# IMMERSION OF AR-VR INTO TOURISM INDUSTRY

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## ABSTRACT

Virtual and Augmented Reality, in 21st century, is a technological gift that paves a new way for the researchers and Tourism Industry. In the COVID 19 era, where travellers will be extremely cautious in terms of future bookings as well as which destinations to select □ the closer they can be brought to the real experience the more inclined, they will be to make a decision, as well as an actual booking, for when lockdowns and social distancing restrictions have levelled out into a new normal and AR-VR turning out to be very crucial in the tourism and marketing scenario. The objective of this paper is to display the beneficiary aspects of indulging AR-VR into Tourism Arena to fight back the loss caused by COVID 19.

## 1. Introduction

The subject of this research is virtual reality and augmented reality, and their role in tourism marketing. The COVID-19 global pandemic has given a much-needed push to technology adoption around the world. Stuck because of long lockdowns, people are seeking new solutions to everyday needs, be it food deliveries, medical requirements or education. Crisis can sometimes be the key to the development of emerging technologies, and the current outbreak may become a springboard for the growth and popularization of Augmented and Virtual Reality (AR/VR), two technologies that have been underestimated and underutilized in the past [1].

VR is the technology that can depict any tourist location or attraction reproduced as 3D imagery, controlled by powerful computers creating a complete Virtual Environment (VE). On the other hand, AR provides additional information about something in the real world with information displayed in the virtual world like previewing and booking the hotel, accessing information while one navigates around one's destination, translate written, spoken signs or conversations, locating dining and entertainment options [2]. With COVID-19 ravaging the tourism and hospitality business, AR/VR can make users feel like they are really experiencing the computer-generated world they find themselves in. It offers a try-before-you-buy experience which will give people a taste for travel, leading to a revival in holidays [3].

## 2.    Objectives of this Research:

Through this research it has been tried to focus on the applications of AR-VR in tourism so in in coming future it can thrive by replacing the conventional ways and also, we will come discuss some significant drawbacks associated with in the process [4]. The paper starts with the analysis of the past trends of AR-VR which dominated their respective industries and we will try to co-relate how the same can be executed in tourism fields [5]. Then we will discuss the literature review of the topic followed by some of the models like virtual cocoon which are already in development to take the AR-VR procedure forward. Lastly, we will look for some challenges in this application and their remedies [6]. Whenever we think about AR-VR based destination industry, we come across a very simple yet powerful question - "Are the tourists familiar with the reach of AR-VR and can do they consider its implementation it in their future travel plans, or it will have some influence in their vacation planning? Can the Tourism marketers consider the powerful technology as their marketing strategy in the future - and if they are already doing it, do they find it as a value addition in their success?". We will try to find the answers in the following paper via analysing the examples and challenges relating to Virtual tourism alongside the future possibilities of AR&VR technology. The Grand View 2017 report predicts that the VR industry will reach a net worth of 692 billion by 2025 and the virtual technology is also pierce in educational and medical fields [7].

## 3.    AR-VR trends over past years:

Pokémon-Go is a recent gaming trend wit over 65 million users. It was developed and published by Niantic along with Pokémon organisation for mobile gaming consoles. The summary of the AR based game is to roam around the real world, which is virtually portrayed as a fantasy land and collect some monsters as game points. The app was even getting suggested by health organisation as it helps one to get from one's couch and walk and connect with other fellow players.

As far as the success of the app is concerned, it made $207 million on its debut month and ended up with a per-day revenue of nearly $200,000(April 2019). This AR-VR based innovation made $800 million as per 2018 reports. As far

as, the user statistics go 60% were in the age group of 18-34 and 43% of the users were female [8].

From the above statistics, we can easily say that the acceptance of AR-VR technology was well accepted by the society. This similar concept of AR can be used to view details of traveling while one practically cannot during a pandemic lockdown. During an event called "Visit Anaheim", a promotion of Disneyland(California) was carried out. Similarly, real life maps can be used and with AR details one can virtually roam around the tourist attractions.

Another such example was set by John Hench (2004), one of the designers of Disneyland who implemented concept of virtual reality travel as far as 40 years ago. Disney theme parks are well known for its realistic and breath-taking fantasy rides. They are designed to have static roller coasters, which thrills people more than real due to clever use of timely air bursts at time of collisions. The effects are claimed to be so persuasive that people tend to believe they travelled some 'Alien Space Tech'. Disneyland generated $20.3 billion as of 2018, which is their highest in past 10 years. VR glasses are already in market, if technology permits us to implement same thrill in other adventures and thrill of real life places for example the Seven Wonders Virtual experience could be like a click away from us [9].

