

Virtual reality (VR) tours and their impact on consumers' intention to visit the physical store

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Abstract

Virtual reality is one of the most attractive and promising technologies in the world today, which is rapidly growing and developing. The many capabilities of this technology indicate its diverse applications in the fields of marketing and consumer behavior. The worldwide COVID-19 pandemic caused changes in the behavior of consumers and pushed the way they interact and communicate with various brands toward non-personal channels such as the Internet. These changes have created unique conditions in the way consumers interact, and different companies must coordinate with them and give them the correct answer. An application of virtual reality is the ability to conduct 360-degree virtual tours of the store. This research will investigate and answer the question of whether the use of 360-degree interactive tours based on virtual reality capabilities will stimulate the intention of its audience to visit the store physically or not. Due to its practical results and the method used in it, this research is an experiment, simulation, and survey, which includes two groups of 12 people as a control group and an experimental group, and in two levels: pre-test, post-test, and finally, the recall test. The control group only observed 2D images of the store, whereas the experimental group observed the store environment through a 360-degree virtual reality tour. Data were collected through a questionnaire with appropriate validity and reliability from both groups and in all three levels of pre-test, post-test, and reminder test, and then, through SPSS software, the mean difference and standard deviation difference tests were analyzed. The results of this study showed a significant difference in the intention of physically visiting the experimental group (virtual reality) participants from the store physically compared with the participants in the control group. This

means that companies and marketers can use technologies such as virtual reality to effectively stimulate consumers' behavioral malpractice instead of traditional methods.

Keywords: Virtual Tours, Virtual Reality, VR, 360 Degree Photo, Virtual Reality Tour, Intention to Visit

Introduction

The Covid-19 pandemic and the necessity of observing physical spacing have reduced consumer movements in recent years. Previous researches have stated that these conditions may cause changes in the overall behavior of consumers and that the impact may continue after the pandemic ends. In this case, the provision of current services on the basis of an alternative and new technology is considered very positive (ke et al, 2020; Singh et al, 2020; Itani & Hollebeek, 2021). Virtual reality-based tours, for example, enable organizations to comply with state-imposed social distance or quarantine requirements, while continuing to improve the consumer experience and increase the amount of value created for them (Debusmann, 2020). In previous research, the benefits of virtual reality for management, sales, marketing, and distribution have been identified (Gibson & O'Rawe, 2018; Moorhouse et al, 2018). Before COVID-19, many recreational and historical attractions (such as museums, and theme parks) increasingly used virtual reality technology to create attractive innovations in their marketing offerings (Jung et al, 2018; Lee et al, 2020). However, during COVID-19, virtual reality technology has become an important platform for various businesses, especially the tourism industry, in order to maintain their revenue streams. For example, various attractions, including the Louvre, the Guggenheim Museum, Vatican City, and many others offer virtual tours to their global audience (Itani & Hollebeek, 2021).

Virtual reality-based tours can offer visitors an enjoyable experience (e.g. entertainment), performance (e.g. learning), or social (e.g. collaborative) (Lee et al, 2020). In his research, Moorehouse pointed out that virtual reality applications increase consumer engagement, especially consumers who are unable to physically visit the desired location (e.g., due to a lack of financial, temporal, physical disability, the physical distance between the person and the desired location or mandatory quarantine) (Moorhouse et al, 2018). Due to these expressed benefits, many companies are investing in developing such platforms (Bloom, 2020; Itani & Hollebeek, 2021). The level of technological advancement in virtual reality-based tours is also likely to lead to different assessments of tours by consumers (Hollebeek et al, 2020). In other words, the more advanced virtual reality technology is, the more favorable the virtual tour experience is from a consumer perspective (Wei et al, 2019). Technology-based tours range from various non-all-inclusive programs to fully immersive programs (Beck et al, 2019).

The important issue is that, as mentioned above, due to the existing conditions, many consumers prefer to identify and obtain various and complete information about various products and services provided by different companies, such as the physical environment and so on, instead of using traditional methods. Digital platforms and the Internet are provided for use.

Various methods are available: following the virtual pages of the company of interest in the present or future, visiting the company's website, searching the Internet, introducing virtual reality or augmented reality programs, etc. These alternative methods definitely reduce financial, temporal, intellectual, etc. Costs can also reduce many limitations in the relationship between the desired product or service and the consumer. The main limitations include sanctions-related restrictions, boycotts, time and space distance restrictions, and even financial and political constraints. By providing products and services on digital platforms, especially virtual reality, and based tours, in addition to accelerating the activities of introducing various products and services to different customers regardless of geographical location, the process of financial flows can be improved through digital platforms linked to these technologies (such as cryptocurrencies and international financial accounts).

The advantages stated in the previous section are the reason for the increase in the acceptability of these technologies, especially virtual reality, from the perspective of consumers, and why it is added to the number of people using this technology every day. Paying attention to this emerging market is essential for various companies, organizations, and marketers. This factor indicates the necessity of creating awareness and investment of different companies in these new platforms so that they can provide their services to potential customers in these communication channels, which are increasing the number of users every day. In this study, we want to investigate whether the use of virtual tours created in the form of 360 degrees interactive by virtual reality, relative to the traditional 2D and resident images of a particular store environment, will change the amount of intention to visit that particular store physically or not.

Literature Review

Virtual Reality

Recently, market growth has forced marketing professionals to implement innovative methods to create and deliver more value to customers. In this regard, the use of new information technologies such as smartphones and social networks has been essential for successful retail. Vital developments now require the exploitation of new market opportunities presented by the Internet and virtual reality (Boyd & Koles, 2019; Farah et al, 2019). Therefore, is no surprise that most retailers integrate virtual reality into their new marketing strategies. Virtual reality can improve the consumer experience by personalizing retailers' offerings and enabling them to understand products and services through new technologies (Lee, 2020).

