The Effectiveness of a Virtual Reality Marketing Video on the People Desire to Buy a Product

Sigit Wijayanto a,*, Jouvan Chandra Pratama Putra a

*a Faculty of Engineering and Computer Science, Universitas Bakrie, Jakarta, Indonesia
Corresponding author: *sigit.wijayanto@bakrie.ac.id

Abstract—Virtual Reality technology can provide new experiences and different points of view of activities, events, or products for the users. In line with advances from VR technology, YouTube initiates to support the spread of VR videos by creating a VR feature on their platform. A hundred videos about a dangerous activity, Horror activity, and Marketing video of software or a movie product are found on the YouTube platform. Meanwhile, it is still not yet known how the effectiveness of an advertisement using VR video via the YouTube platform on the people desires to buy a product, especially in Indonesia, which then became the purpose of this study. In carrying out this study, a quantitative study was used by creating a digital questionnaire and distributed it with Google Forms. Then the data obtained will be processed by the respondent demographics and the 4 types of analysis, such as the Validity analysis, the Reliability analysis, the Ranking of VR applications on product promotions, and the Correlation analysis. Afterward, the study found that the B1 and B2 variables refer to Advertising, making it easy for us to understand the product has the most correlation coefficient. Moreover, 80% of the respondents stated that they like the VR advertisement product. It means that people are interested in trying and feel something new in the way VR technology is given to them. Ultimately, the respondents agree that VR advertising has informed them well about the product.

Keywords—YouTubeVR; virtual reality; marketing.

I. INTRODUCTION

Along with technological developments that have occurred very rapidly in recent years, many changes have occurred in the marketing world. Marketing initially used leaflets, newspapers, television, until nowadays they are using digital marketing and social media. The last term, social media, is currently being carried out very intensively by various manufacturers. Moreover, using social media is considered cheaper and more effective compared to other marketing methods [1], [2]. Besides, digital marketing and social media marketing has a high percentage of effectiveness, especially when we use ads on social media [3]. This is also proven by a survey conducted by adobomagazines in 2016 [4], where social media ads ranks at the top in terms of the effectiveness of digital marketing of a product (see Figure 1).

Apart from the high level of effectiveness, users will also get a different experience from marketing through social media, because it brings the advertisement directly to the users’ hand. The social media platform continues to improve in order to support and get the technology to a higher level along with the rapid technological developments.

On the other hand, the virtual reality (VR) technology, which is a real-world virtualization technology into a synthetic world, that is limited by regulations such as government regulations, time and gravity [5], [6], [7] or in other definition, a technology that makes it possible to simulate a real environment in which the user can experience the feeling of being present [8], [9], has grown very rapidly. This is based on forecasting data from Superdata Research in 2020, the sales from the VR technology was 21 times higher than in 2016 (from US$2.9 billion to US$ 61.3 billion) [10]. The VR technology This technology also has attracted the marketers based on the novelty, uncertainty, complexity and its potential conflict it presents for marketing [11], [12], [13], [14], [15]. The Marketers want to utilize this technology in their marketing strategy for their products, such as software application products and movie products, to create a new user experience for their customer target [16]. Simultaneously, YouTube, a social media platform for online video streaming providers, has offered a VR video feature on their platform [17]. This feature would be activated by clicking on the
cardboard icon, which available only on VR videos. Then, the video will be displayed to the VR videos and can be seen by using VR glasses, which is very cheap and easy to find nowadays [18].

![Digital Marketing Channel Effectiveness, 2016](image)

From the marketing videos that have been carried out with VR technology on the YouTube platform, it is considered to have been able to provide a new user experience for the YouTube viewers. Studies have proven this understanding using text mining on the use of VR in marketing [19]. Besides, user experience is one of the key factors in selling a product. When a product can present a new or better user experience than the previous one, it will have a good impact on sales of the product. This is considered a revolutionary approach that will connect the sensation of using a product with a new level of satisfaction from the customer or even the prospect of the product [20], [21], [22].

