



Master in Planning and
Management of Tourism Systems



Virtual Reality & Augmented Reality

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INTRODUCTION

in 1990s SEGA,
Nintendo and other
videogame companies
released to the market
the first headsets for
VR, but technology was
not mature yet

INTRODUCTION

VR was abandoned until 20 years later, when Palmer Luckey, an American teenager, in 2010 built in his garage the Oculus Rift, the first modern VR headset

Palmer
Luckey

Oculus
Rift



INTRODUCTION

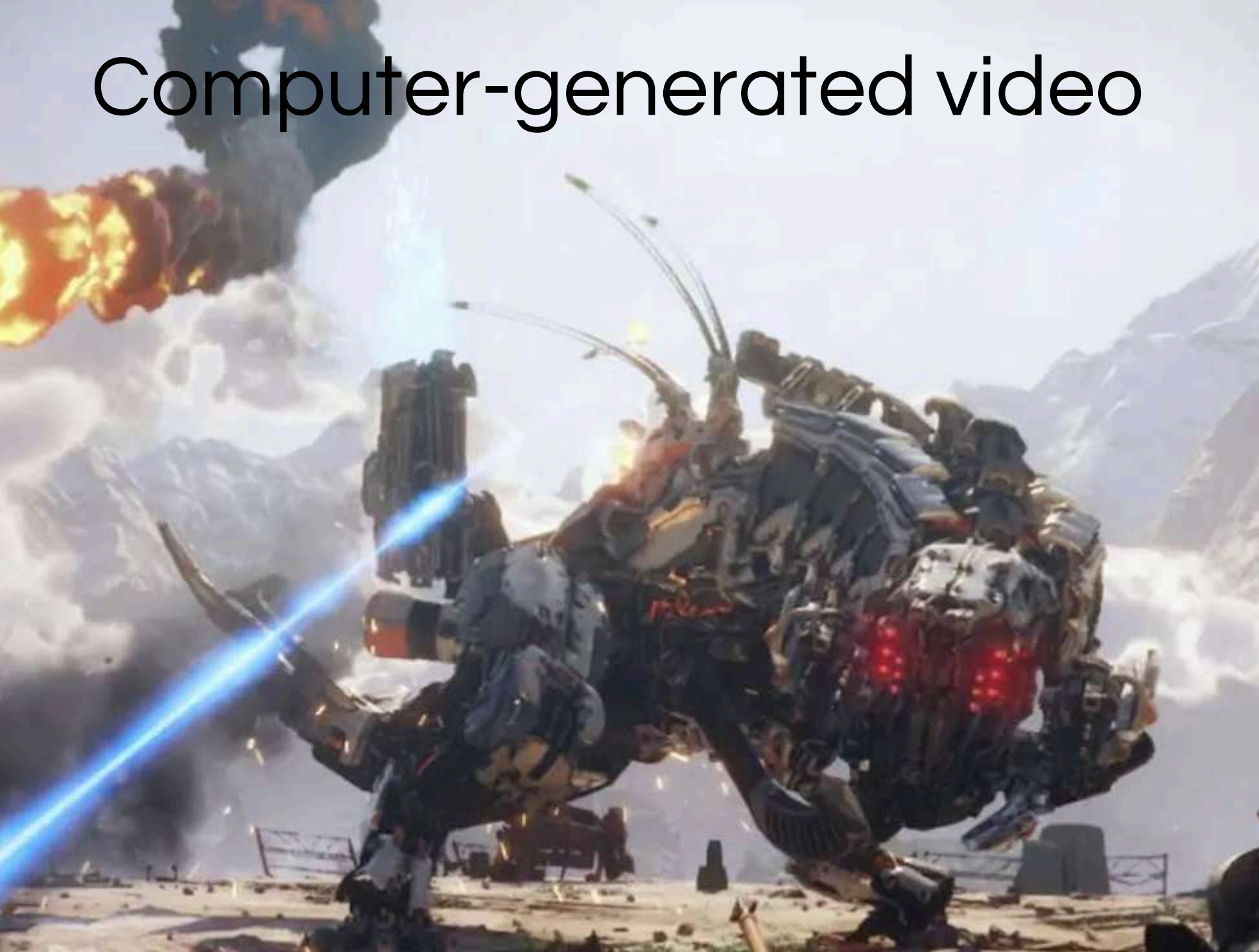
He sold it through a **Kickstarter** campaign that raised \$2.4 millions and founded company **Oculus**, that **Facebook** acquired in 2014 for **\$3 billions**

Palmer
Lucky

Oculus
Rift



Computer-generated video



Real-world simulation



There are two different forms of VR: the first one employs computer generated imagery (e.g: VR games); the second one simulates the real world instead and is called 360 VR

VR CAMERAS


This is achieved using
omni dimensional
cameras (VR cameras).
VR cameras record 360
degrees **photographies**
in order to build 360
videos.