Virtual reality changes the current practices of consumers and retailers' behavior as it is one of the most exciting topics in the field of consumer research, with a high rate of emissions and evolution not only in the field of marketing but also in all industries (Farshid et al, 2018; Kim & Hall, 2019). Currently, most marketers use virtual reality applications to create a place for consumers to test and evaluate products and services before the purchase process (Feng et al, 2019; Pizzi et al, 2019). Virtual reality allows consumers to engage in both real and virtual experiences. These unique virtual reality features occur at all stages of consumer behavior: identifying a need, searching for information, evaluating alternatives, purchasing decisions, and

post-purchase behavior. Jung et al. Stated that virtual reality is a new opportunity for marketers. This technology can create a new point of contact for customers in marketing channels where there is no need to visit and physically attend to the customer. The use of virtual reality technology in marketing is very diverse and innovative. For example, vendors who record a virtual reality video from their stores allow potential buyers to virtually visit that location and have a realistic image without ever visiting the store in person (Lee, 2020; Jung et al, 2018).

Marasco and his colleagues concluded that a satisfactory virtual reality experience improved positive effects on changing the attitude and intention of physically visiting a virtual reality user (Marasco et al, 2018). Huang and his colleagues also found some results that a satisfactory virtual reality experience could affect the user's intention to make a real visit. They examined the impact of virtual experiences on "Second Life," an online virtual game aimed at examining people's intention to choose a real destination, and concluded that experiences in the virtual world evoke the intention to visit the same place in the real world (Huang et al, 2016).

Virtual reality is not limited to the boundaries of entertainment. While people associate the term "virtual" with advanced video games representing an enjoyable experience, virtual reality is increasingly playing a prominent role in the contemporary business landscape (Trendinnick, 2018). Virtual reality has now undoubtedly changed the way shoppers, brands, and retailers behave (Grewal et al, 2017). The importance of virtual reality in the retail world and its impact on the destruction of physical stores can no longer be overlooked or given little priority. In an era of fierce competition, virtual reality has always expanded in the business world, affecting retailers and consumers alike (Grewal et al, 2017).

Virtual reality technology, as a new form of interactive media, allows people to view 360 degrees of desired locations without time and space restrictions. Simply put, virtual reality gives people a sense of physical presence there (Ying et al, 2021). Researchers state that the sense of presence plays a vital role in people's participation in virtual reality and the success of marketing programs (Bogicevic et al, 2019). The sense of presence consists of two main elements: remote presence and a sense of social presence (Algharabat et al, 2018). Remote presence indicates the amount of immersion of users in a virtual environment, which can improve the way consumers collect information and shape attitudes about the destination. The feeling of social presence refers to "the number of other organisms (living or artificial) in the virtual environment" (Ying et al, 2021). Other studies have also stated that remote presence can guide consumers' behavioral processes (Kung, 2020; Kim & Ko, 2019).

Some studies in the field of tourism have emphasized how presence affects brand experiences and customer visit intentions (Bogicevic et al, 2019). Virtual reality technology refers to the use of computer-generated 3D environments by which the user can navigate and interact with them, resulting in the simulation of one or more of the user's five senses. Images and 3D virtual worlds created by virtual reality technology enable customers to obtain useful information from their destination interactively, resulting in improved attitudes toward their destination (Tussyadiah et al, 2018).

In 2020, Kim and his colleagues stated that the use of augmented reality technology in the tourism industry stimulates the desire for real visits. This achievement occurs if the content created in virtual reality creates appropriate cognitive and emotional responses from the audience (Kim et al, 2020). The feeling of being there remotely measures the sense of "being there" in a virtual environment. According to Kung, the sense of remote presence can be determined by the amount of freedom of users in a 3D environment and their level of immersion. Kung's research showed that by increasing immersion in a 3D virtual reality environment, including freedom of movement, etc., the person's sense of presence toward 2D interaction — such as monitors — increased, which changed the rate of behavioral malpractice (Kung, 2020; Leung et al, 2020). The sense of social presence also refers to the extent to which a virtual reality user engages in a virtual space with a real individual image to create a sense of interpersonal and social interaction (Algharabat et al, 2018). Being forced to focus on a video or virtual image creates a greater sense of physical immersion in scenes depicted by virtual reality. This's why using a 360-degree virtual reality camera creates an immersive experience and expresses the environment more realistically and meaningfully. Chessa and his colleagues found that high-end wearable devices can evoke greater levels of presence because users are insulated from the outside world. The audience can watch 360-degree videos in any direction, which puts them in the center of the depicted scene, creating the feeling that they are experiencing a real place alongside other people depicted in the scene (Chessa et al, 2016).

Virtual reality technologies are able to create interactive and digital environments to give users the illusion of moving to another specific location, as well as these technologies can simulate various tasks. To achieve this, a set of technologies (such as screens on the head, input devices, imaging equipment, etc.) can be used to create an interactive environment with a digitally simulated scenario (Cavallaro et al, 2021). According to Stuart, virtual reality is a technology full of potential that has yet to resub mack its place in market research. For example, combining virtual reality and 360-degree videos to create some new marketing experiences has not yet been meaningfully exploited (Stuart, 2018). Today, with the advancement of imaging equipment, we are witnessing a significant increase in the quality of content presented on the virtual reality platform so that the existing boundaries between digital and reality are fading. The user who uses virtual reality technology sees themselves as a product or service center (Israel et al, 2019).

