

Research on the Design of VR Video in Advertising and the Problems It Faces

Yining Yang^{1,a,*}

¹*Faculty of Arts, Design and Media, Birmingham city university, Birmingham, United Kingdom
a. Yining.Yang@mail.bcu.ac.uk*

**corresponding author*

Abstract: At present the development of VR video in advertising has been changing, VR technology provides a lot of new creative and interactive ways for advertising. VR advertising is also a hotspot of current research, which has been applied in many fields, and it has a very good prospect for development in the future. Since there is less literature in the research direction of virtual reality advertising, the discussion and research on this aspect of the application of VR video in advertising is carried out. This paper discusses and analyses several aspects of VR advertisement product demonstration, brand narration and advertisement comparison, at the same time, through the comparison and analysis of VR advertisement and traditional advertisement to understand the advantages and disadvantages of VR video at present, and analyses the problems encountered in the four aspects of virtual reality video in terms of technology, cost, experience sense and limitations. Finally, this paper gives an outlook on the hot spots and development prospects of this research topic.

Keywords: VR video, advertising design, virtual reality advertising

1. Introduction

Most individuals believe that VR video is the same as 360 panoramic videos. There is, however, a distinction between the two. VR video is computer-generated and is built on a 360-degree panoramic video. This allows individuals to effortlessly observe the video scene, immerse themselves in the virtual scene, and interact with the virtual environment. Users can experience their favourite roles and explore a variety of different surroundings; with the choices they make determining the narrative direction of the VR video. The 360-degree video is made with panoramic or multiple cameras that can catch any direction and create a spherical vid. The mouse can be used to drag or click when playing back the video so user can see any angle in the video and interact with it [1].

With the development of science and technology, virtual reality function is gradually applied in various fields such as entertainment, tourism, medical care, education, and other fields, in the entertainment field of film production. In the medical field, diagnostic and therapeutic aspects and in the educational field, teaching practices have begun to use the functions of virtual reality to assist, especially in advertising, virtual reality tools are particularly popular with travel advertisers, because the immersive experience of virtual reality allows consumers to experience simulated travel environments, helping them to plan their trips and experience environmental scenarios of the places they want to visit without having to spend money. There are also now virtual games that allow users to experience scenes from films. There are a few instances of travel VR videos, such as the

collaboration between Qantas Airways and Samsung Electronics. Qantas Airways used the Gear VR headset in their first-class cabins on the route from Australia to Los Angeles. By utilizing the headset, they captured 360 and 3D videos, allowing the viewers to experience city tours and Hollywood scenes [2]. There are also examples of virtual games such as Second Life, which are Internet-based virtual worlds in which people can define their own interactions with others and can socialise and travel [3].

Nowadays, the technology of VR can be applied to the field and degree of gaming and entertainment advertising, many people have begun to use virtual reality technology to practice, and VR can also create a good sense of atmosphere, immersive user experience and interactivity in the user, VR in Advertising brings the advantage that it provides people with the experience of the scene in a safe situation task [4], but also can bring a sense of immersion, but VR also has limitations, such as the technology and the cost of equipment.

All in all, virtual reality technology offers great potential for aiding advertising design and publicity. It allows users to immerse themselves in a range of environments and gain insights into diverse cultures. Despite the advantages of the development of VR technology, there is not a lot of research literature in this area of VR video advertising, in order to fill the lack of literature on VR video advertising, therefore, through a small amount of literature and cases from the VR video advertising aspects of the user experience, brand storytelling and advertising comparisons are discussed. As well as the problems faced by VR video are analysed and studied.

2. VR Video Advertising Apps

2.1. Product Demonstration Case

2.1.1. Intuitive and Lively

In advertising applications, VR video is a computer-generated virtual reality environment for viewers to have an immersive experience, while 360 panoramic video is shot and recorded by a camera, and the video is stitched together by computer software to form a panoramic video. Nowadays, virtual reality technology is the most promising emerging technology, one of the most important features of VR advertising is vividness, mainly using virtual reality technology to display products or services to attract users' attention. There are some successful cases in virtual reality advertising, for example, Marriott Hotel through virtual reality technology to promote the honeymoon package offered by the London and Hawaii hotels, the user needs to experience through the Samsung Gear VR headset, it is the scene is mainly through the virtual video to bring the user to the hotel interior, through the Figure 1 users can see the front desk of the hotel, as well as hotel rooms, users can open the door to enter the room, select the type of room users need, control the room, and then enter the room. Select the type of room users need and control the lighting. It will also take customers directly into the tourism scenes in London and Hawaii, showing the virtual tourism advertising function, such as the Andes Mountains in intelligence, an ice cream shop in Rwanda and the snack street in Beijing, in which the virtual reality video scenes are based on the real tourists, it is the use of VR to combine the tourism products and the environment, and it can bring about the promotion of tourism advertising [5].



