

Advertisements in Virtual Reality

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Abstract

As more people begin to turn to virtual reality for entertainment, a new platform for advertisements will also emerge. Virtual reality will provide companies with a new way to reach consumers. It is therefore important to understand how to best attract those consumers using this new technology. In this paper, I will delve into some of the advertising techniques used in the real world, and how researchers suggest advertising in virtual reality should be approached. I will then provide some examples of the advertisements I incorporated into a Unity scene following some of the suggestions made by several research papers. In the end, I will also analyze how these virtual reality advertisements were perceived by several viewers, in order to understand which types of ads should be developed further.

1. Introduction

As technology becomes more advanced, new entertainment platforms also emerge. These new platforms can also cause a social shift in which a large number of people choose these new platforms as their main source of entertainment over other existing platforms. Before television, people would get their news and entertainment through the newspaper. Once the television was invented, people were able to choose which platform to dedicate their free time to. A similar shift occurred when the internet was invented and many people chose to spend more time online instead of watching television. Each time one of these shifts occurred, a new marketing opportunity was created. Companies were able to use the new technology to develop new types of advertisements to reach more consumers.

1.1. Motivation

It is important to look back at the past shifts from one entertainment platform to another, because it is very likely that we are entering a new shift. Virtual reality has been

introduced to the public, but it is not widely used yet. Once it is something that is common in most households, it is possible that many people will choose to spend their time using virtual reality instead of using older forms of entertainment such as the television. This will create a perfect platform on which companies can advertise. As one paper suggested, “advertising in virtual worlds is likely to follow some aspects of the same learning curves as other new media, there are some clear parallels to be drawn in terms of consumer behavior” [1]. In order to be prepared for this new advertisement platform, it is necessary to first examine what makes virtual reality different from other existing modes of advertisement. Given that information, one would be able to use all of the new technology available in virtual reality to create advertisements that are appealing to consumers.

2. Related Work

Today, people are exposed to advertisements on every entertainment platform they use; television, video games, and the internet. The main strategy used to capture a consumer's attention is to create advertisements that use colorful images and memorable wording. The ad is then presented to the consumer as often as possible. This onslaught of advertisements has become so common that the average person has become desensitized to most of the main advertisement strategies. In an attempt to once again capture the attention of consumers, companies have responded to this development by creating advertisements that are considered “more colorful, more vibrant, bigger, faster-paced, louder, and more obnoxious” [4]. Even this newer approach has seized to be very effective.

2.1. Interactivity

Instead of trying to create “vibrant” advertisements in virtual reality, it could be more beneficial to use some of the new aspects introduced by virtual reality to create new types of advertisements. In virtual reality, a consumer can be given the experience of a one-on-one interaction with a specific product. This “interactive advertising” could be

what will allow advertisements in VR to capture the attention of consumers by “avoiding the obtrusiveness of classical ad formats and thus counteracting media users psychological reactance” [2].

This idea of interactivity, is simply a characteristic given to an ad that allows the user some sense of control over how they view the product being advertised [4]. In virtual reality, this could be as simple as allowing the user control over when the ad is displayed. An ad can also be made more interactive by adding a 3D model of the product being advertised. Interactivity through 3D models, “helps build brand awareness and enables users to experience facets of the virtual or real-life product in 3D” [1]. Users would not only be able to see a life-sized version of the product; they could also potentially view the product from various different angles. This is not something that can be accomplished using traditional forms of advertising.



Figure 1: A 3D model in a virtual computer world. [1]

One study in particular, focused on exploring the use of 3D models in virtual online worlds and the reaction that consumers had to these models. This paper found that the customers who experienced an ad that used a 3D model of the product were more receptive towards the brand. These customers were also more likely to say that they would purchase the product, compared to the consumers who were only shown a traditional 2D ad [3]. By incorporating 3D models in virtual reality ads, it would be possible to make the ad more immersive and interactive.

2.2. Presence

Other papers explored the idea of the “presence” created by advertisements in traditional media and in virtual reality. They then explored how presence affects how consumers react to the product being advertised. This idea of “presence” can be described as the extent to which a person feels present in the environment that the medium has created. Researchers discovered that the better the presence, the more effective the ads [4]. The presence created by an advertisement is greatly influenced by how easily a customer is able to think of the product being advertised as real and not as

the simulated object that it really is. Having a 3D model instead of a 2D representation of a product is a good step toward increasing the presence of an ad.