Furthermore, in this study, the Demographic of the respondents, the Validity analysis, the Reliability analysis, the ranking of VR applications on product promotions, and the Correlation analysis will be calculated to reach its purpose to analyze the effectiveness of a VR video on the people desire to use and buy a product that advertised using VR technology.

II. MATERIAL AND METHOD

This research was accomplished through literature research, and many parameters related to VR and its advantages were drawn and tested in this stage. Data collection was conducted through personal questionnaire surveys [23], [24]. Many experienced interviewees were selected from the millennial generation. Respondents were asked to rank the significance level of factors affecting their preference regarding VR applications. A five-point likert-scale of 1 to 5 was adopted to assess the degree of significance of each cause where 1=ED= extremely disagree, 2=D= disagree, 3=N= neutral, 4=A= agree, 5=EA= extremely agree. Here are the questions in the survey that include the five-point Likert-scale as shown in Table I. These questions were based on the Study from Setiawan [25].

### Table I

| No | Questions                                                                 | ED | D  | N  | A  | EA |
|----|---------------------------------------------------------------------------|----|----|----|----|----|
| 1  | The advertisement can be viewed with or without Virtual Reality (VR) devices |    |    |    |    |    |
| 2  | Advertising makes it easy for us to understand the product                |    |    |    |    |    |
| 3  | The product visualization is attractive                                   |    |    |    |    |    |
| 4  | The advertisement is not boring                                           |    |    |    |    |    |
| 5  | The advertisement is very interesting                                     |    |    |    |    |    |
| 6  | The advertisement give users a different view of a product               |    |    |    |    |    |
| 7  | The advertisement increases the desire to use the product                 |    |    |    |    |    |
| 8  | This advertisement can be seen and enjoyed by various groups             |    |    |    |    |    |
| 9  | Users watch this advertisement more than 1 time                           |    |    |    |    |    |
| 10 | The advertisement is able to provide the required information about the product |    |    |    |    |    |
| 11 | The advertisement is able to produce information on a product that can be clearly understood |    |    |    |    |    |
| 12 | You will use the advertised product after watching this advertisement     |    |    |    |    |    |

Moreover, 2 YouTube VR videos were used in this survey, namely “Google Tilt Brush” and “The Conjuring 2; Experience Enfield VR 360” [26], [27], [28]. The result will then be categorized by alphabetically sort, which number 1 will be represented by A, number 2 will be represented by B and so on. Later on, the Google Tilt Brush advertisement will be represented by number 1 and The Conjuring 2; Experience Enfield will be represented by number 2. Then the questions table will be explained in Table II;

### Table II

| No | Questions                                                                 | ED | D  | N  | A  | EA |
|----|---------------------------------------------------------------------------|----|----|----|----|----|
| A1 | The advertisement can be viewed with or without Virtual Reality (VR) devices |    |    |    |    |    |
| A2 | The advertisement can be viewed with or without Virtual Reality (VR) devices |    |    |    |    |    |
| B1 | Advertising makes it easy for us to understand the product                |    |    |    |    |    |
| B2 | Advertising makes it easy for us to understand the product                |    |    |    |    |    |
| C1 | The product visualization is attractive                                   |    |    |    |    |    |
| C2 | The product visualization is attractive                                   |    |    |    |    |    |
| D1 | The advertisement is not boring                                           |    |    |    |    |    |
| D2 | The advertisement is not boring                                           |    |    |    |    |    |
| E1 | The advertisement is very interesting                                     |    |    |    |    |    |
| E2 | The advertisement is very interesting                                     |    |    |    |    |    |
| F1 | The advertisement give users a different view of a product               |    |    |    |    |    |
| F2 | The advertisement give users a different view of a product               |    |    |    |    |    |
| G1 | The advertisement increases the desire to use the product                 |    |    |    |    |    |
| G2 | The advertisement increases the desire to use the product                 |    |    |    |    |    |
| H1 | This advertisement can be seen and enjoyed by various groups             |    |    |    |    |    |
| H2 | This advertisement can be seen and enjoyed by various groups             |    |    |    |    |    |
The data from the questionnaire is as follows:

### TABLE III
**Q U E S T I O N  L I S T  N U M B E R I N G, I D E N T I F I C AT I O N  A N D  T H E  R E S U L T**

| No | Questions | ED | D | N | A | EA |
|----|-----------|----|---|---|---|---|
| A1 | The advertisement can be viewed with or without Virtual Reality (VR) devices | 4 | 3 | 9 | 25 | 15 |
| A2 | The advertisement can be viewed with or without Virtual Reality (VR) devices | 1 | 2 | 11 | 25 | 17 |
| B1 | Advertising makes it easy for us to understand the product | 0 | 0 | 5 | 30 | 21 |
| B2 | Advertising makes it easy for us to understand the product | 0 | 3 | 8 | 25 | 20 |
| C1 | The product visualization is attractive | 1 | 1 | 5 | 20 | 29 |
| C2 | The product visualization is attractive | 0 | 3 | 13 | 19 | 22 |
| D1 | The advertisement is not boring | 0 | 1 | 10 | 22 | 24 |
| D2 | The advertisement is not boring | 0 | 3 | 13 | 20 | 20 |
| E1 | The advertisement is very interesting | 0 | 1 | 8 | 25 | 22 |
| E2 | The advertisement is very interesting | 0 | 5 | 16 | 12 | 26 |
| F1 | The advertisement give users a different view of a product | 0 | 1 | 7 | 29 | 19 |
| F2 | The advertisement give users a different view of a product | 0 | 2 | 10 | 25 | 19 |
| G1 | The advertisement increases the desire to use the product | 0 | 3 | 9 | 20 | 24 |
| G2 | The advertisement increases the desire to use the product | 0 | 5 | 18 | 17 | 16 |
| H1 | This advertisement can be seen and enjoyed by various groups | 1 | 2 | 10 | 27 | 16 |
| H2 | This advertisement can be seen and enjoyed by various groups | 2 | 10 | 23 | 16 | 5 |
| I1 | Users watch this advertisement more than 1 time | 0 | 5 | 16 | 24 | 11 |
| I2 | Users watch this advertisement more than 1 time | 0 | 4 | 24 | 20 | 8 |
| J1 | The advertisement is able to provide the required information about the product | 0 | 1 | 7 | 33 | 15 |
| J2 | The advertisement is able to provide the required information about the product | 0 | 1 | 15 | 28 | 12 |
| K1 | The advertisement is able to produce information on a product that can be clearly understood | 0 | 0 | 8 | 35 | 13 |
| K2 | The advertisement is able to produce information on a product that can be clearly understood | 0 | 1 | 14 | 33 | 8 |
| L1 | You will use the advertised product after watching this advertisement | 0 | 4 | 27 | 13 | 12 |
| L2 | You will use the advertised product after watching this advertisement | 0 | 4 | 30 | 13 | 9 |

Later on, the data was analyzed using R 3.5, and the survey results are introduced and discussed in the following subsections.
A. Demographics of Respondents

Out of 56 respondents performed in this survey, 35 are males, and 21 are females. For assessing the preference of respondents, a number of questionnaires related to attracting or inviting customers to buy the products due to the application of VR were asked. The survey found that the domicile of respondents varied widely and presented as in Figure 2.

B. Validity

In preliminary research, it is necessary to conduct validity tests to assess whether the research purpose's instruments are suitable. This can be achieved by using the following Pearson correlation equation [30]:

\[ r_{xy} = \frac{m_{XY} - (\bar{X})Y}{\sqrt{(n\bar{X}^2 - \bar{X})^2}(n\bar{Y}^2 - \bar{Y})^2}} \]  

Equation 2, Validity [30].

