

# Exploring Virtual Reality as an Innovative Tool for the Historical and Cultural Routes of Bogotá: Potentialities and Challenges

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## Abstract

By applying virtual reality as a technological tool for tourism, it has allowed the creation of new tourist experiences that raise the status and level of a city's tourist attractions. Examples in several cities around the world, especially those that are Intelligent Traitic Destination (DTI) and with a high degree of history, have allowed the use of virtual reality to be appreciated and highly qualified by tourists. Therefore, being Bogotá a city with the DTI seal and with a strong historical and cultural potential among its tourist attractions, interviews were conducted with experts in tourism, technological and historical issues in order to demonstrate the potentials and challenges that the application of virtual reality would have in different tourist routes of the city. After analyzing the answers given, it is concluded that 3 fundamental aspects must be taken into account for the successful and correct implementation of technology in the city of Bogotá: The adequate selection and striking representation of the historical facts to be shown, the investment, training and continuous updating of the technological equipment and the close joint work of all the actors involved derived from different interdisciplinary approaches.

## Keywords

Virtual reality, Potentialities and challenges, historical and cultural routes, Tourism Bogota

## 1. Introduction

### 1.1. An Approach to Virtual Reality

When making a first approach to the term "Virtual Reality", it is necessary to return to the 1950s. It was with the creation of the Sensorama device, a device that managed to reproduce environments in 3D and in turn simulated odors and generated vibrations while the user was sitting inside it, that a technology that has come a much more immersive advance today. As such, virtual reality is the possibility of generating by means of computer or computer technology scenes and objects of very real appearance and give the user the experience of being immersed in it. To give it that feeling of immersion, devices such as helmets or virtual reality glasses are used which allows the user to feel transferred to another space, in quotes, "physical and real"(Jones & Dawkins, 2017) (Halarnkar et al., 2012).

Bearing in mind this definition, it is necessary in turn to be clear about the difference between Virtual Reality and Augmented Reality, since, despite being two similar concepts, the uses and applications of each of them in different contexts is totally different. While Virtual Reality is responsible for creating and generating new spaces and environments which are built artificially, augmented reality has support in the real world and places artificial objects or images on it. Figure 1 shows more clearly the main differences between these 2 types of realities. However, it does not mean that both technologies cannot merge, since experiences have been created with greater immersion and improving their quality in this way.(Altomari & Gustavo, 2017).

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**Figure 1.** Differences between augmented reality and virtual reality. Source: <https://iat.es/tecnologias/realidad-aumentada/diferencias-realidad-virtual/>

So strong has been the rise of these technologies that one of the most relevant examples is the one that Mark Zuckerberg, owner of and founder of Meta (company that associates the main social networks such as WhatsApp, Facebook and Instagram), wants to create. He aims to create a Metaverse, a post-reality universe, a perpetual and persistent multi-user environment that fuses physical reality with digital virtuality. Zuckerberg's goal is to generate a totally virtual space where users, in addition to interacting in different spaces such as games or meetings, can lead a second life within it. This will be achieved with the purchase of objectives such as real estate, cars, clothing, among other objects that are only for use in the Metaverse.(Espinoza, 2022).

## 1.2 The application of virtual reality in different industries and tourism

However, the use of virtual reality is not only intended for entertainment. Thanks to it, new possibilities have been optimized or generated in different industries, which see in it an effective tool to achieve their current and new objectives. Table 1 shows just a few cases of how different industries have taken advantage of this technology.(Bohorquez, 2018)

**Table 1**  
**Examples of the use of virtual reality in different industries**

Industry	Virtual reality usage
Medicine	<ol style="list-style-type: none"> <li>1. Simulation of surgeries for medical students</li> <li>2. Therapies and treatments focused on reducing the effects of Parkinson's and Alzheimer's</li> <li>3. Treatment of Phobias and Psychological Damage</li> </ol>
	<ol style="list-style-type: none"> <li>1. Training soldiers in new weapons through virtual reality</li> </ol>