Another factor that can also increase the presence of an advertisement is slightly counter-intuitive; how obvious is it to the viewer that the ad is actually an ad? The more a product is immersed into an environment, the better the presence of the ad. In traditional media, product placement has been used to advertise products in a more subtle manner. Product or brand placement advertising, simply means that instead of the product being mentioned directly, it is instead placed somewhere within a movie or television scene where it is easily viewable to the audience. Through this method, the viewer may not always pay much attention to the product, or even remember seeing it at all. This is actually a good thing.

One research paper discovered that it is beneficial to the success of an ad if the viewer does not know that something is being advertised to them. This paper saw that after an ad, “the lower the brand recall and recognition...the more preferred a brand also is” [2]. If viewers see a product without paying much attention to it, it would still be stored somewhere in their memory. In the future when they are shopping, they may then be drawn to that product. In contrast, if viewers recognize the brand and identify something as an ad, they may subconsciously rebel against the advertisement [2]. In virtual reality, it would therefore be most beneficial to create environments that have 3D models of products that need to be advertised. These products would blend into the environment by appearing to be integral parts of the scene. This would ensure that the presence created by the ad is higher, which would then leave the consumer with more positive feelings towards the product being advertised.

2.3. Evoking Emotions Using Presence

Another research paper focused on how the sense of presence in a virtual environment can be used to evoke emotions in the viewer. The researchers behind this paper, created three identical scenes. They varied the lighting, shadows, and some small objects within each scene in an attempt to evoke a different emotion in each scene; relaxation, neutral, and anxiety. In the end, they were able to successfully elicit the desired emotions from their test subjects. They also discovered that the “sense of presence [was] greater in the “emotional” environments: It is more likely that an environment that is able to elicit anxiety, relaxation, etc. could make users feel more present in that environment” [5]. In a virtual reality scene containing advertisements, it may be useful to attempt to evoke a positive emotion through the virtual environment. Not only would this “emotional” environment improve the presence of the ad, it could also help the user associate the pleasant emotion they experienced in that environment with the product being advertised.

3. My Implementation

Using the ideas presented in the related research papers, I incorporated some advertisements into the Unity scene I created. The scene is meant to depict an average street within a normal American city. The point of view of the camera can be interpreted as either being from the point of view of someone walking down the sidewalk or of someone driving down the main street. There are buildings on either side of the main street, a hotel and some stores, as well as some cars driving on the street. These objects were added to make the scene seem more realistic and familiar to the viewer, but they were also used as forms as advertisements.



Figure 2: The final virtual reality scene.

In order to build the main foundation of the scene, I focused on the idea of evoking emotions using presence which was presented in *Affective Interactions Using Virtual Reality* [5]. That paper discovered that a well-lit scene, without harsh shadows, would evoke more positive emotions. Not only did I make sure my scene was bright and inviting, I also tried to make it seem like the viewer was looking at a street in a typical American city. By doing so, the scene would be something most viewers would find familiar and comfortable. If the viewers feel like they are looking at something that is familiar, they may be more receptive to the products being advertised.

3.1. Real World Ads

The first form of advertisements I placed in my scene were ones that I believe would be the most obvious and familiar to the viewer. They were ads that one could easily find on the side of a real city street. In my virtual reality scene, there is one billboard advertising Coca-Cola on one side of the street and another billboard on top of a building with a picture of an iPhone and advertising Apple. The images I used to create these billboards were images that were used for real-world billboard advertisements in cities across the United States.

There are some slight differences between the two billboards. The Coca-Cola advertisement is larger, closer to the center of the image, and has the Coca-Cola brand name



Figure 3: A billboard advertisement for Coca-Cola.



Figure 4: A billboard advertisement for the Apple iPhone.

clearly on the billboard. The Apple advertisement on the other hand, is slightly farther from the center of the image since it is on top of a one of the scene's buildings. It also has a picture of an iPhone and a tagline on the billboard, without the Apple name or logo present anywhere. I included these two different types of billboards to see if the viewers had different reactions to each of these ads.

3.2. Product Placement

As previously mentioned, one way to increase the presence created by a scene is by making advertisements less obvious by using product placement. One way I incorporated this idea into my scene, was by making most of the buildings in the scene into commercial buildings. I added a Hilton hotel, a Nike store, and a Target store.

