Mansoura University
Faculty of Tourism and Hotels

Emerging Technology Trends in Tour Guiding: Virtual and Distance Tour Guiding

By

Amal Aboelmagd
Ph.D. of Tourism Guidance
Faculty of Tourism and Hotels
Mansoura University

إتجاهات تكنولوجية صاعدة في مجال الإرشاد السياحي: الإرشاد السياحي الإفتراضي والإرشاد السياحي عن بُعد

مستخلص

تهدف هذه الدراسة إلى تسليط الضوء على أبرز الإتجاهات التكنولوجية الصاعدة مستقبلاً في مجال الإرشاد السياحي، مع التركيز على الإرشاد السياحي الإفتراضي والإرشاد السياحي عن بعد كنماذج. تعمل التقنيات التكنولوجية الحديثة على إعادة تشكيل مستقبل مهنة المرشد السياحي على مستوى العالم. تم تعريف الإرشاد السياحي الإفتراضي، والإرشاد السياحي عن بعد بوضوح في الدراسة. كما تم تقديم العديد من الأمثلة التي توضح كيف تعمل التقنيات الناشئة مثل الواقع الممتد بكافة اشكاله (XR) على إعادة تشكيل تجربة السائح كنتيجة للإنتشار العالمي لوباء فيروس كورونا (كوفيد –19) في السنوات الأخير. أحد أبرز أشكال المرشد السياحي الإفتراضي هي المرشد السياحي بواسطة تقنيات الواقع المعزز والواقع المختلط و الواقع الإفتراضي بالكامل، بالاضافة للمرشد السياحي الهولوجرمي والمستشار السياحي المكاني في عالم الميتافيرس الإفتراضي. ساهمت جائحة كورونا في خلق إتجاه ونمط جديد للإرشاد السياحي أيضا الا وهو المرشد السياحي عن بُعد، الذي تتنوع أساليب وأدوات عمله بين العمل في المزار السياحي عن بعد أو العمل كمرشد سياحي متنقل في مزارات سياحية متعددة. إستخدمت الدراسة المنهج الوصفي التحليلي منهجاً للدراسة.

الكلمــات المفتاحيــة: تكنولوجيا الإرشـاد السـياحي؛ السـياحة الإفتراضـية؛ الميتافيرس؛ المرشد السياحي الإفتراضي؛ الإرشاد السياحي عن بعد.

Introduction

The profession of a tour guide is one of the oldest professions known to humanity (Corfu, 2022; Khalil, 2021; Khattab, Omran, & Essa, 2018), despite the fact that its designations have changed over time and historical records regularly allude to its presence. The development of society and the raising of living conditions are linked to the organized profession of tourist guide, which has a very recent history. Due to the global economy after the world wars, more people had free time and holidays(Cohen, 1985).

Recently, all traditional travel procedures including on-site activities have been fundamentally revolutionized by the use of technology. For instance, traditional travel firms have begun to provide their clients with entirely online services. Online travel agents' (OTAs) existence and distribution increased as a result (Costin & Eslava, 2021).

According to Hefner (2021) and, during the second decade of the twenty-first century, virtual technologies were among the most widely used new technologies in the tourism sector generally and in on-site visitors' experiences in particular. Their impact and visibilty had significantly grown concurrently with the ongoing Corona epidemic (Covid-19), which in turn had an impact on visitors' experiences on-site. Therefore, we completley agree with Carvalho that **"**This is the right time to study these digital issues, taking into account that recently, due to the health crisis of COVID-19, people have had to rapidly adapt to other, never expected forms of life. The

new technologies in their different formats now play a key role, and it is expected that these technologies will be increasingly implemented in the future**"**(Carvalho, 2021). As aresutl for this fast grwoing technological interact, virtual technologies and remote guiding techniques are seen as being prominent future trends in the tour guiding profession (Farrag, 2021).

Since the market for 3D glasses grew in the second decade of the twenty-first century, virtual tour guides are predicted to play an important part in the development of virtual reality. More importantly, the generation of a variety of approaches and patterns that, when applied, fundamentally and immediately alter the visitor's experience at tourist destinations, is one of virtual reality's most notable uses in the tourism sector. Virtual tourism is a new subset of tourism that has emerged as a result of the richness of this technology's virtual contents (Nafees, 2016; 2022, الشرنوبي & ,عبدالفتاح ,أبوالمجد).

