

# The Augmented reality and virtual reality as a tool to create tourist experiences

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Pages: 87–96

**Abstract:** The research was based on augmented reality and virtual reality as a tool to create tourist experiences. Since it allows to develop a dynamic three-dimensional simulation in which the user feels in an artificial environment that he perceives as real depending on the stimuli to the sensory organs. The methodology used was an exploratory study of tourist information platforms in the field of innovation, such as Hosteltur, Segittur and Thinktur, it also has a descriptive approach of cases of articles related to the use of virtual reality and augmented reality. The research will be a tool for the application of virtual reality and augmented reality proposals in destinations that are probably saturated and diversifying the tourism offer in countries in the process of tourism development, and will provide solutions to audiences affected.

**Keywords:** virtual reality; augmented reality; tourist experiences; virtual environments.

## 1. Introduction

(Grevtsova, 2016) Mention (VICENT, 2013). That “Technology is favoring the design of experiences in relation to rethinking the city”. Technology awakens “Innovation, creativity, immersion, fascination, sensitivity, wonder, information, development, imagination, technology, interaction... They are all terms that precisely evoke and describe the concept of the virtual world” (Castañeda, Camargo, Londoño, 2018), (Pérez Martínez, 2011).

The Phenomenon of Virtual Reality (VR) and Augmented Reality (AR), is increasingly gaining momentum for the development of tourist destinations, as increasingly, the tourist is more demanding and seeks new experiences. Today’s tourist plans their trips more and more in advance and is eager to know where it will go, what the place is and what activities it can do. It is here that virtual reality plays a key role in meeting these needs and offering tourists who will visit a rural setting a pre-accommodation look, landscapes and important historical monuments. (Hosteltur, 2019)

“While virtual reality virtually transports the user to an unknown location, augmented reality provides context information,” explains Dirk Schart of Reflekt, which develops virtual and augmented reality applications. “Many times we look for information. Augmented reality takes it where it’s needed, directly to the environment.” In this case the user is not protected from the environment by glasses. In this case the user is not protected from the environment by glasses. Rather, you receive additional information in text and image on your own Smartphone or tablet. Thus the visitor sees not only the monument through the screen, but also information about its history, size and time of construction. (Dvojak, 2018)

“Virtual Reality is a dynamic three-dimensional simulation in which the user feels introduced into an artificial environment that perceives as real based on stimuli sensory organs (Vera Ocete, Ortega Carrillo, & Burgos Gonzales, 2003), (Mejía Rocha, 2015, pág. 38) Citation to (Moliner, 2009), (Barros-Bastidas, Turpo, 2020). “In the tourist context, the digital environment promotes direct communication between the tourist and the destination he intends to visit, giving the first of these the possibility of pre-recognizing and selecting not only a destination”. If not rather a myriad of tourist activities that take place in the territory.

Virtual and augmented reality is the second technological revolution that has led to the 3D perception of simulated environments that allow the user to move to dream worlds and enable him to travel through time to the past and the future. If imagination has no boundaries and the yearning to discover new scientific paradigms either, VR is the sensory tool that can perhaps more accurately allow Humanity to search, find and decipher the new keys that will lead it through the path of knowledge by responding to the anthropological questions that have always been asked, who are we? And where are we going? (Pérez Martínez, 2011). In this context it is essential to use these technological tools to create experiences that resemble reality and more than anything in a dynamic and playful way, to reach the observer with an educational message why is the need to preserve elements tangible and intangible cultural and natural heritage that is part of the tourism activity in a destination.

The use of virtual reality and augmented reality allows to solve the social problems that are developed every day because of accessibility for all in tourist destinations, since in certain places accessibility is limited to people with physical, mental, visual and hearing disabilities. According to the United Nations (UN), by 2050, 21% of the world’s population will be over 60 years old, approximately 2 billion people. Even with these figures, these potential tourists face numerous physical, communication and attitudinal barriers when travelling, which fracture the value chain of tourist experience and cause tourist destinations to be inaccessible. (ILAM, 2018). That is why it is important to develop innovative projects that go according to the development of these technologies that minimize the impact of exclusion to these groups that in one way or another indirectly is reflected exclusion.

It is important to emphasize that virtual reality and augmented reality as a tool to create experiences is vitally important as it brings the user closer to immersive and multisensory environments; developing senses such as touch, sight and ears. Giving as a possible solution to people who by different situations cannot directly make the visit to a tourist destination.