Another successful AR based app was 'Sunseeker' providing a flat compass and a 3D solar view. The app found immense creativity in the photographic, cinematographic and architectural horizon. It was widely accepted by Android and IOS platform users with a 3+ rating in both. This concept can be reused in Virtual Tourism to create a more accurate environment and creating variations like dawn, sunrise, sunset and twilight. AR implemented browsers like 'ARGON4' and 'AR Browser SDK' were also delightfully implemented. ARGON4 allows any 3rd dimensional view in reality to be customised by AR. These concepts can again be used in case one is trying incorporate tourism details in them for example Smart watch or iPad [10]

From these past examples, we can it is safe to say that though VR is not the most popular in the tech arena but it has the potential strength to revive the drowning tourism marketing.

## 4. Literature Review:

Virtual and Augmented realities are perceived as the future foundation in the tech world. VR, on one side, has the ability to create a virtual environment and fulfil the travelling satisfaction of an individual by playing around his or her five senses.AR, on the other side, creates a link between the real and the virtual world by providing additional real-time information and variety of tourism related options for example real time popup on hotel booking details with a device camera scan. The goal of the literature review is to demonstrate the impact of VR and AR into the Tourism Industry.

AR-VR was started as early as 1962 with the concept of "Sensorama Simulator", virtual experience of driving a motorcycle. Since then it has been implemented in various other fields like Disneyland and other amusement means like 3D and 4D theaters [11]. Another such instance is the research on 'Immersive Cocoon by NAU. This device is a human sized dome claiming

which promises to display realistic and high quality virtual environment [12]. Another similar instance is the introduction of CAVE (Cave Automatic Virtual Environments). The CAVE system are small areas where using virtual mechanisms and projection tools an environment is created and humans can roam around this area by wearing VR glasses [13]. Year 2009 saw first AR smartphone, 'Tuscany+', an "interactive, real-time guide" – with objective to amplify the tourism experience. The most revolutionizing instance of the AR-VR in technology was witnessed in year 2016 with the introduction of Pokémon GO (2016), an open, mobile multi-player Virtual and Augmented reality based game. This game was based on the kids animated series Pokémon but it managed to get the attention of the adult gamers as well. The user collected rewards and points by catching these Pokémons which are distributed widely throughout the virtual environment which can only be accessed and seen via the device front camera. This new creative gaming concept earned Pokémon Go a commendable spot in gaming market.

In this age of Internet, even when an individual plans a tour, he or she consults the webpages and reviews of the destination [14]. This attitude of consumers has led to new opportunities in the business field to promote their industries online [15]. Predicting travelers' choice of information sources and information channels. Journal of Travel Research). Thus, the online presence of tourism is a must have for any destination marketing strategy. The growth of E-Tourism is so dynamic that the field demands a constant redefinition of itself and requires continuous synchronization with market and management [16]. Sight-seeing, quality food and entertainment are the three main pillars of any good trip. With the assistance of AR-VR technology some of them are covered at the ease of a mobile click [17]. Like one access the restaurant details, its booking and even surf around the menus with reviews. The augment reality based apps makes the tourist to understand the culture better by understanding and translating the local language thus enhancing the communication with the locals [18]. The technology also offers navigation settings which displays best possible routes and sight-seeing details which makes the tourism more convenient and interesting at the same time ensuring the safety of travelers [19]. In a conventional travel plan an individual books a hotel on either recommendation or online brochures but with the advent of AR one can virtually tour the entire hotel, including its rooms and promised services thus enabling them to make a more convenient decision for travel [20]. For example, some eco-friendly hotels often provide users with virtual tour of its green assets like rooftop gardens and herb purified environment to showcase their specialty to customers. The Casamadrona Mansion (United States), displays the implementation of this technology by using augmented brochure [21].

Tourism communal meetings are often held which uses AR to discuss on certain issues to be addressed. One of such instance is the approach used by Sweden during the planning of two roads that passed through cultural heritage areas [22]. In another example, we have seen the tourism pans being discussed over internet based services for example Italy uses a SL type Virtual

Environment hub to facilitate the tourists while they roam and communicate with locals [23].

VR-AR can serve both as a medium to manage and market the destination industry. Various authors have given stress on the inevitable benefits of VR-AR in the marketing and branding strategies [24], and it is also stated that view AR-VR introduction can revolutionize the outlook of entire tourist branding [25]. Many of the tourism products are confidential and normal tourists are unable to access them but with AR-VR they can get some descriptions and idea about same during pre-booking stages [26]. Research could progress on the ideas and concept of Wan et al. (2007), who proposed the usage of virtual brochures instead of papers which can give a stronger visualization of the tour at the same time pose as a branding strategy. This process also opens gate for researchers to study certain characteristics of tourists that directly influences on their perception about the travelling experience [27].