Above all, the development of those new technologies and their emergence have also influenced how tour guides will perform in the future. Virtual applications in tour-guiding result in the replacement of antiquated concepts with new and innovative ones. Today's tourists do more than just stop by popular destinations. Instead, they spend money on experiences and sentiments. The needs of the general public and visitors are closely considered in projects for virtual reality travel guides. The slogan for VR tour providers in the future will be to assert their locations as ones where "edutainment" may be more effective. (Invisiblecities.it, 2023)

1. Virtual Technologies (Statistics and Numbers).

Statistics may help us understand the effect and impact of virtual technologies on increasing or decreasing the demand for online virtual tours. In mid-March 2020, Google searches for "virtual tours" term increased by more than 400%, and they continued to rise noticeably until the end of the year. The numbers kept rising compared to the period prior to the pandemic, thus even after the coronavirus crisis was resolved and tourist sites resumed operation while taking all necessary precautions, the situation did not remain as it had been. Perhaps, this demonstrates how innovative tourist guidance on virtual tours has evolved from being something that was only needed during emergencies to being seen as a new tourist culture.
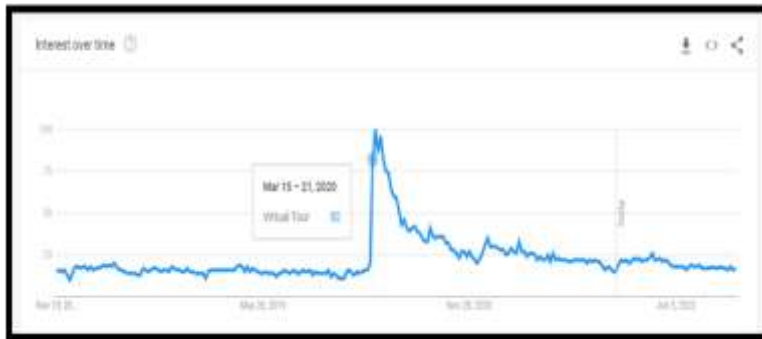

Fig .1. Google statistics about virtual tour search results 2018- 2023
(Google-Trends, n.d)

In addition, according to statistics and particularly in pandemic time and after, visitors from Canada are the top

country in the world for those looking for virtual tours online, followed by United States in second place, United Kingdom in third place, Singaporean visitors in fourth place, and visitors from Ireland in fifth. Due to the limited availability of virtual content on the Internet and the difficulty of absorbing it from a distance due to language barriers, it is also possible to explain why tourists from the last three countries (Russia, Turkey, and Japan) did not search for the virtual contents of tourist attractions. The aforementioned shows that tourists in Western nations have a greater ability and aspiration to use virtual guided tours than people in Central Europe and the Middle East.

Fig .2. Google statistics about virtual tour search ranked by country
(Google-Trends, n.d)

According to Buss & Bohnhoff (2020) poll, 49% of future tourists are interested in using virtual reality technology, but only if it is provided free of charge and does not increase the cost of their vacation. While 38% of them have no interest in using them, while 13% intend to use virtual reality technology throughout their upcoming trip experiences, even if those services are paid and not free. Environmental problems are usually brought on by

excessive visitor traffic in well-known tourist destinations. By restricting the number of individuals who engage in VR experiences of these locations, the environmental impact can be lessened.
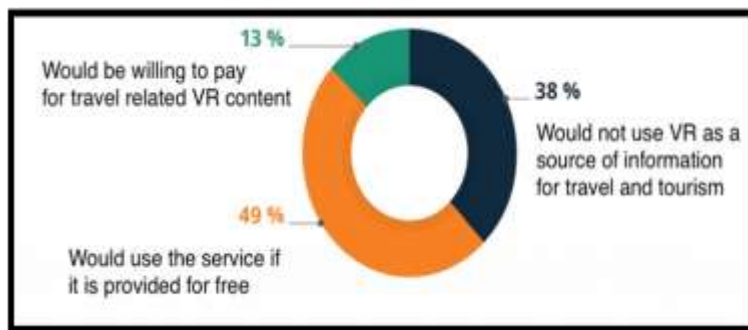
Fig .3. Statistics and Rates of Tourist demand for virtual reality applications in tourist attractions (**Buss & Bohnhoff, 2020)**

It's also crucial to mention that the impact of virtual reality technology on the tour guide industry has risen dramatically in tandem with the ongoing Corona epidemic (Covid-19), at a time when technology for remote work and virtual reality tours started to gain popularity and recognition.