There are three types of headsets: mobile headsets which combine a smartphone with a mount

...Tethered headset that are just a display controlled by another device, like a PC or a video game console



...and **standalone headsets** that have all necessary components to provide virtual reality experiences integrated into the headset.



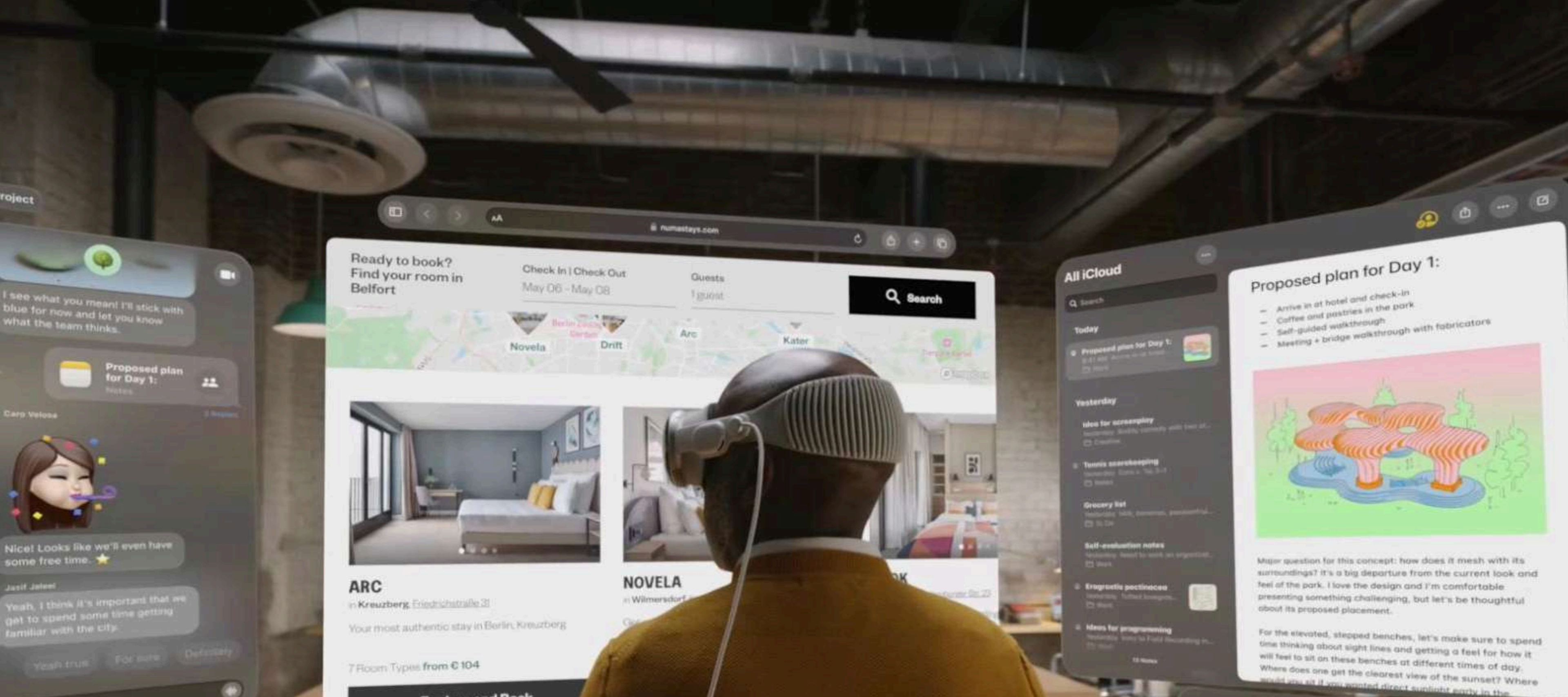
Meta Quest 3



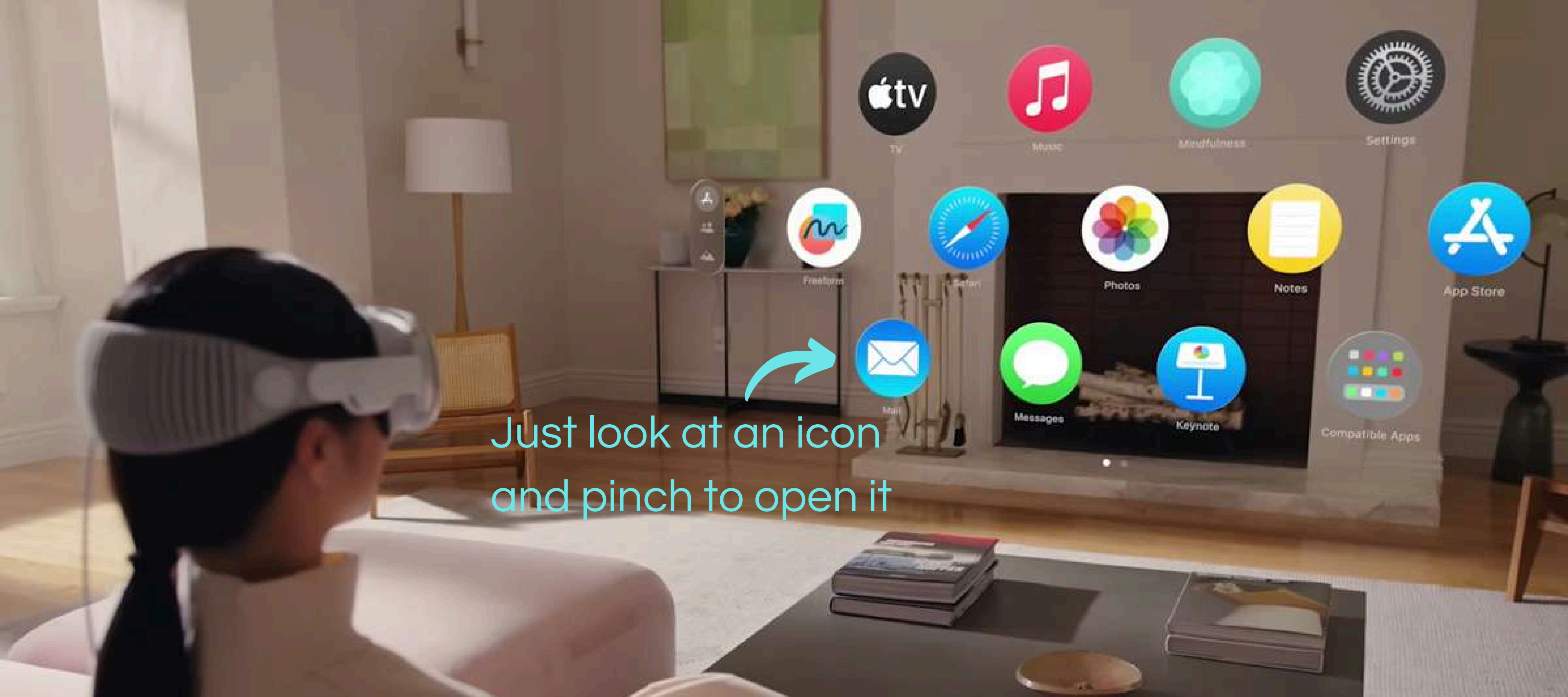
Sony PS VR2



The most popular headsets in 2023 are the [Meta Quest 2](#) (standalone) and the [Sony Playstation VR2](#) (tethered)



Apple recently announced its [Apple Vision Pro](#), that combines both VR and AR




Just look at an icon
and pinch to open it

Its eye tracking system allows to replace mouse click with the pinching of the index finger and thumb together

VR TOURIST VIDEOS

There are two types of 360 VR videos/photo for tourism:

- Monoscopic
- Stereoscopic

A wide-angle photograph of the Rialto Bridge in Venice, Italy. The bridge is a long, white stone structure with a decorative balustrade, spanning a canal. On the left, the ornate facade of the Basilica di Santa Maria della Salute is visible. On the right, a classical building with a loggia is seen. A gondola is visible in the water below the bridge. The sky is blue with some clouds.

Monoscopic VR tourist videos/photo work much like a normal video: they can be viewed on smartphones and PC too. The viewer can **click and drag the mouse on the screen** to rotate the field of view, similar to turning the head to explore a scene (e.g: **Google Street View**)

