajabar.com))

Based on the data above, Subang Regency MSME data from 2016 to 2021 experienced an increase in the number of units. From Subang Regency MSME data in 2016 there were 169,778 units, in 2017 there were 180,283, in 2018 there were 191,437, in 2019 there were 203,282, in 2020 there were 215,859, in 2021 there were 229,215. With a lot of agrotourism and natural resources available, the community can use it as village income and increase MSMEs for *Cisaat* Village. The number of MSMEs in Subang Regency

increases every year. From the district scale description, Cisaat village also experienced an increase in units each year. Apart from the increase in the number of MSME units every year. On the other hand, the increasing number of MSMEs is that the situation of MSMEs in Cicurrent Village is not yet supported by technology as a source of marketing (Digital Marketing). Marketing that is in line with the era of digitalization is by having marketing tools through digital marketing because the majority of people currently use devices to obtain a lot of information. The large number of tourist attractions available is already a good opportunity, but it also needs to be supported by technology so that it is easily known to the general public quickly.

Cisaat village is a village with abundant natural and human resources that can be utilized by creating MSMEs. Based on the business conditions of Cisaat Village, Subang Regency, the number of MSMEs increases every year. Apart from that, MSME activists in the village also experienced problems in marketing after the Covid-19 pandemic, because during the pandemic MSMEs in Cisaat Village experienced a decline in terms of income, purchases and tourist visits. To overcome and find answers to existing problems, we conducted a survey and needs analysis with the research object being MSME activists in Cisaat Village using a needs analysis sheet. The following are the results obtained.

Table 1. Need Analysis of AR product for MSME

Indicators	Yes	No
Have you experienced a decline in opinion during and after the Covid-19 pandemic era?	88,5%	11,5%
Have you experienced a decline in buyers during and after the Covid-19 pandemic?	91,7%	8,3%
Did you reduce your workforce during and after the Covid-19 pandemic?	44,8%	55,2%
Is there public transportation to Cisaat village?	72,8%	27,2%
Is access to Cisaat village difficult?	19,8%	80,2%
Is there an internet signal available in Cisaat Village?	82,6%	17,4%
Do you have a device or smartphone?	90,1%	9,9%
Do you have the data to access the internet?	87,2%	12,8%
Do you have the data to access the internet?	87,2%	12,8%
Have you ever promoted your MSME business?	56,5%	43,5%
Have MSME businesses ever been promoted via social media?	39,7%	60,3%

Survey to analyze the needs of MSME activists in Cisaat village with as many as 50 MSME activists in the village. 50 objects filled out the proposed questionnaire. Based on the results obtained for the question, 88.5% of MSME activists experienced a decline in opinion during and after the Covid-19 pandemic era and 11.5% did not experience a decline in opinion during and after the Covid-19 pandemic era. 91.7% of MSME activists experienced a decrease in buyers during and after the Covid-19 pandemic era and 8.3% did not experience a decrease in buyers during and after the Covid-19 pandemic era.

As many as 44.8% of MSMEs reduced workers during and after the Covid-19 pandemic era and as many as 55.2% reduced workers during and after the Covid-19 pandemic era. As many as 72.8% of correspondents answered that there was public transportation to Cisaat village and 27.2% of public transportation to Cisaat village was inadequate. As many as 19.8% of access to Cisaat village is difficult and 80.2% of access to Cisaat village is easy to find and reach. As many as 82.6% of internet signals were available in Cisaat Village and 17.4% answered that internet signals were only achieved and stable on certain providers. As many as 90.1% of respondents have a device or smartphone and 9.9% only have a device that is not a smartphone. As many as 87.2% have

data to access the internet and 12.8% have smartphones but only rely on the WiFi network. As many as 56.5% promoted MSME businesses and 43.5% had never promoted MSMEs. As many as 39.7% had ever been promoted via social media and 60.3% had never promoted MSMEs via social media.

Based on the results of the needs analysis, researchers carried out planning by formulating research objectives, namely developing AR as digital marketing for MSMEs in Cisaat village. Next, researchers carried out design development and limited product testing. After carrying out a series of steps, the researcher then began the feasibility test. This feasibility test was carried out by involving 50 potential users. This user is an MSME activist in Cisaat village who previously filled out the questionnaire that was submitted. The following are the design results of augmented reality products as a digital marketing innovation.



Figure 3. Augmented Reality product

Researchers developed mobile-based AR by highlighting tourism potential in which there are various barcodes and MSME catalogues. So, potential buyers can identify the products offered by MSMEs. Apart from that, there are also various tourism destinations in Cisaat village.