The COVID-19 pandemic underscored the need for new marketing solutions to enhance the remote experience of products and locations. Virtual reality can be used to ensure an interactive and engaging tour with the scope of emotional impact on the user and to raise awareness of the culture of a particular product and its origin, and to encourage customers to visit the real physical environment they have interacted with through virtual tours based on the virtual reality experience (Baek et al, 2020).

Virtual reality tools are able to digitally rebuild the real world, including spaces and objects, that can create attractive interactions with products and store locations through the right

devices. Virtual store simulation can have a positive impact on consumers' purchasing decisions by showing the product features and remote store environment. For example, companies can offer an all-inclusive virtual tour to potential customers capable of simulating the real interaction with the store environment and products (Hasrmann & Siegrist, 2019; Cavallaro et al, 2021). Advanced digital technology has changed the way customers plan and search for information today. Customers have no location and time limits to experience potential destinations before they actually visit. Today, smart technologies such as virtual reality have changed traditional ways of experiencing people in different places. Through the digitally adapted environment, virtual reality allows customers to experience products, services, or locations before they buy (Chung et al, 2015; Tussyadiah et al, 2018). As technology advances, customers are easily engaged in virtual environments. With affordable virtual reality-supported devices such as Google Cardboard or existing virtual reality content (such as maps or 3D content, web-based or mobile applications), customers can experience virtual tours from anywhere in the world with an exquisite and realistic experience. The use of virtual content is not limited to cities, hotels, and restaurants, but can also be used in other cases. It should be noted that virtual reality applications are at the beginning of their way in the marketing industry and we will see significant improvements in the future (Lee et al, 2020; Tussyadiah et al, 2018). Virtual reality gives marketers the opportunity to provide potential consumers with the most realistic experience of a product, service, or location at the same time without the necessary physical location. Using virtual reality devices or content, the client can experience the virtual environment as if he was there (Lee et al, 2020).

In 2017, Berg and Vance stated that through virtual reality, people can experience the feeling of being real in a "different place" above and beyond the information available from computers. Since "another location" can be a retail store, shop, restaurant, hotel room, tourist destination, etc., virtual reality has a high potential for marketers to promote their products and services. They also stated that visualization, interaction, and experience of a product or service can engage customers and increase the likelihood of visiting, purchasing, and using the product. Virtual reality has the potential to become a very effective marketing tool. Some previous researches have shown that the virtual interaction arouses positive emotions in a person, in which case it may be possible to actually increase the intention of visiting an environment (Deng et al, 2019; Berg & Vance, 2017). Technology has always been at the forefront of all kinds of imaginative thinking to enhance the customer experience. Over the years, with the onset of various stories, robotics, holograms, and so on, the human mind has understood the concept of the relationship between reality and cyberspace, and in many cases has felt the need to do so (Farah et al, 2019).

360 Degree Pictures & Videos

Previous research showed that 360-degree images and videos lead to more interaction by viewers with content. In this case, the likelihood of a person clicking on videos and watching

them thoroughly in order to obtain more information increases (Adachi et al, 2020). Images and videos recorded by 360-degree cameras can be viewed using a mouse on a computer screen. Another method by a smartphone is that the user can look around by turning the phone with their hands. Another way to interact with virtual reality is to use virtual reality headsets, also known as head-mounted displays or HMDs.

HMDs are worn like helmets on the head and have two displays, one for each eye. To experience a 360-degree view, the person moves their head as they look around in a real environment. HMDs sense the rotational movement of the user's head and display images accordingly, allowing the user to have a personal first view of the virtual world in any direction. The delay between HMD motion tracking and image display is almost insular, which is why the immersion and comfort of the audience in a virtual environment are maintained (Adachi et al, 2020). Currently, many physical stores publish descriptive images and videos of their store on online platforms. The relationship between online and offline stores can be complementary to competitive (Fornari et al, 2016; Wang & Goldfarb, 2017). For example, Alphabet has provided Street View software to display 360-degree virtual reality images of the store environment for different retail outlets. Even though consumers can not really walk in cyberspace, they can interact with virtual reality by looking around - left, right, up, and down - and thereby view the shop as if they are standing in the middle of it (Riester & Van vliet, 2015).

In their study, Verhagen et al. Focused only on online shopping spaces and did not measure visitors' intentions in relation to visiting physical stores. There are few pieces of research on the effects of online space on the physical space of the store, but this is critical because consumers often use online and offline channels simultaneously when shopping. So, it's very interesting for retailers to know if they have a rich image on their website instead of a poor photo, or not, more customers will come to their physical store. The intention to physically visit audiences by a virtual reality photo is expected to be at its highest level and by a typical photo to be at the lowest, as consumers' behavioral ode, such as the intention to buy or intend to visit, increases with the quality of a photo (Verhagen et al, 2014). Virtual reality content depicts the store more realistically. This rate is 360 degrees lower in photos and at its lowest in normal photos. For this reason, it can be concluded that consumers who have viewed the shop or store through virtual reality images or videos are likely to consider the shop more capable, and their temptation to visit the store increases (Moes & Vliet, 2017).

Virtual Tours

Virtual Tour is a computerized experience of visiting a specific location in a virtual environment that allows people to visit a specific destination/location (e.g., using 360-degree photos and videos or using virtual reality technology). In this case, consumers can experience the store in a "seemingly real" environment without having to travel physically (Park et al, 2018; Spielmann & Mantonakis, 2018). New and new communication technologies such as virtual reality and augmented reality, help retailers provide consumers with various experimental content without any time and place restrictions. Compared to inactive media (TV, radio, or a

website), these technologies provide consumers with a more interactive experience (attractive content such as 360-degree photos and videos, and active feedback from audiences such as spin and movement) (Dooley, 2017).