Where;
- \( r_{xy} \): Correlation coefficient
- \( n \): The number of respondents
- \( X \): Score of each item of the questionnaire
- \( Y \): Score of all items of the questionnaire

Once the calculation of the Pearson correlation is completed, the \( t \) value is then calculated. It can be achieved by the following formula [31]:

\[ t_{\text{calc}} = \frac{r_{xy} \sqrt{n-2}}{\sqrt{n-1-r_{xy}^2}} \]  

Equation 3, Pearson Correlation [31].

Besides, the value of \( t_{\text{calc}} \) is compared with the \( t \) table to determine which question in the questionnaire list is invalid or valid. The results are listed in Table IV.

C. Reliability

Conduct reliability assessments to find the stability and consistency of the data [30]. This is achieved by using the commonly used Cronbach alpha. When the value of Cronbach's \( \alpha \) is less than 0.3, the reliability of the data is considered to be at a low level. This means that the data is unreliable and unacceptable. Subsequently, when the value of Cronbach's \( \alpha \) is greater than 0.7, the reliability of the data will be recognized at a higher level [31]. The calculation and list of Cronbach's \( \alpha \) values are shown in Table V.

D. Ranking of VR applications on product promotions

A hierarchical evaluation of factors is carried out from the collected data to determine the factors considered in the study of the effectiveness of a VR marketing video. This is done by using the average index (AI). The results are shown in Table VI.

If the value of \( t_{\text{calc}} \) is less than the value of the \( t \) table, an indication of invalidity is identified. According to Table IV, 7 questions were found to be invalid and 17 questions were valid.
The table shows that the B1 with an AI value of 4.28 is the most important factor affecting the VR applications. In addition, in terms of D1, E1, F1, and G1 are also considered extremely important factors with their AI value of 4.232; 4.214; 4.178, and 4.160 consecutively.

E. Correlation Analysis

In the questionnaire survey, the respondents were asked to rate based on a 5-points Likert scale whether the video content, the information present and the virtual reality technology involved in the video impact the people's desire to buy a product. The result of this assessment is presented in Table VII.

| No | Variables Involved | Correlation Coefficient | Sig. (2-tailed) | Significant |
|----|--------------------|-------------------------|----------------|-------------|
| 1  | B1 and B2          | 0.605                   | 0.000          | Y           |
| 2  | D1 and D2          | 0.469                   | 0.000          | Y           |
| 3  | E1 and E2          | 0.365                   | 0.000          | Y           |
| 4  | F1 and F2          | 0.487                   | 0.000          | Y           |
| 5  | G1 and G2          | 0.368                   | 0.0025         | Y           |
| 6  | J1 and J2          | 0.552                   | 0.000          | Y           |
| 7  | K1 and K2          | 0.430                   | 0.0005         | Y           |
| 8  | L1 and L2          | 0.438                   | 0.0005         | Y           |

Table VII shows that the values obtained for significant variables are in the range of 0.368 to 0.605. The greatest correlation was presented from variables B1 with B2 and J1 with J2, namely the advertising capacity to make it easier for customers to get information about these products and understand them easily.

IV. CONCLUSION

In this paper, it has been shown that the innovation of VR is carried out by using a quantitative approach. The survey has been spread out using google forms digital questionnaires to understand them easily.

Furthermore, the top five rank of VR parameters have been calculated and presented in Fig. 3, in which B1 as the number one factor consider on the VR application on product promotions. Later on, the correlation analysis was done at last. Based on this analysis, we obtained significant variables are in the range of 0.368 to 0.605, with the greatest correlation was presented from variables B1 with B2 and J1 with J2. After conducting the survey and the 4 analyses, it can be concluded that the use of VR technology in marketing will have a very good impact on product sales based on the public or market target desire to buy the product. Where the target market will have a new user experience, even before they have the product. This is because the product can be used by the user individually and it is available at any time, as long as the user has the VR devices such as VR glasses and can access the VR marketing videos. This is proven by the answers from number J1, J2, K1 and K2, where most respondents agree to the statement that the VR marketing videos provide clear information and knowledge that needed by the target market, therefore the VR marketing videos influence them for buying the product.