Military, police and firefighters	<ol style="list-style-type: none"> <li>2. Simulation of combat zones for training</li> <li>3. Simulation of vehicle handling in extreme cases</li> <li>4. Simulation of crime scenes, fires for training</li> </ol>
Architecture and Construction	<ol style="list-style-type: none"> <li>1. Creation of construction plans and evidence effects on the changes that can be made.</li> <li>2. Simulation of spaces to see the use and effect of distinctive types of materials in the final product.</li> <li>3. Management of simulation of high impact works to see the damages and environmental effect.</li> </ol>
Industry	<ol style="list-style-type: none"> <li>1. People with disabilities can perform tasks such as moving machinery or objects through remote control.</li> <li>2. Digital prototyping of products for verification before construction.</li> <li>3. Safety training and handling of hazardous materials.</li> </ol>

Source: Own elaboration obtained from different articles on applicability of virtual reality

No stranger to this phenomenon, tourism has also been one of those industries that has benefited from virtual reality and this has been reflected in the experience that can be given to the tourist in the destination and / or tourist attraction. Although the tourist does not have as main motivator the use of virtual reality when carrying out tourist activities, the use of it has generated that the different providers of tourist services manage to create a more immersive and memorable experience for their customers.(Almeida, 2019)

An example of the use of virtual reality for the creation of sightseeing tours is reality by the company VRGuide.me based in Prague, Czech Republic. Taking advantage of the wide and rich history of the city, this company has designed different tourist routes where for an average price of 27 Euros, they will be given a 2-hour experience which includes professional guide service and virtual reality glasses where they will be shown through recreations of the area where they are, how the city lived historical moments such as the Nazi occupation in World War II, the development of medieval times, the constructions of main buildings and attractions such as the Charles Bridge, among other relevant events of the capital.(VRguide.me, 2023)

The company has been so successful that it has already started the process of selling franchises and has already made this same type of tours in cities such as Malaga in Spain and is in the expansion phase towards Latin America. According to Marco Antonio Lueg, CEO of the company, one of the advantages of this type of service is that, although it seems to be repeated, it is not. Since each story that can be told is different according to the country, city, culture and even context changes, resulting in each tour being unique and unrepeatabe (Lueg. 2023).

Bearing in mind the above and other studies on applications of virtual reality to tourism, the historical and cultural importance of the destination or tourist attraction plays an important role in the use and success of the tool. Since the more situations that can be represented in virtual reality and that are sufficiently striking for the tourist, the experience and satisfaction of the same in front of the use of the tool, as in front of the destination, will surely be much better (Wei et al., 2023).

In turn, the technological component of carrying out this type of tour, supports the nomination of cities as Smart Tourist Destinations (DTI). Where one of the 5 aspects to keep in mind is the use of technology for the tourist enjoyment of cities, generating facilities and experiences for tourists and even their own inhabitants (Jasrotia & Gangotia, 2018).

With these details in mind, when looking for a city in Colombia that has the DTI seal (obtained in 2021) and has a strong cultural historical component that allows the creation of virtual reality spaces to be considered as an important plus in its tourist offer, the city of Bogotá is a candidate with the necessary characteristics to be able to use this type of tools.

Therefore, the objective of this article is to determine what could be the challenges and potentials that could be presented for the application of virtual reality in different tourist routes of the city and in this way to be able to give a guide for its correct and successful implementation by different tourism actors, whether public and private.

## 2. Methodology

The methodology applied for the development of this article is a qualitative methodology. Since semi-structured interviews were conducted with different experts in tourism, technology and cultural historical issues of the city of Bogotá. The objective of developing these interviews with different actors is to know the different points of view on what these challenges and potentialities of the city could become in the face of the creation of these tourist routes with the use of virtual reality.

The idea of achieving these points of view, is to get to keep in mind what are the points in common or that each of the actors thinks that, from their field of expertise, should be taken into account when generating the routes. At the same time, professionals are chosen in these 3 fields since the objective is to generate routes that meet all the necessary characteristics to generate an experience that meets the expectations of the tourist, with good technology and that the historical facts are well narrated and documented.