"Virtual tour" is defined as an experience in a virtual context through a smart device. A virtual tour is based on virtual reality technologies that require constant communication with real and virtual elements (Javornik, 2016). While augmented reality allows consumers to space a virtual object in a related context in reality (Yaoyuneyong et al, 2016). Virtual reality allows users to immerse themselves in an environment and gain engaging experiences. If used correctly, the content offered on virtual tours will perform better in several ways than the content provided through traditional media such as normal images and 2D videos and improve people's attitudes (Burigat & Chittaro, 2016; Feng, 2018). Virtual tours can produce favorable results by creating a remote presence, defined as the mental state of "being there" in a seemingly real experience, without the need for physical presence (Spielmann & Mantonakis, 2018). Remote attendance can have positive impacts on consumer attitudes and increase the intention to buy or visit an online store (Orth et al, 2019). Research conducted in the tourism industry stated that virtual tours of specific destinations can increase consumers' desire to visit physical and real destinations (Chung et al, 2018; Marasco et al, 2018).

Intend to visit

Due to the increasing use of virtual reality technologies as well as virtual tours based on them, numerous types of research in the tourism industry show that virtual visits in the form of virtual reality experiences or 360-degree interactive platforms as virtual tours of a tourist destination will increase the intention of visiting the audience of this type of content from the actual destination of that place (Chung et al, 2015; Ditzinger et al, 2017; Jung et al, 2016; Chung et al, 2018; Marasco et al, 2018). Of course, among the relevant research literature, the intention to physically visit a retail or store environment, after experiencing it through virtual reality, virtual tours, etc., has been less measured. Research conducted by Dennis et al. And Morgan Thomas and Veloutsou showed that the experience of a brand virtually has a direct impact on behavioral intentions in the audience, followed by visiting intentions (Dennis et al., 2014; Morgan- Thomas & Veloutsou, 2013).

It can be noted that by increasing audience engagement in the content provided through attractive environmental design as well as creating brand awareness for them, people's intention to visit an environment will increase (Ferns & Walls, 2012; Horng et al, 2012). In their research, Hyun and O'Keefe designed a model of "virtual destination image formation based on the concept of virtual presence". The results of their researches stated that cognitive content (perceptual), as well as emotional (emotional) content in virtual reality experiences or 360-degree tours, will have a direct impact on the intention of action in people. The study stated that the feeling of remote presence impacts the created cognitive image, and that this cognitive image

itself is effective in shaping the emotional image of the destination, resulting in an impact on behavioral intentions and visiting intentions (Marasco et al, 2018; Hyun & OKeefe, 2012).

By studying the Second Life game, Huang et al. Concluded that the experience of a virtual destination in the game creates the need for more information about the destination observed in people, and also the intention to visit that place in the real world will increase (Huang et al, 2012). In the next study conducted by Huang et al., they used the technology acceptance model and hedonism theory to identify related factors in creating interest in future trips. Their study stated that perceived ease of use and usefulness have a direct and positive relationship with people's behavioral intentions (Huang et al. 2013). In recent years, due to the rapid advances of virtual reality devices and related tours, many researchers have investigated the degree of acceptance by consumers and its use by tourists in order to determine the impact of these technologies on people's behavioral intentions as well as the intention to visit physically (Disztinger et al, 2017; Gibson & O'Rawe, 2018). In another study, tourists' experience of 360-degree virtual reality tour content was qualitatively measured. The findings of this study stated that the use of virtual reality and 360-degree tours will strengthen people's behavioral intentions for visiting the shown destinations (Jung & Dieck, 2017).

Table 1: Summary of recent researches related to the topic

No	Year	Title	Industry	Authors	Description
1	2021	Virtual reality in destination marketing	Tourism	Tianyu Ying et al	The results of this research indicated the existence of a positive relationship between the use of virtual reality and the intention to choose a destination
2	2021	The effect of a 360-degree virtual tour on reducing psychological stress caused by COVID-19	Tourism	Ting Yang et al	The results stated that the effect of virtual tours on reducing stress is direct and causes an increase in the intention of physical visits
3	2021	A light at the end of the tunnel: Behavioral appeals of virtual reality tours during and after covid-19	Tourism	Omar s. Irani & Linda d. Hollebeck	The results stated that factors related to social distancing in virtual tours increase people's intention to visit
4	2021	Hazara virtual reality experiences before and after covid-19	Tourism	Hyunsu Kim et al	This research showed that virtual reality, by creating a sense of entertainment, creates the intention to visit in people
5	2020	The use of pervasive virtual technology in consumer retailing and its effects on the consumer	retail	Won Jun Lee	This research stated that emotions (as opposed to logic) cause a greater impact on the audience and ultimately physical visits
6	2020	Investigating the effect of online flow atmosphere and cues on visit intention	Tourism	Tamather Shatnawi et al	The results of this research show that both the atmosphere and the online trends affect people's intention to visit
7	2020	Does virtual reality attract visitors? The mediating effect of presence on consumer response in virtual reality	Tourism	Wai Han Lo & I'm Not Afraid Benjamin Cheng	The results of this research showed that the power of virtual reality in attracting people to visit is the same as traditional methods

		tourism advertising			
8	2020	Using virtual reality for tourism marketing: the mediating role of sense of presence	Tourism	Renan Adachi et al	The researchers stated that the use of virtual reality will only improve the image of the destination and will not affect the intention to visit
9	2020	Introduction to virtual tours of retail stores: How store brand experience can increase visit intention?	retail	Eunsoo Baek et al	The results of this research showed that the increase in brand experiences will increase the intention of customers to visit
10	2020	The quality of virtual reality and its effect on behavioral intention	Tourism	Minwoo Lee et al.	The results show that increasing the quality of the system and content will directly affect people's behavioral intention
11	2020	Emergence of 360 degree technology climate for tourism destination marketing	Tourism	Sima Rahimizhian et al	The results of this research stated that 360-degree images and videos will attract consumers and develop and improve their behavioral intentions.
12	2017	Online attractions of physical stores	Clothing stores	Anne moes & Harry van vliet	The results of the research show the direct and positive impact of using virtual tours in the development of the audience's intention