These buildings are meant to make the scene appear more realistic by helping construct the idea that this particular street is in the commercial part of a city. The brands chosen to depict the stores and the hotel serve as more subtle forms of advertisements in the scene. It seems reasonable to believe that, in the future, commercial buildings in virtual reality scenes will be considered great advertisement real estate. The opportunity to place a brand's name or logo on one of these buildings will likely be auctioned off to companies who want to make their brand more visible to a wider audience. The exact placement of the building within the



Figure 5: A Hilton Hotel within the scene.



Figure 6: A Target store present in the scene.



Figure 7: A Nike store in the scene.

scene may also affect how much companies are willing to pay to place their logo on that particular building. Buildings in the foreground of the scene would be more likely to capture the viewer's attention and would therefore be more popular as advertisement locations.

3.3. 3D Models

Another element I incorporated into the scene, was the idea of using 3D models of products for product placement advertisement. I included two 3D models for two different car brands: Lamborghini and Mitsubishi. These cars are meant to appear to be natural parts of the scene, since you would expect cars present on any typical city street.

Similarly to the commercial buildings, the brands chosen to depict these 3D models would be receiving more exposure to the virtual reality audience. The 3D models of the cars would also give the viewers a better idea of what these



Figure 8: A 3D model of a Lamborghini car.

cars may look relative to other objects in the real world. This approach would be more intimate and allow the viewers a deeper sense of connection with the product. A level of connection that cannot be achieved through 2D advertisements like TV commercials.



Figure 9: A 3D model of a Mitsubishi car.

3.4. Results and Analysis

Since advertising is something that is heavily reliant on the perception of viewers, I decided to gather some feedback on how the advertisements in my scene were perceived by different people. I asked five people to view my scene for a couple of minutes. I then asked them to answer a few simple questions regarding the atmosphere they felt the scene created and the products they believed were being advertised.

3.4.1 Atmosphere Created by the Scene

The first question I asked was meant to evaluate what sort of atmosphere — if any — the viewer felt that the virtual reality scene created. Ideally, we would want the viewer to have positive emotions when viewing the scene so that in the future they would associate those emotions with the brands being advertised. The first question presented was:

On a scale of 1-10 how likely are you to associate the following words with the scene you just viewed?

	Person 1	Person 2	Person 3	Person 4	Person 5	Average
Relaxing	5	4	5	8	6	5.6
Familiar	6	9	7	7	8	7.4
Neutral	6	5	7	5	6	5.8
Stressful	1	4	3	4	2	2.8

Figure 10: Viewer ratings of how much they relate the different emotions with the scene.

From the ratings gathered from the different viewers, we can see that, on average, the word most associated with the scene was familiar. This suggests that most users view the scene as something that they have seen before and are therefore comfortable with the scene. Having this sense of familiarity is good because it can make the viewer more receptive towards the ads in the scene.

The other positive feeling of relaxation only received an average score of 5.6 and the neutral feeling received an average score of 5.8. Considering that the familiar feeling scored a high average, it is okay that relaxation did not score as high since we only need one positive feeling associated with the scene. It is also preferable that a viewer feels that a neutral atmosphere was created in the scene instead of a stressful atmosphere. Fortunately, the stressful feeling only received an average score of 2.8 so the viewers did not associate negative emotions with the scene.

3.4.2 Ads Recognized in the Scene

Next, the subjects were asked to answer another set of questions without looking at the scene again. These questions were meant to provide more insight on how obvious the advertisements in the scene are to a general audience. The related works mentioned that ads are actually considered more successful when the viewer does not perceive them as advertisements. One particular paper went on to explain that once an ad is identified as an ad, it is seen “as an attempt to persuade” and this leads the viewer to a subconscious “rejection or resistance to persuasion” [2]. It was therefore important to me to know which of these ads were actually seen as advertisements in order to discover which of the ads were the most successful. The questions I asked were:

How many advertisements did you see in that scene? For which brands?

	Person 1	Person 2	Person 3	Person 4	Person 5	Average
Number of Ads Seen	4	4	3	3	3	3.4

Figure 11: Number of ads each viewer saw in the scene.

	Person 1	Person 2	Person 3	Person 4	Person 5
Nike	X		X	X	X
Target					
Coke	X	X	X	X	X
Apple	X	X	X	X	
Hilton	X	X			X
Lamborghini		X			
Mitsubishi					

Figure 12: Viewer response of the brands they saw in the scene.

The advertisements that were remembered the most were the billboards and a couple of the brands on the buildings. The viewers were also asked to elaborate why they believed these were the ads they remembered. Most said that they remembered the billboards because those are the types of advertisements they see in their everyday lives, so they were easy to spot and remember. The Nike store was also often recognized as an ad because it was towards the front of the image and the viewers were familiar with that brand's logo.