Figure 1: Marriott Hotel Front Desk and Room Virtual Scene [5].

2.1.2. Give Users an Immersive Experience

The second crucial aspect of VR advertising is immersion. A well-executed immersive experience has the potential to provide users with a positive advertising experience. For instance, CCTV released the Samsungdui Fantasy Journey virtual game, depicted in Figure 2, to reconstruct the Samsungdui Museum and the excavation site of cultural relics. In the game, users can visit a virtual museum to learn about the history of artefacts, watch artefacts being excavated on site, and travel to Shu during the Shang Dynasty to experience life in the contemporary Bronze Age. The historical scenes' storytelling, along with the sound effects and the explorer characters, is intended to foster interaction between users and the virtual environment, thus providing an immersive experience. The virtual environment primarily involves the use of images, text, and short videos to engage the audience, provide them with solutions to their queries, and stimulate their thoughts. These two instances emphasize two critical aspects of VR advertising: realism and immersion [6], which enable users to have a profound experience. However, it is worth noting that virtual reality has both benefits and drawbacks.



Figure 2: Scene at the Sanxingdui archaeological site [6].

Virtual reality allows virtual spaces to be presented in an immersive way, providing a more intuitive and vivid travel scenario of London and Hawaii. Virtual Reality allows users to interact with the virtual environment, in the case of the Marriott Hotel, customers can navigate through the virtual environment, enter rooms, view different room, and adjust the lighting. VR presentations also offer remote demonstration services, where the user does not need to be physically present at the hotel in order to virtually experience travel over the internet, in the example above the user does not need to travel to London and Hawaii, through the virtual reality demonstration they can experience the hotel and travel. Its drawback is the limited equipment, using VR equipment requires the purchase of an expensive VR headset, which prevents many users from easily experiencing VR product demonstrations, for example the Oculus Rift retails for around \$500 [2]. Secondly, the limitations of VR, due to the limitations of virtual reality technology, cannot perfectly simulate the real environment, in terms of graphics quality, resolution still needs to be improved. In addition, when using VR equipment to display, there may be users who experience discomfort and eye fatigue [4], which may limit customer engagement and experience. Therefore, although virtual reality technology has

advantages, but it is still in the development stage, not as popular as mobile phones, computers and other electronic products, there are still a lot of places and space for improvement.

2.2. Brand Storytelling

2.2.1. Make the Brand's Core Values Clear to Users

Virtual reality (VR) technology is increasingly entering the mass market, yet it remains in its early stages for sales advertising. Although the use of VR in brand adverts is becoming more prevalent, it is still a relatively new occurrence. One example of this is the IKEA Immersive Furniture Experience, which was withdrawn in 2016 [5]. Instead, the company has adopted immersive storytelling to show users the core values of the brand. As can be observed from Figure 3, IKEA's virtual advertisements correspond not only with their furniture but also offer dynamic features such as colour adjustments, lighting adaptation and ambience customization for different times of day. The option to view the simulated surroundings outside the residence, coupled with the audio recording of the actual environment, and the capability to transform the corresponding furnishings directly into a list of things to purchase, not only aids comprehension of the IKEA brand, but also facilitates clients in identifying the core principles of simplicity and convenience that IKEA embodies.

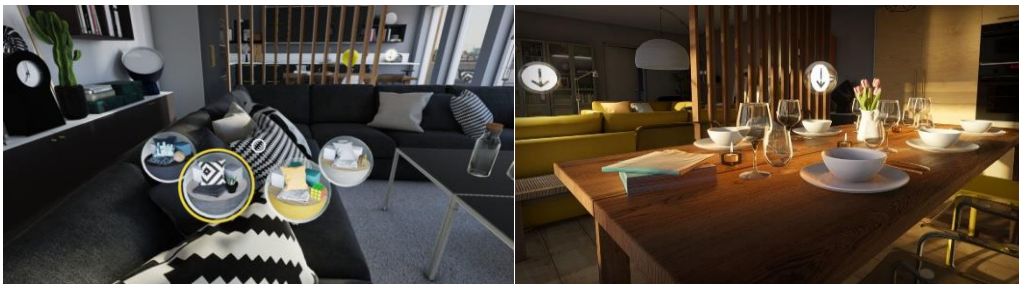


Figure 3: A virtual scenario of changing furniture at IKEA [5].