Augmented reality applications also help in the planning of the trip from home because digital information can complete the data of the travel catalogs. To do this, the corresponding augmented reality symbol is scanned with the app, and additional images and videos are shown below. “In a travel catalog a hotel is presented on half a page, but obviously there’s a lot more to tell,” Welbers says. In this way tourists receive a wider impression of the establishment. (Dvojak, 2018)

“Currently any destination that pretends to be competitive must continuously update all that information that may be of interest to the visitor”(Barros, Turpo, 2017), (Caro, Luque, & Sayas, 2015) and moreover, if these are underdeveloped destinations. These technologies can become tools that are the motivation to travel to a little-known or developing destination. But we should not fall into the mistake of believing that virtual vacations can replace the real vacation experience. It should be noted that the use of these tools of virtual reality and augmented reality must be the most accurate, since on the contrary, one of the main drawbacks found in augmented reality applications in tourism, is that they usually show users a very high number of points of interest. This makes it considerably difficult to select the desired piece of information, especially considering that in most cases the user is using a device with a small screen. This fact makes the potential benefits of augmented reality attenuated by the amount of information that the user has to discard (Leiva Olivencia & Guevara Plaza, 2012).

## 2. Method

An exploratory, descriptive and case study methodology was proposed for articles related to the use of virtual reality and augmented reality to create tourism experiences. The pages that were explored were Hosteltur, Segittur and Thinktur tourism information platforms in the field of innovation. Companies from the tourism subsectors that are developing this VR and RA technology, to create tourism experiences. Finally, for the collection of information, tokens should have been made containing the information relevant to future proposals in other territories with a vocation and sufficient tourist value to be developed.

## 3. Results

The bibliometric search for virtual reality research as a tool to create experiences for tourists, is of vital importance since generally the lack of innovative proposals based on virtual reality and augmented reality does not allow develop accessible and inclusive tourist destinations. These innovations aim to recreate similar proposals in different tourist destinations with vocation.

“What a destination sells and companies in the tourism sector are not just travel but expectations, experiences and even promises of memories before being consumed,” says Natalia, “intangibles, which, thanks to virtual reality, can now start live before arriving at the destination, achieving a greater connection with customers and achieving an impact never before seen” (TECNOHOTEL, 2017)

This section will provide examples of virtual reality and augmented reality that have already been carried out in other scenarios, so that the tourist offer such as being able to have access to tourist experiences to all kinds of audiences is diversified.

<b>Introduction</b>	<b>Imageen's goal, in addition to carrying out recreations of architectural monuments, is to "try to immerse the user in the lifestyle of the people who lived and lived in historical places such as Carthago Nova. (Hosteltur, 2018)</b>	
<b>Description</b>	<p>The system, developed by the Spanish company Imageen, works through mobile devices and virtual reality glasses, available on the museum's premises. In this way, visitors can visualize in three dimensions the architectural recreations dating back to the first century "and live an immersive experience in the old Carthago Nova". When viewing 3D recreation, the user can do it in several ways. One of them is through virtual reality glasses that the Museum makes available to users for a price of 10 euros included in the guided tours. They can also view the recreations through their personal Smartphones or tablets, by downloading the Imageen-Cartagena app, from the Apple Store or Google Play, for 2.5 euros. (Hosteltur, 2018)</p> <p>The technology company already has other similar projects in different Spanish cities of the Roman era, such as Tarragona or Merida, or medieval type, such as Espuga de Francolí. (Hosteltur, 2018)</p>	
<b>Details</b>	General Objective	Rebuild the historical heritage for the development of tourism
	Specific Objectives	<ul style="list-style-type: none"> <li>- Provide more real experiences of the past.</li> <li>- To create collective awareness in the preservation of cultural spaces.</li> <li>- Provide comfort to people with difficulty accessing physical spaces.</li> </ul>
	<a href="https://www.youtube.com/watch?time_continue=2&amp;t=0TM2OWgmEo8">https://www.youtube.com/watch?time_continue=2&amp;t=0TM2OWgmEo8</a>	

Table 1 – Virtual reconstruction of Cartagena's historical heritage

<b>Introduction</b>	<b>The Gran Canarian palms reinforces its tourist offer aimed at families with new technologies of simulated reality, which can be experienced in the Elder Museum of Science and Technology. (Hosteltur, 2019)</b>	
<b>Description</b>	<p>The museum has incorporated an extreme racing simulator, which brings to the public the sensations that can be experienced in a racing car, with three panoramic screens and a dynamic platform. In this way, the sensations of inertia that a real driver would experience, with speeds of 2G in the corners, are transferred. (Hosteltur, 2019)</p>	
<b>Details</b>	General Objective	- Create new experiences for the distraction of the car racing-loving public.
	Specific Objectives	<ul style="list-style-type: none"> <li>- Provide more real experiences at low costs</li> <li>- Promote spaces for the diversification of the tourist offer in museums.</li> </ul>

Table 2 – Museums incorporate extreme new technologies for the family audience

<b>Introduction</b>	<b>Las Palmas de Gran Canaria reinforces its tourist offer aimed at families with new technologies of simulated reality, which can be experienced in the Elder Museum of Science and Technology (Hosteltur, 2019)</b>	
<b>Description</b>	It features a robotic arm that allows users to experience drastic movement changes between one and five meters high, just as experimental fighter jet pilots. (Hosteltur, 2019)	
<b>Details</b>	General Objective	- Create new experiences for the distraction of the public.
	Specific Objectives	- Provide more real experiences at low costs - Promote spaces for the diversification of the tourist offer in museums.