2. The History of Virtual Technologies in Tourist Guiding

Augmented reality (AR), virtual reality (VR), and mixed reality (MR) are collectively referred to as extended reality (XR). With the use of technology, a "digital twin world" that can interact with the physical world is designed to blend with or mirror it. The

occupation of a tour guide, according to this theory, is connected to the technologies that started to move the professions that people traditionally performed directly to new and modern ways in which they can conduct these tasks electronically and in other ways.
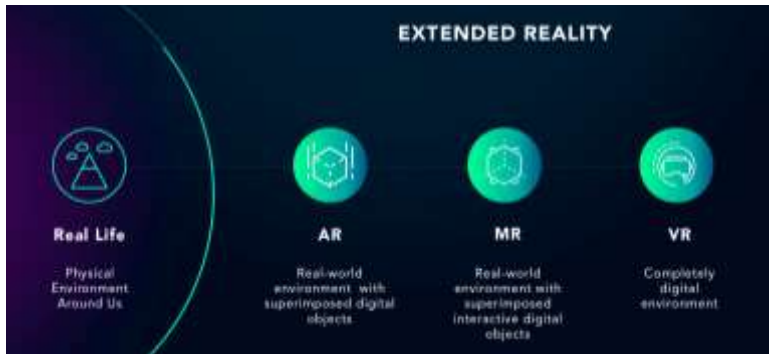

Fig .4. Extended Reality Types Infographic (Softengi.com, 2023)

Going back to 1960, Morton Heilig introduced virtual reality technologies for the first time (Hefner, 2021; Heilig, 1955). A few years later, in 1966, Ivan Edward Sutherland and his research group at the Massachusetts Institute of Technology (MIT) created the first interactive map of the American city of Asper, which featured a device with a TV screen that displayed the city's streets and allowed users to choose their direction of travel and manage directions using touch-screen technology. Without virtual reality technologies, this would not have been possible in locations where it is challenging to be physically present(Hosch, 2023).

In 1994, a museum visitor interpretation offered an interactive virtual "walk-through" of a 3D reproduction of

Dudley Castle in England as it appeared in 1550, marking the debut of virtual reality in a museum or archaeological application. A computer-controlled laser-disc-based device created by British engineer Colin Johnson served as the presentation's centerpiece (Norman, 2020). One of the first users of the Virtual Heritage production was Queen Elizabeth II when she formally launched the visitor center in June 1994. The system was showcased at a conference hosted by the British Museum in November 1994. The system was called "Virtual Tour," which is a combination of Virtual Reality and Royal Tour, because the Queen's officials had required titles, descriptions, and directions for all activities (Higgins, Main, & Lang, 1996).