2.2.2. Enhance User Awareness of the Brand

VR advertisements have the potential to improve brand perception and create a lasting impression on the user. For instance, in a pioneering move, Volvo enabled a virtual test drive of XC90 by using Google Cardboard technology, becoming the foremost marketing brand to attempt so (Figure 4) [7]. Then, assemble the Google Cardboard glasses and fold a cardboard box into a square shape to insert into the lenses. Finally, place users' mobile phone inside the cardboard to view the car interior. The process is environmentally friendly and straightforward. To experience driving the Volvo car and understand its internal functions like intelligent safety technology and stability, users must initially download Volvo's virtual application. This case study reveals that Volvo employs VR video advertising to acquaint customers with their product's attributes, effectively increasing their knowledge and comprehension of the brand through immersive experiences.



Figure 4: Volvo Virtual Test Drive Experience Scenario [7].

The case found that the advantages of using virtual reality to produce adverts is to enhance the viewer's brand awareness through an adventure immersive experience, so that viewers can understand the functions and features of the product, but also able to look at the core values of product development in which.

2.3. Comparison of Advertisements

2.3.1. The Engagement of VR Advertising

According to the study, immersive renditions were also found to be the reason why VR video ads are able to engage consumers, such as Coca-Cola's annual Christmas ad, which uses virtual reality to allow users to play Father Christmas skiing in a sleigh in an icy virtual environment, allowing those experiencing the ad to travel around Poland as Father Christmas does (Figure 5) [5]. Through this experiential case study it was found that the benefits were increased audience engagement and emotional resonance with Father Christmas, everyone is more familiar with the characters, increasing audience attention and recall of the Coca-Cola Christmas advert, the disadvantages were that the production needed to provide characters and stories that resonated with the audience to ensure that the audience was immersed in it and enjoyed the enjoyment and experience of the trip to Poland.



Figure 5: Christmas advert virtual experience scene [5].

2.3.2. Comparison of VR Adverts and Traditional Adverts

Through the analysis of virtual reality advertising we understand VR advertising, VR advertising is characterised by an increased sense of being in a virtual environment, so that the user has a positive psychological impact, VR advertising can produce a higher degree of vividness and immersion [8].

The two-dimensional advertising is flat, the content is simple and clear, generally static or dynamic, can be tried in a variety of media equipment, but in the application of virtual reality advertising compared to traditional advertising has advantages and shortcomings, through the above case to make a comparison (Table 1).

Table 1: The comparison of virtual reality advertising and traditional advertising.

Aspect	VR advertising	Traditional advertising
Immersive experiences	For example, Marriott's Virtual user travel experience provides travellers with a sense of immersion and creates an immersive experience.	Presented in a two-dimensional flat or video format, it does not provide a sense of immersion.
User engagement	Can improve audience engagement and interactive experience. Can interact better with users.	Audiences are usually passive viewers and less engaged.
Creative expression	Innovative, free-flowing and able to provide a more personalised experience.	Creativity is limited by print or video formats.
Target user targeting	Ability to more accurately locate and engage target users.	Reaching a wider audience through mass media with a relatively vague positioning.
Technical requirements and applicable scenarios	Requires special equipment and technical support for specific scenarios. And it is more expensive.	Suitable for a wide range of media formats, no special equipment required.

By analysing three aspects of VR video, namely product demonstration, brand storytelling, and immersive experience, and comparing the advantages and disadvantages of VR ads and traditional ads, it was determined that VR technology can enhance the user's experience. However, the higher-end VR videos necessitate a significant amount of equipment and are comparatively more expensive, which constitutes their main drawback.

3. Problems Facing VR Video

Despite the remarkable growth of virtual reality video in advertising, it also faces many complex issues and challenges that require in-depth research and solutions. There are several issues that VR video may now face. Technical requirements and equipment limitations.

First of all is the technology of VR video needs very powerful equipment and software, virtual reality advertising needs special hardware and technical support [9], such as equipment on the virtual head-mounted display devices, sensor controllers, etc., 3D audio system, etc., in the equipment on the good virtual reality equipment is expensive at present, which increases the technical threshold and cost of the production technology and viewing. Some users may not have the proper VR equipment, resulting in adverts that cannot all achieve the purpose of interacting with and allowing viewers to experience. Technically, there is currently limited standardisation and presentation of VR technology, and each developer of VR videos may have their own specifications and technology-related features.

The lack of standardisation makes it difficult to make changes to faults that occur. Therefore, there is still a need for development in terms of technical requirements and equipment limitations.