Once the viewers listed the advertisements they believed they saw in the scene, I gave them a list of all the ads in the scene and asked them another question. I asked:

On a scale of 1-10 how likely would you be to classify each of the following as advertisements?

	Person 1	Person 2	Person 3	Person 4	Person 5	Average
Nike Store	8	5	7	9	9	7.6
Target Store	4	5	5	2	2	3.6
Coke Billboard	9	10	10	8	10	9.4
Apple Billboard	8	10	10	9	4	8.2
Hilton Hotel	3	4	4	5	8	4.8
Lamborghini Car	1	2	9	5	6	4.6
Mitsubishi Car	1	2	6	3	4	3.2

Figure 13: Viewer response on how obvious the ads in the scene are.

I also asked the subjects to explain their reasoning behind the ratings they gave to how likely they were to classify each of the objects as advertisements. As previously mentioned, both the billboards were said to be easily recognized as ads because those were the type of advertisement the viewers were the most familiar with. Even between the two billboards, there were some differences in the ratings the viewers gave. One person in particular, gave a much lower score to the Apple billboard. He did so, not only because the Apple billboard did not capture his attention, but also because he did not see any logo or brand name on it so he did not view it as an ad.

The commercial buildings received much lower scores, suggesting they were less recognizable as ads. The viewers said that this was because they saw them as objects being used to make the scene look more realistic and not as advertisements. Given the scores that the viewers gave to all the buildings and the reasoning behind those scores, I was able

to draw some conclusions. The first, was that the visibility of the brands name and logo influenced whether viewers saw the building as an ad. The more visible, the more likely they were to classify it as an advertisement. The second, was that the popularity of the brand also affected whether it was classified as an ad. The more easily people were able to recognize a brand's logo on a building, the more they viewed that building as an advertisement.

The Nike store received a high score because it was the most visible and it had a very recognizable logo. The Target store, on the other hand, was not very visible in the scene. Many of the viewers did not give that building too much attention, which caused them to not see the store as an ad. This then resulted in an average score of 3.6. Even though the Hilton Hotel was more visible, the hotel chain's logo was not something that everyone recognized, which resulted in an average score of 4.8.

The 3D models of the cars were the least likely to be recognized as ads. The average score given to the Lamborghini car was only a 4.6 and the Mitsubishi had the lowest average score of only 3.2. The viewers said that, much like the buildings, they saw the cars as models used to make the scene more realistic and not as ads. Something interesting that I observed, came from the only subject that recognized the Lamborghini car as an ad. He thought the car was an ad because he was able to easily recognize the Lamborghini style and logo. Although he did not remember the other car as an ad the first time he viewed the scene, once he was asked to rate each, he did give the Mitsubishi car a relatively high score. This was because once he classified the Lamborghini as an ad, he assumed that the other car might be an ad too. Even if he did not recognize the brand. This was interesting because it showed that how a viewer perceives a particular ad, can actually change their perception of other ads as well. It can even make viewers aware of ads they may not have noticed before.

4. Future Work

There are a few things that could be done in the future to improve the presence and effectiveness of advertisements in virtual reality. One could be to allow the user more control over the 3D models. For example, a viewer could potentially be able to change the color of the cars or change the model of a car to another model of the same brand. This would increase the amount of interactivity the viewer feels like they have with the products, which may then increase their opinion of those particular products.

Another thing that could be done, would be to expand some of the commercial buildings in the scene. The stores could be altered so that the viewer can go inside them and see 3D models of the products that the store sells. This would give viewers an online shopping experience very similar to what they would experience if they went shop-

ping in the real world. The hotel could also be changed so that customers can go inside and see 3D versions of the different types of rooms the hotel offers. In general, it is most important that in the future the 3D models become more interactive and realistic to make the products more appealing to possible customers.

5. Conclusion

Once virtual reality becomes more widespread, it will create a new platform on which companies can advertise. From traditional media, we know that there are several different possible advertisements that can be used in VR. Based on what I learned from reading research papers and what new information I gathered through my project, I would suggest that 3D models are the best forms of advertisements for virtual reality. They are more subtle, and can therefore be more effective. They would also allow viewers to use the new technology introduced by VR to interact with the products being advertised to them. If I had to make a suggestion on which form of VR advertisement to pursue, I would suggest 3D models.

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