Then 13 respondents answered agree that they preferred to use the 2 products offered after watching the VR marketing videos. Furthermore, there are about 12 people who wanted to use product 1 and there are 9 people who wanted to use product 2 after watching the 2 research objects. Exploring this theme will need further research that should focus on user experience, virtual reality technology, and which content types will positively impact product marketing.

ACKNOWLEDGMENT

We are grateful to the respondents for the non-technical supports during the survey regarding this study.

REFERENCES

[1] A.K. Kiritis, and F. Karahan. "To Be or Not to Be in Social Media Arena as the Most CostEfficient Marketing Strategy after the Global Recession". Procedia Social and Behavioral Sciences 24, 2011. 260–268.
N. Poddar and D. Agarwal. "A comparative study of application
effectiveness between digital and social media marketing for
sustainability of start-ups." International Journal of Business Insights & Transformation. Apr-Sep 2019, Vol. 12 Issue 2, p50-54, 5p.

M. Alcañiz, E. Bigné, J. Guixeres, "Virtual Reality in Marketing: A
Framework, Review, and Research Agenda". Frontiers in Psychology, 2018. https://doi.org/10.3389/fpsyg.2018.00981.

R. R. Burke, "Virtual Reality for Marketing Research." In: Moutinho, L., Sokele M. (eds) Innovative Research Methodologies in
Tourism Marketing, Springer, 2018. https://doi.org/10.1007/978-3-319-64400-4_3.

T. Griffin, J. Giberson, S.H. Lee, D. Gutten-tag, M. Kandaurova, K.
Sergueeva, F. Dimanche, "Virtual Reality and Implications for
Destination Marketing". Travel and Tourism Research Association:
Advancing Tourism Research Globally, 2018. https://doi.org/10.1007/978-3-319-64400-4_3.

R. R. Burke, “Virtual Reality for Marketing Research.” In: Moutinho
L., Sokele M. (eds) Innovative Research Methodologies in
Management. Palgrave Macmillan, Cham, 2018. https://doi.org/10.1007/978-3-319-64400-4_3.

M. Rach, R. Scott The Use of Virtual Reality in Marketing: Exploring
the Need for Technology and Language Adaptation to Create High
Quality Immersive Experiences. In: Rocha A., Reis J., Peter M.,
Bogdanović Z. (eds) Marketing and Smart Technologies. Smart
Innovation, Systems and Technologies, vol 167. Springer, Singapore, 2020. https://doi.org/10.1007/978-981-15-1564-4_8.

C. Snelson, YC. Hsu, Educational 360-Degree Videos in Virtual
Reality: a Scoping Review of the Emerging Research. TechTrends 64,
404–412 (2020). https://doi.org/10.1007/s11528-019-00474-3.

Google, "Watch VR180 and 360-degree videos with Cardboard -
YouTube Help", Support.google.com, 2020. Available:
https://support.google.com/youtube/answer/6239930?hl=en&ndkref_topic=9259098&dark=0. [Accessed: 03- Dec- 2020].

S.M.C. Loureiro, J. Guerreiro, S. Eloy, D. Langaro, P. Panchapakesan,
"Understanding the use of Virtual Reality in Marketing: A text mining-
based review," Journal of Business Research, Elsevier, vol. 100 (C),
pages 514-530, 2018.

C. Flavián, S. Ibáñez-Sánchez, C. Orús. "The impact of virtual,
Augmented and mixed reality technologies on the customer experience".
Journal of Business Research (2018) https://doi.org/10.1016/j.jbusres.2018.10.050.