Most studies on virtual reality, 360-degree images and videos, and virtual tours are related to the tourism industry. Considering the external researches discussed in the field of research background and also the high potential of virtual reality technology, it can be stated that most of the applications of this technology in marketing, especially consumer behavior, remain pristine and undiscovered. Foreign research examining the various applications of virtual reality technology in consumer behavior has been a handful. Also, no research was found in Persian sources about the use of virtual reality technology in the fields of management, marketing, consumer behavior, or advertising. In addition to the lack of such research in Persian resources, which indicates the low attention of researchers in marketing fields and consumer behavior to this technology, in external researches, researches that have investigated the amount of changes in the intention of physical and face-to-face visits to the store, after experiencing and viewing the store in the virtual reality environment and its based tours and comparing it with traditional methods, have not been conducted. Therefore, the present study, in addition to filling the gap in this field, by presenting its practical results, will lead to better and more effective decision-making by marketing managers regarding the use of this technology and virtual tours.

Research Methodology and the Statistical Population

This study is applied research and according to its methodology, it can be considered as experimental research, along with two experimental and control groups, in three levels of pre-test, post-test, and recall test or follow-up test (in order to assess the mental maturity error of the participants). The statistical population of this study consisted of all buyers of clothing in Arak city. 24 subjects were selected using the available purposeful sampling method. Participants

joined the study after initial studies and had the necessary conditions. The researchers chose the following conditions to improve the results: 1- having at least 20 years of age, 2- maximum participating age under 60 years, 3- lack of virtual reality technology experience before this study, and 4- the absence of migraine disease. Different people have become accustomed to that technology over time after numerous uses of a particular technology, and the process of emotions and emotional reactions to that new technology will be downward over time. For this reason, the use of the third condition when selecting participants in this study were performed in order to be aware of the initial emotional responses formed in the person after the first encounter with virtual reality-based tours in order to investigate the possible changes occurring in that person's behavioral code (in this case, emotional and logical emotions due to the first encounter were at their highest level). This factor makes it much easier and more accurate to measure and differentiate results. After examining the participants about having the above conditions, they were randomly divided into two groups of control, including 12 people, and the virtual reality group, 12 of them.

Tools used in research

As a first step, researchers investigated the existing clothing stores in Arak. After comparing and analyzing the factors affecting the internal environments of the store (including the presence of suitable light, the existence of adequate space, the presence of men's and women's clothing, and such factors), one of the branches of the "Kenny Boy" chain store was selected. In the next step, the researchers recorded the required images from the Kenny Boy clothing store in the form of 360-degree images using the Insta360 ONE X2, a sports camera with two 180-degree fisheye lenses and the ability to record 360-degree images and videos in 5K quality.

Figure 1: Insta 360 sports camera



In the next step, the recorded images were processed by a 360-degree camera in Photoshop software. Elements such as the surface of shadows and brightness, light and color, and elements that were corrected. After that, unnecessary and additional elements were removed from the images by the same software. The output of this software was a suitable 360-degree image. In the next section, 3Dvista software was used to convert this 360-degree photo into a complete and visible image on various virtual reality-based devices.

Figure 2: Example of a 360-degree image recorded from the interior of the store



Figure 3: Example of a 360-degree image recorded from the interior of the store



Figure 4: Sample of 2D images (typical) recorded from the store environment



The researchers in this study provided the conditions for dear readers of this article to experience a small part of the created virtual reality tour in a limited way. For this reason, dear readers can visit one of the central locations of the tour if they have a virtual reality headset. For this purpose, they can use their virtual reality headset to enter the link in the footer¹ and experience a small part of the 360 virtual reality tour in this experiment. Additionally, readers who do not have a virtual reality headset can access a very limited part of the trial tour through Google Maps via their smartphone and enter this link². The Samsung Galaxy S8 smartphone was used to view the 360-degree content created based on augmented reality. This mobile phone, with a 5.8-inch Super AMOLED display and a pixel density of about 570 pixels per inch, makes the images display clearly and clearly. The HMD or virtual reality headset used in this research was VR Box 2. The headset has a 115-degree viewing angle and a lens diameter of 42mm, which, along with the Samsung S8 smartphone, provides an enjoyable experience of viewing virtual reality content for audiences.

Figure 5: VR Box 2 virtual reality headset



1

https://momento360.com/e/u/a30113d901474b459fd019122e9db110?utm_campaign=embed&utm_source=other&heading=374.42&pitch=-14.96&field-of-view=75&size=medium

2 <https://goo.gl/maps/myWxRscKmFvgTWnF6>

The created questionnaire consists of two parts. In the first part, the participant's personal information such as age, gender, and degree are measured and in the second part, the rate of intention to visit people is measured. In order to design questions related to the measurement of consumers' intention to visit physical stores, articles (Itani & Hollebeek, 2021), (Kim et al, 2021) and (Ying et al, 2021) were used. The validity of the questions in the questionnaire has been proved in the article; however, the questions in this section were presented to 5 professors and experts in the field of marketing, and its content validity was proved. Cronbach's alpha test was used to assess the reliability of the questionnaire. The results of Cronbach's alpha proved the reliability of the questionnaire (Cronbach's alpha = 0.896). The questionnaires were created based on Likert's 5-choice scale. The answers to this questionnaire could range from "I disagree completely" to "completely agree".