Table 3 – Museums incorporate extreme new technologies for the family audience

<b>Introduction</b>	<b>FlixBus, Europe's largest long-distance road transport operator, has launched in collaboration with Inflight VR Europe's first virtual reality pilot program on long-distance buses, following the success of its US lines. The line with this product included part of Barcelona and has stops in Perpignan, Montpellier, Nimes and Lyon. (Hosteltur, 2019)</b>	
<b>Description</b>	Passengers can choose from 50 games and travel and movie experiences, such as touring the destinations on the FlixBus lines, relaxing with guided meditation, climbing Everest or swimming with whales in the Pacific Ocean. All are next-generation virtual reality content created by Inflight VR that can be viewed on the 15 Pico interactive devices on each bus. (Hosteltur, 2019)	
<b>Details</b>	General Objective	- Create new experiences for tourist distraction.
	Specific Objectives	- Put the technology at the service of customers. - Promote spaces for the diversification of the offer on buses. - Create experiences and enjoy the trip.
<a href="https://www.youtube.com/watch?time_continue=11&amp;v=s8M_nJSbdDI">https://www.youtube.com/watch?time_continue=11&amp;v=s8M_nJSbdDI</a>		

Elaboration: research group

Table 4 – Virtual reality on buses arrives in Europe on a route from Spain

<b>Introduction</b>	Caldea will have a virtual reality circuit on its premises, thanks to an agreement with the company Zero Latency. In this way, the thermal center of Andorra will offer packages that will combine access to the bathing areas with the enjoyment of this new immersive experience. (Hosteltur, 2019)
<b>Description</b>	"The action takes place in a real 300 square meter play area where up to eight players can move freely and see each other." This is possible thanks to special equipment and sensors located at different points in the room. The simulated weapons used in the game, dubbed 'Blackbird', have been manufactured using 3D printing. (Hosteltur, 2019)
<b>Details</b>	General Objective - Create new experiences for tourist distraction.
	Specific Objectives - Put the technology at the service of customers. - Promote spaces for the diversification of the tourist offer. - Create experiences and the enjoyment of the tourist.
<a href="https://www.youtube.com/watch?v=x22X-1f5G5w">https://www.youtube.com/watch?v=x22X-1f5G5w</a>	

Table 5 – Save the world of zombies: virtual reality comes to Andorra

<b>Introduction</b>	SK Telecom: The South Korean telecommunications company offers the possibility to visit shops, restaurants and hotels through virtual reality goggles. (Hosteltur, 2019)
<b>Description</b>	El museo ha incorporado un simulador de carreras extremas, que trae al público las sensaciones que se pueden experimentar en un coche de carreras, con tres pantallas panorámicas y una plataforma dinámica. De esta manera, se transfieren las sensaciones de inercia que experimentaría un conductor real, con velocidades de 2G en las curvas. (Hosteltur, 2019)
<b>Details</b>	General Objective - Create new expectations for tourist satisfaction.
	Specific Objectives - Create specialized products according to the tourist. - Create experiences and the enjoyment of the tourist.

Table 6 – SK Telecom

<b>Introduction</b>	Augmented reality in restaurants poses a number of creative solutions as a benefit. It is a way to approach consumers making attractive the different dishes they offer within their menu and facilitating the selection. (Díaz Aroca , 2018)
<b>Description</b>	Several chains are betting on investing in it and have seen favorable results. There is even an application called Foodpix, easy to install on your computer or mobile so that either you can check from your home or in the same restaurant that you have chosen to go to eat, what each dish looks like, validate the ingredients it contains and prevent it contains some allergen. And avoid unpleasant surprises when the dish arrives at your table. (Díaz Aroca , 2018)
<b>Details</b>	General Objective - Create new expectations for tourist satisfaction.
	Specific Objectives - Create specialized products according to the tourist. - Create experiences and the enjoyment of the tourist.
<a href="https://www.youtube.com/watch?time_continue=17&amp;v=R2XITvDnSM">https://www.youtube.com/watch?time_continue=17&amp;v=R2XITvDnSM</a>	