Although VR substitutes is perfect for preserving heritage and for virtual entertainment but one must consider that factor that how much will it be accepted. It is also said that majority of population are more enthusiastic for seeing reality than virtually. The abstract ideas resulted in more powerful visual as they show interpretations can act in persuading or manipulating manner [28]. Similarly, it was expressed that the reach that artistic interpretation could cover before it inhibits accurate history events and able to convince a virtual visitor about the deviation of historical moments from what he or she expected [29]. In fact, this situation is quite applicable for historical re-creations where only one particular time period will be projected which may cause discrepancies. Looking at the brighter side, VR substitutes provides consumers with lower costs, no journey hassles, enhanced safety, no language barriers, no weather tensions, and a worthy experience [30]. Also, it is mentioned that the perceived attributes of the product or the support of a relevant authority may contribute to a strongly perceived authenticity [31].

AR-VR solutions are a great way of introducing new generation to technology and establishing worthwhile and familiar experiences. On the other hand, the travel and tourism industry offers a set of solid business and branding models to rely on which is very important for Virtual Reality technology.

## 5. Research Methodology:

The objective of the research is to show the impact AR and VR in Tourism Industry, to tackle the loss encountered due to COVID 19. As per the recent studies of 'Accord Marketing' (a marketing agency), VR tourism is rated as the third most popular virtual activity just behind Virtual Museum and Virtual Gaming. Virtual tour of Hotel Room and Luxury Suites are already implemented successfully so adding VR with popping AR description becomes the inevitable next step. The reason to choose this as a subject is because of damage that the pandemic has already caused in 2020.The World Travel and Tourism Council already gave us a prediction of loss of approximate 50 million jobs related to this field globally. Tourism Industry accounts for 10% of global GDP so its revival is very important for the economic balance.

The Research will be descriptive by nature i.e. existence have already been seen. We will observe how this technology has succeeded in market in past few years. Here we will see the impact of some virtual reality applications that successfully dominated their respective market and how their core can be re-implemented in Tourism Marketing. We will discuss the impact of Pokémon-Go in gaming industry, ARGON4 in browsing industry and Sun-seeker in advance photography.

Then we will consider some potential models that can virtually setup a revival for the industry. For example, the 'Immersive Cocoon' model (2009) that is proposed by an international design collective NAU. This dome based to suit human measurements and covers most of the 360-degree view with motion sensors as per data inputs. We will also consider another model offered by UK which called 'Virtual Cocoon', headset that can generate all the realistic five senses experience in a E-Tourism.

## 5.1. Modern AR-VR Technologies for Tourism:

As the AR-VR technology evolved researchers tried to come up techniques that can make it more portable or in other words more reachable. Then brainstorming was done to figure out the manner in the entire experience can brought in form of gadgets. One of such kind of a model is "Immersive Cocoon" (2009). It is basically a dome which contains a 360-degree display with motion sensor technology. The project objective here, is to take our mind and body to the closest possible amusing reality, which is virtual at the same time.

The device operates by opening the entry and extending stairs guiding the entry path. Following the stairs, one enters the inner dome which surrounded by a 360-degree display screen. This inner room can be subjected to any types of customisation one desires depending on one's resources. The researchers predict that with effective implementation it can help in conducting global political meets or may be countryside view in a city. When we think a tourism perspective it can one person to as far as Hawaii beach while he is residing in New Delhi. This technology can serve as an ideal interface for viewing the ancient artefacts and museum from someone's home, which is quite relevant considering pandemic crisis year. We have already seen this concept being applied by 'Asymptote Architects', New York. They formed a NY Stock Exchange Virtual 3D floor for trading purposes. Mr. Hani Rashid, founder of the company, wanted museum's artefacts to be viewed online beyond a normal website image, more in a form of virtual environment. Their organisation came up with a project which proposes idea of a perfect hybrid of electronic and realistic physical environment. Though the current status of the project is on hold yet they realised the tremendous potential of the technology. AU hoped to complete its first prototype by 2009 and make it commercially effective in future where the initial targets would be public places.

Another recent such example is 'Virtual Cocoon' by British Academics. It is an immersive headset which combines HD graphics, audio, temperature, humidity, sprayed flavours that can be identified by mouth and texture

sensitivity. It also comes with separate gloves to provide tactile sensation. If these features were not enough additional eye ball movement detectors are also tried to be implemented [32]. The objective is to apply the electronic and computing devices into the light weight device to deliver educational, business and relevant contents in a more realistic manner [33]

## 6. Managerial Implications of the study:

With the entire globe in a stagnant condition, the destination marketing must find a way to revive its position and keep consumers interested despite their immobile conditions. Tourism sectors have already realised that the impact of virtual technology cannot be ignored if they wish continue satisfying the customer needs. With the outside world locked down, virtual world the arena for the brands to battle.