R. N. Bolton, J. R. McColl-Kennedy, L. Cheung, A. Gallan, C. Ors
hnger, L. Witell, M. Zaki, "Customer experience challenges:
bringing together digital, physical and social realms", Journal of
Service Management, 2018. https://doi.org/10.1108/JOSM-04-2018-
0113.

D. Setiawan, “Virtual Reality dalam pemasaran perumahan PT.Hadir
Realindo Utama Jambi *”, 2018.

Google Tiltbrush, tiltbrush.com and google youtube channel.
Retrieved from https://www.youtube.com/watch?v=TeqkNdrdbpk
[Accessed: 03- Dec- 2020].

Warner Bros Pictures, The Conjuring 2; Experience Enfield VR 360.
Retrieved from https://www.youtube.com/watch?v=A6aRkhlqWuE
[Accessed: 03- Dec- 2020].

M. Lee, S.A. Lee, M. Jeong, H. Oh, “Quality of virtual reality and its
impacts on behavioral intention.” International Journal of Hospitality
Management 90, 2020. 102595.

M. Lee, S.A. Lee, M. Jeong, H. Oh, “Quality of virtual reality and its
impacts on behavioral intention.” International Journal of Hospitality
Management 90, 2020. 102595.

M. Rach, R. Scott The Use of Virtual Reality in Marketing: Exploring
the Need for Technology and Language Adaptation to Create High
Quality Immersive Experiences. In: Rocha A., Reis J., Peter M.,
Bogdanović Z. (eds) Marketing and Smart Technologies. Smart
Innovation, Systems and Technologies, vol 167. Springer, Singapore, 2020. https://doi.org/10.1007/978-981-15-1564-4_8.

C. Snelson, YC. Hsu, Educational 360-Degree Videos in Virtual
Reality: a Scoping Review of the Emerging Research. TechTrends 64,
404–412 (2020). https://doi.org/10.1007/s11528-019-00474-3.

Google, "Watch VR180 and 360-degree videos with Cardboard -
YouTube Help", Support.google.com, 2020. Available:
https://support.google.com/youtube/answer/6239930?hl=en&ndkref_topic=9259098&dark=0. [Accessed: 03- Dec- 2020].

S.M.C. Loureiro, J. Guerreiro, S. Eloy, D. Langaro, P. Panchapakesan,
"Understanding the use of Virtual Reality in Marketing: A text mining-
based review," Journal of Business Research, Elsevier, vol. 100 (C),
pages 514-530, 2018.

C. Flavián, S. Ibáñez-Sánchez, C. Orús. "The impact of virtual,
Augmented and mixed reality technologies on the customer experience".
Journal of Business Research (2018) https://doi.org/10.1016/j.jbusres.2018.10.050.

R. N. Bolton, J. R. McColl-Kennedy, L. Cheung, A. Gallan, C. Ors
hnger, L. Witell, M. Zaki, "Customer experience challenges:
bringing together digital, physical and social realms", Journal of
Service Management, 2018. https://doi.org/10.1108/JOSM-04-2018-
0113.

D. Setiawan, “Virtual Reality dalam pemasaran perumahan PT.Hadir
Realindo Utama Jambi *”, 2018.

Google Tiltbrush, tiltbrush.com and google youtube channel.
Retrieved from https://www.youtube.com/watch?v=TeqkNdrdbpk
[Accessed: 03- Dec- 2020].

Warner Bros Pictures, The Conjuring 2; Experience Enfield VR 360.
Retrieved from https://www.youtube.com/watch?v=A6aRkhlqWuE
[Accessed: 03- Dec- 2020].

M. Lee, S.A. Lee, M. Jeong, H. Oh, “Quality of virtual reality and its
impacts on behavioral intention.” International Journal of Hospitality
Management 90, 2020. 102595.

M. Lee, S.A. Lee, M. Jeong, H. Oh, “Quality of virtual reality and its
impacts on behavioral intention.” International Journal of Hospitality
Management 90, 2020. 102595.