The method of the experiment was that the participants attended the desired location at a specified date and time. After that, the researchers spoke with them in a group for about 15 minutes so that in addition to creating inner peace and reducing stress in people, the method of experimentation was also explained to them. Then, the researchers randomly divided the participants into two groups of control and virtual reality (each group of 12). In the next step, both control and virtual reality groups were asked to observe 2D (normal) images of the store environment in 5 minutes. Then, participants were then asked to express their intention to visit the store using a questionnaire. In this way, the pre-test process was performed in both the control and virtual reality groups.

Figure 6: Virtual reality images of the store environment in the Vr Box2 headset from a person's point of view





In the next step, the virtual reality group was asked to view the store environment once again by wearing a VR Box 2 virtual reality headset, 360 degrees based on virtual reality technology. The resulting virtual reality images were clear and clear images, and during this process, there was no need to do anything special on behalf of the participants. After wearing a virtual reality headset, they could watch Kenney Boy's store environment at 360 degrees. By turning the head up-down, left-right, the smartphone's gyroscope sensor was stimulated and the viewing angle change process was done automatically. In this case, people saw the indoor area of the store as a first person – standing in the center, interactively using the rotation of their heads around. Meanwhile, no intervention was performed in the control group. After observing the store environment by all members of the virtual reality group, both the control and virtual reality groups were once again asked to express the intention of a physical visit to the store by questionnaire. At this stage, the required information for the post-test was measured.

In order to assess and measure the psychological maturity of the subjects over time, the test participants were called again to the selected location 4 weeks after the first stage and the test was performed at the level of recall or follow-up. The number of participants at this stage was not decreasing compared with the previous stages and all the participants of the first stage were present at this stage. At this stage, the experimental group was asked to put the virtual reality headset on their heads again and take part in the virtual tour, while the control group was also asked to view 2D images of the store environment for 5 minutes. After completing the activities of both the experimental and control groups, a questionnaire was given to them again to show their intention to visit in person. This procedure was performed to measure puberty error (changes in people's thoughts over time and the mental stability of participants) as a level of recall or follow-up.

Questionnaires were collected and analyzed by SPSS software version 26. In this study, in order to show the effect of virtual reality-based tours on the intention of the physical visit of the audience to the Kenny Boy store, statistical tests of mean comparison of each group, standard deviation, Kappa agreement test, Kolmogorov–Smirnov test, Levene's test, and dependent T-Test were used.

Findings

The results of this study can be expressed in two groups descriptive and inferential statistics. In descriptive statistics, 8 (33.3%) of the participants were female and 16 (66.7%) were

male. More than 70% (17) were under 40 years old and 29.2% (7) were over 40 years old. The mean age of the subjects in the experiment was 39.95 years with a standard deviation of 9.46. The main distribution of educational degrees was in master's degrees with 9 (37.5%) and bachelor's degrees with 8 (33.3%), Ph.D., and associate degrees with 5 (20.8%) and 2 (8.3%) respectively.

Table 1: Descriptive statistics of participants in this research

		Number	Percent	Average	standard deviation
Gender	Female	8	33.3	34.95	9.46
	Man	16	66.7		
Age	Up to 40 years	17	70.8	34.95	9.46
	Over 40 years old	7	29.2		
Education	Associate degree and less	2	8.3	34.95	9.46
	Bachelor Degree	8	33.3		
	Master Degree	9	37.5		
	PhD degree	5	20.8		

To evaluate the content validity of the complete set of experiments, including test design, test performance, measuring devices, existing virtual tours, quality and validity of existing images, intermediary programs and hardware used, the viewpoints and knowledge of 5 experts in the field of virtual reality technology were used and based on their opinions, necessary changes and modifications were made. Kappa Cohen's agreement coefficient was used to investigate the level of coordination and integrity of the content validity presented in this study. For this purpose, the system designed by researchers was tested by several experts in this field and the result was a Kappa agreement coefficient of 0.821.

Also, previous researchers in their studies in the tourism industry have stated that the reliability of this tool in similar researches in that industry. Using the test-open test method means performing a preliminary test and recording the results, then performing the secondary test and finally calculating the correlation between the results of these two tests through the Pearson reliability coefficient, which is a measure in the range between R1=83% to R4=95%. In the next step, the Kolmogorov-Smirnov test was used to measure the normality of the distribution of the research data. The results of this test indicated a normal distribution in the research data, which is why parametric statistical tests were used in the next step ($p>0.05$).

Levene's statistical test was used to test the variance parity between the two groups. The results of this test indicate the parity of variance between the control and virtual reality groups (experimental group) ($p>0.05$). Due to the lack of differences between the means of the two groups in the pre-test stage, it can be said that the participants are in two groups of homogeneous control and experiment.

Throughout this study, we have tried to reduce the existing errors in order to increase the internal validity of the experimental design. By defining the exact characteristics necessary for the participants to enter this project, it can be stated that errors related to significant differences

between the participants are significantly reduced. Throughout the test, we have tried to use standard devices, virtual reality headsets, high-quality displays, and so on to reduce the error of measurement devices as much as possible and provide a uniform and similar experience at all stages to prove the reproducibility of this complex. Also, by precisely controlling the experimental stages and the variables affecting this test (as much as the researchers' power), it was tried to prevent the external effects of other independent variables as much as possible and increase the external validation of the complex.