Table 7 – Augmented Reality in Restaurants

<b>Introduction</b>	<b>The Matterhorn, Matterhorn, Mont Cervin or Le Cervin or Hore or Horn mountain is arguably the most famous mountain in the Alps for its spectacular pyramid shape, often reproduced. Its summit, 4478 meters, is the fifth highest peak in the Alps. It is located on the border between Switzerland and Italy. (SWI, 2016).</b>
<b>Description</b>	One hand after another, one boot after another. Climbing a mountain requires patience, perseverance and experience. We take you to the top of Switzerland's most famous mountain without any training, no need to climb and even walk. Using your computer, tablet or mobile device, climb the Matterhorn via virtual reality (VR). You can enhance the experience through Google cardboard, Oculus Rift or other. (SWI, 2016).
<b>Details</b>	<b>General Objective</b> - Create new expectations in inaccessible destinations
	<b>Specific Objectives</b> - Diversify the tourist offer in inaccessible destinations. - Create experiences and the enjoyment of tourists.
	<a href="https://www.swissinfo.ch/media/ext/matterhorn_legend/index-spa.html">https://www.swissinfo.ch/media/ext/matterhorn_legend/index-spa.html</a>

Table 8 – Matterhorn: 360 degree virtual reality

#### 4. Discussion

“Moreno emphasized that virtual reality has a very wide journey in the tourism sector, beyond the promotion of destinations, services and tourist products. For Oscar Hormigos, from The App Date, virtual reality allows travel to impossible places and even allows time travel, so in that sense it can be a substitute for travel” (SÉGITUR, 2017). Since this involves subjecting the individual to a fantasy reality, which through the senses seen, touch and hearing perceives as if it were real. As in other tourist destinations have bet virtual reality and augmented reality for recreations of architectural monuments, it is like “trying to immerse the user in the lifestyle of people who lived and lived in historical places such as Carthago Nova. (Hosteltur, 2018). If it is well known that the (RV) and (RA) allows you to immerse yourself in the past, it can well be used in different territories and destinations to recreate cultural spaces that were destroyed at some point in history, with all those religious, cultural experiences, lifestyles that would be very difficult to develop without these technological innovations.

Las Palmas de Gran Canaria reinforces its tourist offer aimed at families with new technologies of simulated reality, which can be experienced in the Elder Museum of Science and Technology (Hosteltur, 2019) Museums are spaces dedicated to the conservation of tangible and material goods that need to rely on innovation and communication technologies and thus diversify the tourist offer and allow different types of audiences to be involved.

The tourist offer in relation to travel in transport, air, sea and land lend themselves so that through virtual reality and augmented reality, it allows the tourist or user to have activities that they carry out during the trip and thus create an experience pleasant as is the case with FlixBus, Europe's largest long-distance road transport operator, has launched in collaboration with Inflight VR Europe's first long-distance virtual reality pilot programme where passengers can choose from 50 games and experiences Travel and film making (Hosteltur, 2019)

Caldea will have a virtual reality circuit on its premises, thanks to an agreement with the company Zero Latency. In this way, the thermal center of Andorra will offer packages that will combine access to the bathing areas with the enjoyment of this new immersive experience. (Hosteltur, 2019), this type of virtual reality can be developed in different territories whether urban or rural, where the user is the protagonist of experiencing recreational activities in spaces developed with technological equipment.

Augmented reality in restaurants poses a number of creative solutions as an added value. It is a way to approach consumers making attractive the different dishes they offer within their menu and facilitating the selection. (Díaz Aroca, 2018), this type of activity makes it easier for different audiences to have a prior appreciation of the gastronomy that can offer a destination and thus take the proper precautions or in turn ask according to their needs.

We take you to the top of Switzerland's most famous mountain without any training, no need to climb and even walk. Using your computer, tablet or mobile device, climb the Matterhorn via virtual reality (VR). You can enhance the experience through Google cardboard, Oculus Rift or other Source: tools (SWI, 2016). Take as an example that no inaccessible destination can escape the development of experiences through virtual reality or augmented reality, since in many territories there are tourist attractions that by their access are difficult to access and the greatest ally to this kind of difficulty is virtual reality and augmented reality.

The user can preview through real images the different rooms offered by the hotel, giving the opportunity to walk through them, decorate them at the guest's will, and even book them (Hosteltur, 2019) This initiative allows different audiences with access limitations to visualize the ideal conditions for their rest and have a better experience when making use of the purchased service.

## 5. Conclusions

Virtual reality and augmented reality is a very useful tool to create experiences in destinations that are in the process of development and have a tourist vocation. Virtual reality and augmented reality allows you to recreate natural and cultural spaces that today have not been easy to recreate physically but in virtual form. Resulting in a more diversified offer aimed at different audiences. As stated (Sussmann & Vanhegan, 2000) "The tourism industry has to adapt to changing styles, but technology is progressing at high speed and political instability can force consumers to make new decisions".

"Augmented Reality helps improve the user experience, closing the gap between digital content and the real world" (Panou, Ragia, Dimelli, & Mania, 2018) Which allows inaccessible destinations and different audiences to have a much more playful approach.

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