At the same time, by conducting the interviews in a semi-structured way, it is sought to be able to have a guideline raised in order to have a guide that allows to talk to all the experts at the same level. However, being a semi-structured interview allows you to delve into different topics where the expert has more experience or opinions, which will help to give greater depth to what is wanted from these routes and the use of virtual reality. Table 2 shows the experts to whom the interview was conducted and their respective fields of expertise and company or workplace.

**Table 2**  
**Experts interviewed on history, tourism and virtual reality**

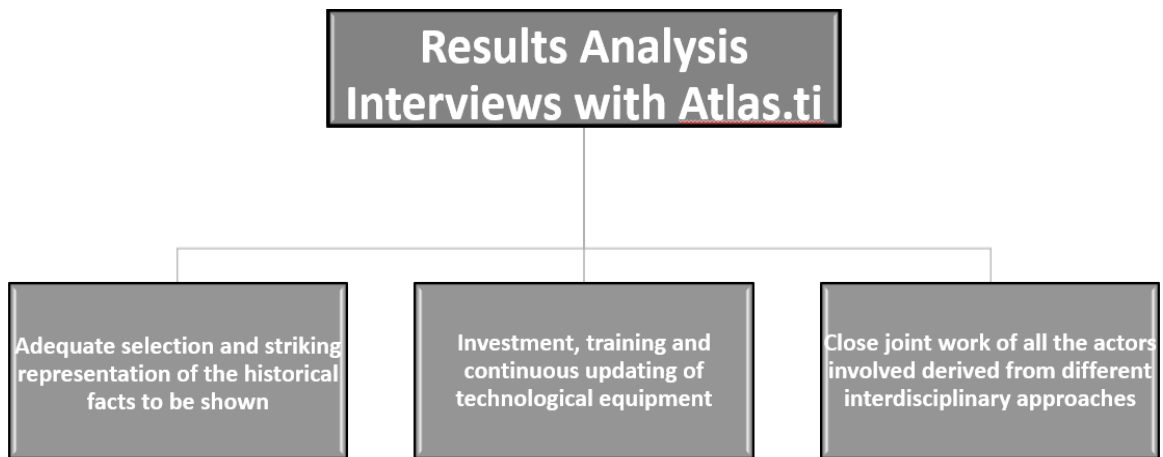
<b>Expert</b>	<b>Professional Field or Experience</b>
Professor Diego Alejandro Giménez	Historian and research professor at the National University of Colombia.
Doctor Ricardo Varela	Doctor in Society and Culture from the University of Barcelona and expert in tourism issues and CEO of the company Fundaculta.
Marco Antonio Lueg	CEO of Virtual reality tour company VRguide.me
Andrés Clavijo Rangel	Director of the District Institute of Tourism of Bogotá

Source: Authors.

Finally, for the analysis of each of the interviews and to find the points in common and of greater importance of the same, the software Atlas.ti was used. In this way, all the answers of each of the interviewees were collected in a more precise way for analysis.

### 3. Analysis of Results

After analyzing the interviews with Atlas.Ti Tools, the following points in common were identified, on what would be the challenges and potentialities that must be present in the city of Bogotá to apply virtual reality as a tourist offer of the city.



**Figure 2.** Results interviews Atlas.Ti. Source: Authors.

#### 3.1 Adequate selection and striking representation of the historical facts to be shown

According to the experts interviewed, Bogotá has an important portfolio of historical facts that deserve to be part of the tour. However, this technology lends itself to publicize the facts with greater relevance and that allow to create and generate adequate design and sufficiently striking mind that takes the most benefit from all the technology of the design of the stage and the technological equipment.

Therefore, the facts that decide to be designed in virtual reality format have to be focused on 2 factors: That they show a main fact in the cultural historical development of the city and that in turn are striking enough to generate the interest of seeing them in virtual reality. According to them, the experts came together in several facts that would be worth showing on the tour:

- Foundation process by Gonzalo Jiménez de Quesada and colonial era
- Urban and transport change of the city center from its foundation to the time.
- The vase of Llorente and beginning of the revolt of July 20, 1810.
- Death of Jorge Eliecer Gaitán and demonstrations of "El Bogotazo" on April 9, 1948.
- Capture of the Palace of Justice in 1985 by armed group M-19.
- Construction phase and consolidation of the Sanctuary of Monserrate.