In order to investigate the intention of visiting the physical store of Kenny Boy, after observing the 360-degree interactive virtual reality tour by the experimental group, the tests of mean comparison, standard deviation, and paired T-test were used. The data obtained for these tests were obtained through responses from both control and virtual reality (experimental) groups, which were obtained through a questionnaire completed by the participants, the results of which were briefly revealed in Table 2.

Table 2: Summary of results of comparison of mean and standard deviation in experimental and control groups in two stages of pre-test and post-test

		Pre-Test		Post-Test		Significance coefficient (0.05)	Mean difference	reminder (follow up) Test	
		Mean	standard deviation	Mean	standard deviation			Mean	standard deviation
Intention To Visit	control group	1.622	0.053	1.618	0.057	0.508	0.004	1.704	0.063
	Virtual reality group (experiment)	1.603	0.051	3.971	0.074	0.000	-2.368	3.827	0.070

As shown in Table 2, in the control group, the intention of a physical visit to the store, with an average value of 1.622 and a standard deviation of 0.053 obtained in the pre-test stage, with an average value of 1.618 and a standard deviation of 0.057 obtained in the post-test stage, indicates no significant difference in the mean and standard deviation values. Due to the lack of direct intervention (testing and testing of virtual reality headsets) in this group, their intention to visit the store has not changed.

On the other hand, in the pre-test stage, the mean and standard deviation of the control group as well as the experimental group with the values of 1.622 (0.053) and 1.603 (0.051) indicate a suitable balance in the behavioral intention of both groups before the experiment. The mean and standard deviation of the experimental group in the pre-test stage reached to 3.971 (0.074) with the values of 1.603 (0.051), respectively, indicating a significant difference.

This result answers the main question of the research and states that if you use 360-degree virtual tours based on virtual reality technology (interactively), it will increase the intention of viewers and audiences to visit the physical store in virtual reality content. By comparing the control and experimental groups in the post-test phase, it can be stated that the

effect of virtual tours on stimulating the intention of visiting is much higher than normal two-dimensional images (mean and standard deviations of 3.971 and 0.074 vs. 1.618 and 0.057).

After 4 weeks after the first phase of the experiment, the second stage under the title of recall (follow-up) in order to investigate the effect of psychological maturity on the results of this test showed that the intention of the control group to visit in the reminder stage (with the mean and standard deviation of 1.704 and 0.063) was a insignificant amount compared to pre-test and post-test stages (with a mean and standard deviation of 1.622 and 0.053 - 1.618 and 0.057, respectively) increased.

The mean difference between the recall stage and the pre-test and post-test stages (with the values of 0.082 and 0.094, respectively), which can be due to the participants' mental imagination about the test and its results during 4 weeks. On the other hand, in the experimental group, the intention of visiting the participants in the follow-up stage and after 4 weeks after the first stage of the experiment (with the mean and standard deviation of 3.827 and 0.070) compared to the post-test stage (with the mean and standard deviation of 3.971 and 0.074) decreased by a insignificant amount (the mean difference between follow-up and post-test 0.144), which can indicate environmental impacts and other independent variables. Affect the individual between the 4-week interval between the first and second stages of the test. Of course, it should be noted that this average difference is very low and unremarkable, so it does not question the results of the research. As can be seen in Table 2, there is still a significant mean difference between the pre-test stage and the follow-up stages in the experimental group (the mean difference of 2.224) so the intention of visiting the participants (experimental group) in this study is absolutely high after a 4-week interval between the first and second stages.

Discussion & Conclusions

Virtual reality technology or VR is one of the most promising technologies in the world that is discovered and introduced with a very high speed, new applications, and potential. Unfortunately, both abroad and in Iran, marketers and researchers of consumer behavior are unaware of this emerging phenomenon and do not pay enough attention to it. Most researches related to this technology have been conducted in the fields of tourism and medicine. However, with a brief overview of virtual reality capabilities, a bright and growing future can be imagined. Due to the significant growth of new technology and products, today virtual reality is not a luxury and costly commodity and can be accessed and used at very low costs. This will indicate an increase in the number of subscribers in the near future. For this reason, marketers are suggested to think about developing their platforms on a virtual reality platform and discover and use its various and increasing applications in the marketing, retail, consumer behavior, advertising, etc. industry.

This increases the competitive advantage of the company and retail, and by doing so, the brand differentiation rate has increased and its brand name can be positioned as a new brand. Another widely used application of virtual reality is its use in the study of consumer behavior and market research. As this research shows, virtual reality has the ability to transform traditional systems in the field of consumer behavior, retail, advertising, and market research. Through virtual reality, many products, market, consumers, etc. testing tests can be performed at a very low cost and high accuracy and create new horizons in the industry.

The results of this study first answer the main question of the research and state that the use of 360-degree virtual tours based on virtual reality (its interactive type – meaning the use of headsets placed on the head) will stimulate and directly increase the intention of its audience to visit the real store physically. For this reason, leading retailers and marketers are suggested to increase their knowledge of virtual reality and move toward more modern and global approaches instead of using traditional platforms and methods such as virtual social media pages. For example, by designing 360-degree virtual tours based on virtual reality and placing them on their websites, virtual pages, etc. To increase their communication with the audience in addition to engaging them with the store or company, (according to the results of the research) reduce the perceived risk of the audience and encourage and invite potential customers or even non-customers to physically visit the store. This will increase the value created for the audience as well as the brand equity of the collection.