Table 2. Product Feasibility Trial Results

Aspects	Percentage	Category
Operability	78.8%	Feasible
Learnability	81%	Highly Feasible
Understandability	76.7%	Feasible
Attractiveness	77.8%	Feasible
Average	78.7%	Feasible

Table 2 shows that mobile-based AR is suitable for use as digital marketing for MSMEs. The application is quite interesting, but the size of the text in the application needs to be adjusted so that it is easy to read for elderly users (MSME 1 interview results, June 2023). Images and photos in the application should be adjusted. Because there are some photos that haven't been updated. Then, also provide a way so that we can update our product photos (MSME 2 interview results, June 2023). This application helps us in carrying out promotions for customers. It is hoped that this application can also be downloaded either via Playstore or App Store. So that customers can choose and read the

products they want to buy (MSME 3 interview results, June 2023). This is in line with the results of the needs analysis in previous research, namely 56.5% had promoted MSME businesses and 43.5% had never promoted MSMEs. As many as 39.7% had ever been promoted via social media and 60.3% had never promoted MSMEs via social media. This condition makes them interested in using mobile augmented reality as a digital promotional strategy. Apart from that, researchers also conducted in-depth interviews with ten respondents. The first question is how do you feel when using mobile augmented reality?

“At first I had difficulty using the application. But I tried to study it for two days. It turns out the application is easy to learn. Even though the internet signal is an obstacle in opening the application. After that, I tried to give directions to my employees and it turned out they quickly understood.” (MSME 4, Interview Results 2023)

“Actually, this application is interesting to use. Apart from that, it helps us MSMEs in promoting products. Maybe you need to add updated photos and adjust the appearance and color.” (MSME 5, Interview Results 2023)

“With this application, I as an MSME owner feel helped. Moreover, my customers can also choose products and then contact our sales directly. This makes the transaction process easier.” (MSME 6, Interview Results 2023)

The interview results show that respondents are interested and understand mobile augmented reality easily. They also educate employees and introduce the application to several of their customers. In other words, mobile augmented reality is easy to understand, easy to learn, easy to operate and interesting for users.

Discussion

Based on the results of research conducted, it shows that the mobile-based AR application developed not only supports the same interactive functions as websites but also location-based services, feedback and information search. Thus, this research supports the results of Sudjatmoko's study et al. (2023) that marketing innovation affects the performance of MSMEs. This is because this mobile-based AR product can facilitate its users with easy access to information anywhere and at any time. As a result, they have enormous potential not only in digital marketing but also in helping tourists find tourist destinations (Griffith & Alpert, 2022). The research findings also show that this mobile-based AR product is an alternative for MSMEs to be able to face the post-COVID-19 pandemic that has passed. So, this research is in line with Halik and Medyńska-Gulij (2017) which shows that AR also has the ability to offer customized content and services to all users including introducing potential buyers to the MSME industry in the tourism sector. Although this research is different from Dieck and Jung (2018) in terms of using AR, but with AR, users can have their own experience in searching for tourist destinations and the various information they need. This illustrates that AR has a function that is based on previous requests and displays appropriate content when tourists visit sites at a destination or shop (Situmorang et al., 2019).

On the other hand, this research also offers innovation in digital marketing that is in line with Yaoyuneyong et al. (2014) where technological advances, advertising and product promotion models have shifted to become technology-based. So, this promotional process is not only limited to advertising on television or radio but has spread to social media and other streaming media. Therefore, digital marketing is a marketing activity that is currently continuing to develop to reach target consumers. Moreover, this research seeks to collaborate on the tourism potential of tourist villages with various MSMEs available in the village. This is what makes mobile-based AR products accepted by users because through these products, MSMEs can carry out promotions through applications specifically

created for their shops. In addition, this study supports research implications Zahara et al (2023) where MSMEs must continue to improve their capabilities and sharpen the implementation of marketing strategies. This capability increase is carried out by integrating photos into the application to make it easier for customers to choose products. Apart from that, this research also shows that the development of mobile augmented reality provides benefits to the economic components where it exists, utility, and user experience.

CONCLUSION

This research concludes that mobile-based AR products are feasible for use by MSMEs. Apart from that, using AR as digital marketing makes it easy for users to get to know the products offered by MSMEs. Apart from that, this research also provides an opportunity for tourist villages to increase tourism potential by using digital marketing such as mobile-based AR. Thus, AR as a digital marketing innovation can provide opportunities for MSMEs to expand their consumer network in marketing their products and increase their superiority. This research has limitations on dissemination and implementation of the final model. Future research is expected to be able to develop this mobile-based AR product by using other additional models. Apart from that, conducting product trials in other tourist villages with a larger number of MSMEs. This research has implications for tourist villages in promoting their tourism potential starting from tourist destinations to MSMEs. Apart from that, the presence of MSMEs can also encourage the potential of culinary tourism in tourist villages so that they can develop further following technological developments.

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