Virtual tour guides are anticipated to play a significant role in the future of virtual reality as a result of the growth in the 3D glasses market that happened in the second decade of the twenty-first century. One of the most prominent applications of virtual reality in the tourism industry is that it generates a number of techniques and patterns that, when used, fundamentally and directly affect the visitor's experience at tourist attractions. This technology has advanced to the point where the richness of its virtual content has given rise to a new category of tourism known as virtual tourism(Nafees, 2016). Moreover, the current increase in calls for sustainability, virtual reality technology can be seen as a key alternative for the preservation and sustainability of monuments. Particularly for those tourist destinations that are harmed by a large number of visitors and the long-term repercussions of their careless and inadvertent use(Marzouk, Maher, & Mahrous, 2021). Referring to
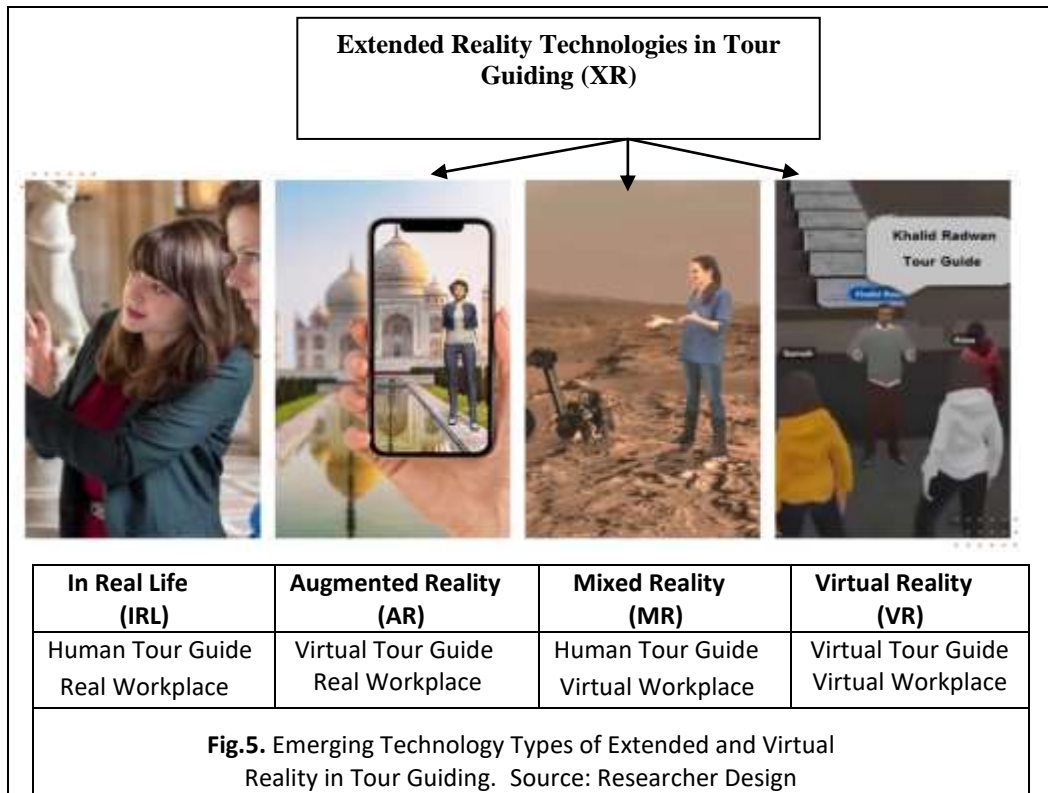
Gaafar' study (2004) Virtual Reality (VR) technology have lots of benefits in the cultural preservation and tourist guiding as well by giving tourists additional alternative options to take part in and immerse themselves in travel experiences pre visit, on-site and after visit as well.

Based on previous explanation and from a humanoid tour guides' prospective, the study can defines virtual tour guiding as "Those technological techniques that rely on generating a vivid image through intelligent screens, which have gained much popularity and acceptance in recent years, but in a way that integrates them with the profession of a humanoid tour guide in his/her traditional form as well as in a form that makes them a supportive tool for his/her work in the future and contributes to the rise in demand for the services of human tour guides". Due to the new, emerging types of tour guiding, the capacity of tour guides to operate and perform their profession's fundamental task is altering. As a result of technological innovation, there are now four different types of tour guiding, each of which can be classified firstly, according to the real or virtual form of the tour guide and secondly, according to the real or virtual workplace guide will deliver their work from. Therefore, in the age of technology, we can define the four types of tour guiding as follows:

1. **In Real Life (IRL) Tour Guiding**: that traditional type of tour guiding that combines a Human Tour Guide with a Real Workplace

2. **Augmented Reality (AR) Tour Guiding**: this emerging type of tour guiding that combines a Virtual Tour Guide with a Real Workplace.

3. **Mixed Reality (MR) Tour Guiding**: this emerging type of tour guiding that combines a Human Tour Guide with a Virtual Workplace.

4. **Virtual Reality (VR) Tour Guiding**: this emerging type of tour guiding that combines a Virtual Tour Guide with a Virtual Workplace. The distinctions between the four types are explainedin the accompanying Figure:

In Real Life (IRL)	Augmented Reality (AR)	Mixed Reality (MR)	Virtual Reality (VR)
Human Tour Guide Real Workplace	Virtual Tour Guide Real Workplace	Human Tour Guide Virtual Workplace	Virtual Tour Guide Virtual Workplace

Fig.5. Emerging Technology Types of Extended and Virtual Reality in Tour Guiding. Source: Researcher Design

A thorough description can also provide a better understanding of how these methods are actually used.