Secondly, creating VR video adverts of high-quality demands additional time and financial investment, as well as a purchase price for VR headsets that may be out of reach for many consumers. For instance, the base model of the Oculus Quest 2 VR headset costs £300[4] and can be used without a computer, while many other models rely on a VR computer to function. Indicating that managing VR applications, VR computers, and headsets requires a computer equipped with a high-end graphics card, the cost of such equipment can be prohibitively expensive. As a result, small businesses and those with limited budgets are restricted in their ability to access branded VR applications. Compared to VR advertisements, traditional advertisements have lower production costs and are accessible to the general public. Traditional advertisements are a simpler option which do not require additional equipment. Traditional advertisements are simpler and do not necessitate additional equipment. Traditional adverts save a great deal of labour and capital investment in contrast to VR videos, because they are less expensive and time-consuming to produce. Therefore, a comparison analysis shows that the expenditure and duration of VR video production acts as a barrier to the majority of the general public from experiencing virtual reality as a consumer.

Some viewers of VR devices may experience uncomfortable reactions including vertigo and nausea [10]. Theoretical research indicates that screen sickness results from a lack of synchronisation between the user's perceived motion and their actual movements. There are various technical factors that may upsurge the chance of experiencing screen-sickness, including positional tracking errors and visual flickering, which can result in the occurrence of screen-sickness. Notwithstanding, screen-sickness is considered one of the most uncomfortable problems associated with VR technology. This could potentially result in a decrease in user retention or inadequate fulfilment of the advertisement's goals.

Specialised equipment is required for users to watch VR video adverts, which are not accessible at all times and in all locations [4]. For instance, The North Face utilizes virtual reality technology to enable consumers to immerse themselves in polar surroundings. However, this experience is only accessible by visiting offline brick and mortar shops, where customers require specialized equipment to engage with it. The necessity of using VR devices in specific surroundings is a constraint of VR video, which may result in diminished viewership and restricted advertisement coverage.

4. Conclusion

This paper analyses the application of VR video in advertising by presenting product demonstration cases. Through two advertising cases, consumers can intuitively and vividly understand the brand and user experience. The paper illustrates the development and advantages and disadvantages of VR advertising in terms of vividness and immersion characteristics. The analysis focuses on the brand's core values and the user's awareness of the brand's storytelling aspect. It demonstrates how VR video ads can boost the user's comprehension of these values and the brand's overall image. A comparative study of VR video adverts and traditional adverts was conducted, revealing both benefits and drawbacks compared to traditional adverts. Finally, this analysis examines various aspects of the technology, including its cost, user experience limitations and the vertigo that VR videos currently pose. Overall, Virtual Reality (VR) presents significant benefits for brand development. However, further research is needed to address outstanding issues. Moving forward, VR video advertising has considerable potential for growth not only within the advertising field but also beyond it.

References

- [1] Snelson, C. and Y.-C. Hsu, (2019) *Educational 360-Degree Videos in Virtual Reality: a Scoping Review of the Emerging Research*. *TechTrends*, 64(3): p. 404-412.

- [2] Lo, W.H. and K.L.B. Cheng, (2020) *Does virtual reality attract visitors? The mediating effect of presence on consumer response in virtual reality tourism advertising*. *Information Technology & Tourism*, 22(4): p. 537-562.
- [3] Yung, R. and C. Khoo-Lattimore, (2017) *New realities: a systematic literature review on virtual reality and augmented reality in tourism research*. *Current Issues in Tourism*, 22(17): p. 2056-2081.
- [4] Hamad, A. and B. Jia, (2022) *How Virtual Reality Technology Has Changed Our Lives: An Overview of the Current and Potential Applications and Limitations*. *International Journal of Environmental Research and Public Health*, 19(18).
- [5] De Gauquier, L., M. Brengman, K. Willems, and H. Van Kerrebroeck, (2018) *Leveraging advertising to a higher dimension: experimental research on the impact of virtual reality on brand personality impressions*. *Virtual Reality*, 23(3): p. 235-253.
- [6] Brengman, M., K. Willems, and L. De Gauquier, (2022) *Customer Engagement in Multi-Sensory Virtual Reality Advertising: The Effect of Sound and Scent Congruence*. *Frontiers in Psychology*, 13.
- [7] Song, H., et al., (2020) *Virtual reality advertising with brand experiences: the effects of media devices, virtual representation of the self, and self-presence*. *International Journal of Advertising*, 40(7): p. 1096-1114.
- [8] Tussyadiah, I.P., D. Wang, T.H. Jung, and M.C. tom Dieck, (2018) *Virtual reality, presence, and attitude change: Empirical evidence from tourism*. *Tourism Management*, 66: p. 140-154.
- [9] LaRocco, M., (2019) *Developing the 'best practices' of virtual reality design: industry standards at the frontier of emerging media*. *Journal of Visual Culture*, 19(1): p. 96-111.
- [10] Hamad, A., <Ayah Hamad - Final Thesis - Two Wheelistic.pdf>. 2021.