Adding to the selection of places, experts emphasize that after selecting them, a route and tourist script must be generated that allows tourists to understand the importance of these events for the local, regional and national context. In this way, when the representation of the facts is made in virtual reality, its impact and symbolism will be much greater and will not only remain in the graphic representation that is made of it.

### **3.2 Investment, training and continuous updating of technological equipment**

For the success of tourist tours using virtual reality technology, one of the primary facts is the use of high-level technology that allows a continuous evolution of the experience over time. This is stated by all experts, especially the technological expert, where an experience of this style can not be seen at any time obsolete or routine in front of the user.

According to the interviews, the private company or government entity that is willing to carry out this type of tourist activity must be willing to have a significant outlay of money. This with the aim of generating a quality route that can become a new product of tourist interest for the city. For the creation of these virtual scenarios, keeping in mind a high quality, it may be necessary the minimum investment of 7,000 USD where only a historical event as such of approximately 4 to 5 minutes would be involved. A money that would be higher taking into account the historical facts that want to be made known and the continuous updating of them given the case

Adding to this value, virtual reality equipment must be added. According to the CEO of VRguide.me, the high-end team may have the ability to adapt to changing virtual reality technology as it progresses. In addition to this, each equipment must have maintenance and insurance in case of damage or theft. On average, high-quality equipment could cost between 2,000 to 3,000 USD by 2023.

Finally, a training of the personnel who will be in charge of the tour in the use of the same must be carried out to meet the objectives set for it. For this, the tour guide must be attentive to new changes and advances in technology so that these are applied to the script and tourist route. Generating that the route remains updated and striking for tourists who use them.

### **3.3 Close joint work of all the actors involved derived from different interdisciplinary approaches.**

Finally, all the interviewees conclude that despite having relevant historical facts and a high technological level for the development of the route, it is essential that for the creation of the same there is an articulated work between all the actors. Only in this way can a route be generated that meets the expectations of the people who use it.

When referring to the articulated work, a special focus is made on the fact that the route is not only created by the technological part (virtual reality scenarios) and the tourist part (tourist guides). For the route to be considered of importance among the portfolio of attractions of the city, different actors must be taken into account to support and nurture its creation from different approaches.

According to the interviewees, it is necessary to have the support of historians and cultural experts to support the creation of scenarios and routes. Since these will support that there is a greater historical relevance and virtual representations are as close to reality as possible. Another example is the support of the public sector through the promotion of the route as a new tourist attraction of interest and possibility of logistical support and security during the development of the same, since in this way the tourist will not feel worried about moving around the city with such economically expensive equipment.

An important feature found in the interviews was the interest of the interviewees in involving the local community in the process. Although the main attraction is the representations in virtual reality, achieving a joint work with the local community, where the route is made, can support and improve the experience of it. Examples such as the representations showing dishes or foods that can be found in local establishments could be one of the ways in which we manage to integrate the community into the route and experience.

## 4. Conclusion

The city of Bogotá has the necessary characteristics to be a destination where virtual reality can be applied successfully thanks to its cultural and historical wealth. That is something that both academic references and the experts interviewed for this article share and define as safe for a new innovative tourism product in the city. However, it is necessary to keep in mind the results obtained during the development of the article so that virtual reality does not pass as a mere and simple tool in the tourist process of the city.

Therefore, only if it is possible to create a tourist route that uses virtual reality as a fundamental axis where the appropriate selection and striking representation of the historical facts to be shown is taken into account; The investment, training and continuous updating of virtual reality equipment and it is possible to generate close joint work of all the actors involved in the tourism value chain (derived from different interdisciplinary approaches) will be able to have a robust and striking tourism product for tourists and locals both nationally and internationally that does not lose interest over time.

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