2.1. Augmented Reality (AR) Tour Guide

Augmented Reality (AR) is a technology adds a digital layer to the experience of the real world by fusing fully virtual approaches with people's actual surroundings (Özkul & Kumlul, 2019). It is regarded as the most prominent technology in large-scale virtual projects on the internet and is transforming how tourists experience a certain nation, city, plaza, street, building, monument, or museum (Attila, 2017).

Fig .6. GPS-guided tours with an AR Tour Guide by Sherpa Tours **(Glusac, 2021)**

In mobile applications that offer tourists an electronic map based on numerous artificial intelligence algorithms, such as the Everest VR app, TheBlu app, National Geographic Explore VR app, Popper app, and Blippar app, augmented reality (AR) technology is visualizing the entirety of tourist attractions, supported by information,

pictures, explanations, and interpretations of those monuments and attractions.

As many applications offer an Augmented Reality tour guide to explain and guide visitors and tourists about the historical and architectural background of their artefacts, museums are also heavily investing in the use of augmented reality technology (Hammady, Ma, Strathern, & Mohamad, 2020). One of the most well-known, cutting-edge, and unique augmented reality applications in the tour guiding is the process of bringing old, extinct cities back to their original state by default, bringing together that content, and matching it with contemporary reality to the same effect. This is the core idea of augmented reality in tour guiding.

Fig .7. Augmented Reality Tour using VR Roma Bus
(Invisiblecities.it, 2023)

The drawings and shapes that were created via the Internet and strengthened to an already gloomy effect were the foundation for the Invisible Cities VR project, whose first experiences took place in the city of Rome, specifically the old part of the city, and whose first experiences used a mobile bus in the city to test this application and ensure its

effectiveness and success. It was referred to as the Virtual Reality Bus and was equipped with distinctive OLED screens. The displays, which are attached to the tops of regular bus windows, deliver the same results as the impression of virtual freshness. The idea behind it is that anytime the bus passes a landmark to ancient Rome, these screens would allow passengers to view a virtual recreation made by archaeologists and experts in 3D animation (Invisiblecities.it, 2023).

In addition to the visual experience, users of the VR bus will be able to inhale smells that Integra perfumes have re-created and are thought to be representative of those that would have been present in specific areas of ancient Rome at the time. The entire feeling and absorption in the fundamental experience is strengthened by technology, through the operation of the five senses, which is met with unseen popularity by travelers in recent years. This constitutes a significant technological revolution in the tourist experience.

2.2. Hologram Tour Guide

One additional form of the augmented reality tour guides is the Hologram Tour Guide, Holographic methods rely on the 3D holographic imaging of laser light waves employing laser interference, diffraction, and light intensity recording in order to observe the 3D live presence in actual scale. It is a method that uses laser lights that has been altered by software (Büyükşalvarci, Altinişik, & Tekin, 2017). On the list of businesses where holographic technologies aim to be prominently present

were mentioned sciences relating to entertainment, tourism, and travel(Abdelhamid, 2020)

Fig .8. Hologram Virtual Tour Guide (Yakubov, 2018)

The most notable examples of hologram technologies in virtual tourism are the virtual tours created by companies like Microsoft, as well as the Indian companies Obizi and Euclideon,; These companies offer enormous projects focused on virtual tours around the world, most notably the 3D Holo Tours project, which markets its cutting-edge technologies with unheard-of tourism offers, starting from the Giza pyramids to the Taj Mahal (Euclideon, 2022).

2.3. Mixed Reality (MR) Tour Guide

Mixed Reality (MR) technology is a technology defined by (Kemec, 2022) as a technology that combines a realistic environment with a virtual environment to create a new reality, enabling the mixing of real objects with electronically produced objects, allowing the user to naturally interact with all objects of both types, and enabling mixed reality to occur in the real world. Similar

to virtual worlds, it combines the ideas of "augmented reality" and "virtual reality," mixing truth and assumption.