Of course, the results of various studies mentioned in this article also some of them, stating that purchasing behaviors and consumers' behavioral reactions have changed due to COVID-19 and this has created a new paradigm in consumer behavior so that many people now prefer to shop from online stores and less to surf the store. Therefore, a marketer or store should not only pay attention to their physical environment but also create a digital-virtual environment along with paying attention to the existing physical environment. This new environment should be in the context of new and global platforms to reduce the time, place, and financial constraints of consumers to access this environment as much as possible. This factor has increased the visit to the store - physical - virtual, which will result in more profit for the company.

Comparison of the mean and standard deviation of the experimental group or virtual reality in the pre-test, post-test, and finally follow-up stages indicates a significant difference in the rate of the intention of people to visit the physical store due to the persuasion and trunking of people by 360-degree tours based on virtual reality. The results of this study are somewhat similar to the researches (Yang et al, 2021), (Itani & Hollebeek, 2021), (Baek et al, 2020), (Graphzhian et al, 2020), and (Moes & Vliet, 2017) and indicate the impact of virtual tours on people's visit intentions. On the other hand, the results of this study are in conflict with the results of the study conducted by (Adachi et al, 2020) on the lack of the effect of virtual reality on a visit intention.

Still, many companies and retailers globally have put their main focus on competing to improve and enhance their customers' experience and physical store traffic. The competition has become a full-fledged war. New collections can use the Blue Ocean strategy instead of engaging

in this costly war, which may have little chance of success. According to this strategy, it can be stated that instead of war and spending money and time in the competition between traditional stores, a new channel of virtual stores - virtual tours can be used and enter the abyss of the blue Pacific Ocean where very little competition is underway.

As mentioned in previous sections, the use of new channels, especially virtual reality, and 360-degree tours, in addition to creating many competitive advantages for the complex, improves the special value of the store brand and according to the results of this research, it will increase the incoming traffic in physical stores as these results showed that this technology has a very high ability to form The behavioral ode has an audience. Of course, merely creating new channels for leading companies is not enough and it is suggested that managers, over time with various investments on digital platforms, convert their stores from purely physical stores to physical-virtual hybrid stores and finally with sufficient knowledge and experience, to purely virtual stores. Certainly, the amount of financial flows in this case (due to the reduction of various operational and logistical costs) for the complex will increase to a very high degree.

Due to technological advances over recent years, the experience and use of virtual reality and 360-degree tours do not merely require expensive equipment. Currently, these new channels can only be accessed by smartphones that have Android or iOS operating systems, and the content provided such as virtual reality, augmented reality and 360-degree virtual tours can be viewed as easily as possible in any desired location. Reducing financial costs and facilitating the method and method of entering and using these new marketing channels will increase the exponentiality of the audience who use this technology. This factor makes it much easier, less expensive, faster and more accurate to measure consumer behaviors by marketers and marketing managers of various companies and organizations in the field of retail, advertising, shelving, décor design, placement, etc. The information received in this way is completely new, fresh, healthy and first-hand, which can contribute greatly to management decisions, both operationally and seniority.

Using the results of this research, retailers whose incoming traffic has decreased over time can provide and produce attractive and exciting virtual tours of their physical retail environment and deliver them on platforms where potential retail customers are present. Platforms such as website pages, social media pages, and in-app ads. Based on the results of this study, the result will increase and transfer the incoming traffic of the store from the digital channel of virtual reality to the physical store of that retail. On the other hand, retail owners who want major changes in the physical environment of their store, instead of spending a lot of money and time, can design and create a new environment in the form of 360-degree virtual reality-based tours so that in addition to reducing costs and reducing the risk of this activity, the results of changes can be easily measured from the perspective of the audience and customers using massive business failures (if unsuccessful) are prevented.

For retailers whose potential customers are reluctant to pay time or financial expenses for physically visiting retail, virtual tours are one of the most enjoyable communication channels

that can stimulate people to visit the physical store in person. It is also possible that many retailers may not be able to easily reach their international customers or customers who have long distances from the store. Through this channel, the desired collection can easily reach all its potential customers globally, interact with them and introduce and sell their products and services (selling online or by encouraging in-person visits). This connection is very attractive and enjoyable from the audience's perspective, which in addition to creating interest in the audience and creating value for them, will also improve the brand's special value.

Limitations and Future Researches

Like any other research, this research is not unrestricted and extensive time constraints, financial constraints and statistical population constraints (sample size) have affected the present study. Due to the prevalence of covid-19 pandemic, conducting in-depth interviews or increasing the sample size in this study is not possible, which will have an impact on it. Also, this study investigates one of the clothing stores, re-studying it in another category, another city, etc. This may increase the generalization power of the results of this study and during the investigation of its results, deeper and more applications for the use of virtual reality in the field of marketing/ advertising and consumer behavior may be formed. Due to the experimental method, it can be expected that a set of different independent factors and variables have been present during this study, which is out of the power of the researchers to control their impact on the subjects and participants.

It is suggested that future researchers improve the results of this research by conducting re-investigations in other industries and by expressing practical concepts about it, they are a guide for marketers and numerous collections. They can also examine their impact on purchase intentions or other important parameters in marketing, such as the impact on brand equity and sales, etc. In other ways, or the use of different types of virtual reality devices. By spending much more money and time, this research can be conducted in natural conditions and with a higher statistical population in order to measure people and consumers in normal and daily living conditions, and by comparing the results of this study, it can help to generalize and repeat the results of this study.

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