Some notable tourism brands have already shown interest for launching successful online campaigns to assure their consumers that they can still experience a destination right from their home. 'Airbnb' offers their consumers some virtual travel experiences which include tours, events and destination specific local activities around the globe. These activities can serve as a much-needed break from the home isolations. Thus, we can see how Airbnb used a marketing strategy to leave a mark in their consumer minds to get a completive advantage.

The Monaco Tourism Board introduced a new campaign called "MISS YOU". It is a communication campaign to remind every consumer about their precious memories related to that destination via messages and [pictures also offer a wide range of virtual tourism options to access the museums a, garden, opera performances for example the 'Monte Carlo Philharmonic Orchestra'.

Switzerland Tourism introduced the '#dreamnowtravellater' campaign that help one to plan tourism related events once the pandemic is over. They even launched a video displaying how their tourism awaits more traveller after the crisis period. Eye catching hashtags, videos, virtual tours are becoming their marketing strategy to target the consumers. Many tourism boards have also come up with e-learning campaigns to keep the members of the industry engaged and enhance their knowledge in the stagnant situation of the world.

In the COVID 19 crisis it is important to brands and related business to realise that they can't quit their consumer engagement even though the industry is not up and running like before. They must provide engaging campaigns and at home experiences to maintain the steady customer base so that the consumers feel they are given a special service. This is where AR-VR comes most into play to give them an experience which can make the brand image stronger. This is also a great time to introduce all the digital marketing tools like social media and virtual; campaigns to retain and build the organizations. The bigger organisations can partner up with the locals to provide new experiences to consumers globally. With a reliable source backing up prevents all the social media hoaxes to get viral and instead provide them with authentic experiences.

## 7. Conclusion and future research ideas:

Though the potential of AR-VR to revive the industry is tremendous but there are some challenges associated with it which are still needed to be tackled. Although the scopes cited in the paper can revolutionise the industry but still it highly depends on advancement and offering of future technologies. For example, we have High definition and High quality in our hands but the scope of photorealistic technology and ability to emulate three other human senses is still at a basic stage. A Virtual Environment in which all feel, taste and smell can be found is still at its rudimentary stage. Such limitations are highly challenging in case of implementation of successful virtual tourism. Another example is when VR landscape preferences for individual got tested it was found that due to lack of haptic feedback, the Virtual Environment accuracy decreased resulting in unrealistic walking motion. There is no doubt that with technological development this will be overcome but in present conditions it poses as a limitation. In another instance, it was found that VR data showed signs of decreasing efficiency than the traditional ones like books or pictures. VR formatted data as of now is found to become obsolete very quickly making is inaccessible. Without the proper pacing and review of the technology, the format can also result in motion sickness and headaches [34].

With the implementation of VR in tourism industry being at its infant stage, only a few researches have directly examined its application in the field. As this technology can be the biggest saviour of the industry in post pandemic days, much re-investigations must be performed. For instance, the behavioural study of customer about the technology now or after decades can give us some answers related to its success. Some of the topics and future aspects are discussed in this paper which also opens the door to more questions in near future. Another example can be study of consumer sentiment in areas which are lesser educated about the existence of AR-VR and also the sentiment analysis in a more demographic manner. Research can also be conducted regarding the use of Virtual brochures instead of traditional for more consumer clarity. Similarly, market researches can also be conducted to see the application of different VR devices like Immersive Cocoon, CAVE etc in the attraction sectors like museum, historical artifacts etc or to check the viability of successful 360-degree format VR in manmade attractions like Eiffel tower, Taj Mahal or Pyramid of Giza [35]. Research can also be conducted to analyse the educational benefit of Virtual exhibition over the traditional methods. Similarly, future researchers can also open a way for allowing disabled tourist to enjoy the beauty of tour with Virtual Environment. Another research can be to define the motivations and constraints of consumers for accepting a virtual based tourism [36].

From the points and models discussed in the paper we can say the scope of AR-VR based is vast and very important in a technological progress. Virtual environment can provide value addition to tourism industry especially considering its development status in COVID crisis. AR-VR is an emerging technology and just like two opposite sides of a coin, it has its fair shares of opportunities and limitations. Only with proper research and future advancements these limitations will be overcome. Even if we consider the

current status of this technology, it still offers the industry many forms of entertainments. It also gives us an opportunity to preserve our heritages in a virtual form in case of any odd situation. The development of AR-VR technologies will expand its way into Tourism as well as build hopes for more job opportunities and researches to enrich the field with success

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