Fig .9. Destination Mars guided tour by MR Virtual Tour Guide – **(Landau, 2017)**

One of the most well-known experiments on fusing real people with a virtual environment created via the Internet and for the purpose of guiding and introducing them to the place is the NASA spacecraft experiment to explain and interpret the features of Mars to the inhabitants of the planet through mixed reality techniques. The answer to the question "What would it look like if you were walking around on Mars?" is also provided. Researchers at NASA's Jet Propulsion Laboratory in California are looking into how to take this problem from the realm of science fiction and place it in the confusing world of mixed reality, As a result, NASA and Microsoft have teamed up to offer the public a guided tour of a region of Mars with astronaut Buzz Aldrin on a project called "Destination Mars," an interactive exhibit done using the Microsoft HoloLens mixed-reality headset. (nasa.gov).

The "Destination: Mars" exhibition will continue to be accessible for several more weeks at the NASA Kennedy Space Centre Visitor Complex in Florida. Visitors will travel to a number of areas on Mars that have been recreated using accurate photographs taken by a NASA rover that has been exploring the planet since August 2012. The tour will be led by Buzz Aldrin, an astronaut from Apollo 11 who walked on the moon in 1969. Aldrin will be depicted in 3D. The public may now explore Mars in a brand-new way thanks to this project, according to Doug Ellison, a visualization producer at JPL. Curiosity's achievements and discoveries are beautifully placed in context when one strolls across the sensitive landscape it explores (mars.nasa.gov).

2.4. Full Virtual Reality (VR) Tour Guide

The Full Virtual Tour Guide or Avatar Guide is one of the earliest forms of tourist guidance that makes use of full virtual reality techniques. It is created with software based entirely on the online presence and occasionally offline, based on drawn imagination without the need to be physically present in the real-life. This strategy was widely employed by private businesses to market their goods and services to potential customers who weren't physically present. Due to the necessity for the tour guide to be physically present, this method was not necessary in its early stages. However, it was successful in reaching its purpose because to the innovative use of technology.

The urge for creative ways to display their products and influence customers from a distance to buy and promote these products is due to the growth of

globalization and international trade. With the development of virtual Metaverse worlds and the creation of parallel worlds where man cannot exist in his physical form, it was later integrated with museum artefacts, tourism destinations promotions, and guiding. Their dynamic ability to visually produce a new sense of control from tourists made this avatar tour guide culture desirable and it grew in popularity.(أبوالمجد et al., 2022)

Fig .10. Full VR Tour Guide **(Hammady, 2021)**

2.5. Metaverse Tour Guide

An evolving technological type of a virtual tour guide is the virtual tour guide in the Metaverse universe, sometimes referred to as a spatial tour guide or virtual adviser. The major tourist cities have already reserved their spaces from those worlds, and they have started to establish their cities to create a parallel economy that aims to improve the city economically in addition to marketing it for tourism and entertainment as well. This is evident from what has been accomplished thus far in the cities of

virtual worlds. (Allam, Sharifi, Bibri, Jones, & Krogstie, 2022)

Fig .11. Spatial virtual tour guide mediates a virtual group of visitors - Nefertari Palace Opening - Metatut city- Metaverse **(Metatut, 2023)**

Instead, the issue has advanced to the point of adding and creating tourist attractions that do not already exist on the ground, or rebuilding extinct tourist and archaeological attractions that are expensive to recreate in reality, which created the need for the presence of the tourist guide or what was previously known as virtual advisors. Their role is to inform visitors about the city and its services by pointing them in the right direction. In the Metaverse realms, the virtual tour guide's job is to interpret or explain the supplemental digital material. It is projected that this form will lead to an increase in the number of digital or electronic tour guides in the future. This role is represented by an entirely virtual figure with a symbolic human body (avatar).

Since the Metaverse Corporation and the apps it offered made such great strides, effort is being done to make it possible for everyone to have virtual bodies within an application that enables many individuals to conduct business online in wholly virtual worlds. The ability to create digital versions of themselves will enable human tour guides to run their entire operation online.

3. Distance Tour Guiding

With its many tools, technology has also made it possible for many jobs to be performed remotely. It's possible that the job of a tour guide is one of those that is challenging to carry out remotely because it depends so heavily on the interaction between the tourist and the tour guide who is accompanying him. However, as a result of Corona's need for this service, a culture of working remotely has emerged. Numerous professions, such as that of a tour guide, have been able to survive and thrive in the face of crises, which is also what gave rise to their importance for long-term sustainability and established them as a future trend in the field of tourism guidance.

The study defines "Distance Tour Guiding" as "a new type of tour guiding handled by the human tour guide through the use of contemporary technology, such that the tour guide is present at the original tourist site and the tourist is exist or present in another area." Just a few examples of the technology devices that are utilized to promote interaction, communication, and remote services include mobile phones, cameras, headphones, and attached headsets. A distant tour guiding can give both tourists and guides the flexibility and freedom to create

tour itineraries based on their preferences, in contrast to the typical predetermined courses of tours in actual tour guiding.

3.1. Distant - Remote Tour Guide

One of those concepts that crystallized and imposed itself as a result of the Corona crisis is remote tourism guidance. Numerous tourists and travelers approved of it, and it played a significant role in the creation of new processes and techniques for the maintenance of numerous occupations that required physical presence, like the profession of a tour guide.

In order to attract tourists to tourist destinations despite their physical absence, it was necessary for the remote tour guide to emerge, also known as the virtual trip. At first, this seemed challenging because the job of a tour guide is, at its core, about guiding travelers through their country. And those who are already there and those who must do their duties in their absence but find it impossible to do so. The experience of the Scandinavian Faroes Islands group, which was presented by the government tourism department in the islands during and after the Corona pandemic and through the residents who worked as tour guides offering their trips to virtual or remote tourists by controlling the tour guide's movements through an application similar to interactive games in real time, is one of those pioneering experiences in using virtual reality technologies.

For the tour guide's availability at the tourist site. It is the first experience of its kind for remote tourism, and it

can be accessed from a computer or a mobile device. The tour guides are equipped with live video cameras so that the tourists can not only direct where and how they explore by turning, walking, or running using the control panel, just like in a computer game, but also watch the area in real time(Remote-Tourism.com, 2020).

Fig .12. Remote Tour Guide Faroe Islands
(Remote-Tourism.com, 2020)

According to Butcher (2022) one of the forerunners in the use of virtual reality technologies for tourist assistance is the Heygo.com platform. The British application is a platform that performs with professional and amateur tour guides on trips and offers a live broadcast service for travels in the form of video using live broadcast technology.

It focuses on remote travel experiences, enables individuals to travel virtually, and performs with tour guides on trips. The platform's statistics show that travelogues are aired throughout 110 nations worldwide, with 2570 tourist destinations and sights being virtually toured and given historical and archaeological

explanations. Up to 2022, the virtual tour will have more than 600 tour guides and 2 million users and visitors.

Fig .13. Distance Tour Guide - Edinburgh Old City Tour
(Butcher, 2022)

Conclusion

The objectives of the study is to introduce a new technological trends in the field of tour guiding, that emerged and developed in response to the industry's rapid adoption of technology applications, which altered the nature of many jobs and brought in cutting-edge working practices in addition to the conventional traditional ones. The Corona epidemic also had an impact on the evolution of many modern ideas about how professions should be practiced, which resulted in the distant emergence of a great deal of practices and procedures that assist work performance. The virtual tour guide and the remote tour guide are thus the most famous instances of these new developments.

A large difference appeared in the demand for these types of visits and virtual trips, especially during and after the pandemic. Numbers and statistics were used to demonstrate the extent to which virtual technologies have gained growing interest from tourists and visitors in obtaining information about a specific tourist attractions and travel destinations. Examples were given for each sort of virtual tour guide, and the term "virtual tour guide" was defined from a human perspective, which is very different from the definition of a "virtual tour guide" given by technology developers.

One of the study's key findings is the classification of the nations with tourists who are drawn to the idea of virtual vacations. This categorization and arrangement will be extremely beneficial in creating future plans for the crucial technical approaches that must be used to attract these tourists and use the profession of a tour guide to satisfy his objectives and interests in tourism.

In addition to the hologram guide and the guide in the Metaverse environment, virtual tour guide also included augmented reality, mixed reality, and fully virtual reality technology. Tour guiding was also characterized as delivering services to a visitor who is not physically present at the tourist destination by the tour guide, which the pandemic found absurd or undesirable. By engaging them to generate numerous chances, particularly during low seasons and times of crisis, these new forms of tourism guiding offer human tour guides.

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