A woman is shown from the chest up, wearing a black VR headset and holding it with both hands. She has a joyful expression, with her mouth open as if laughing or speaking. The background is a vibrant, tropical beach scene with palm trees, a sandy shore, and turquoise water under a blue sky with soft, colorful clouds. The scene is presented in a stereoscopic format, typical of VR content.

Stereoscopic VR tourist videos only works for VR headsets and feature head tracking, so the tourists can move their head to explore the surroundings in a more realistic way

AirPano VR specializes in virtual tours of the most beautiful places of the world, e.g: Angel Falls in Venezuela


https://www.youtube.com/watch?v=L_tqK4eqelA

VR IMPACT ON TOURISM

There are three main types of applications of VR to the tourism sector:

- VR travel experiences
- VR for travel agencies
- Virtual hotel tours





VR travel experiences are stereoscopic VR tourism videos that create the same feelings and emotions of being in the real destination, giving users a taste of what it's like to be there

A man with a beard is wearing a black VR headset with a yellow heart logo and the text "Thomas Cook" on the front. He is also wearing white headphones. In the background, a woman is sitting at a desk, and there are palm trees on the wall. A computer monitor with the "acer" logo is visible. A dark blue rounded rectangle with white text is overlaid at the bottom of the image.

VR for travel agencies replaces classic brochures and screens inside the travel agencies, to offer prospective clients short video clips of virtual travel experiences instead

Virtual hotel tours are usually monoscopic VR tourism videos that allow users to explore a hotel with a 360° interactive tour in which the users can choose which rooms to explore



Examples



Thomas Cook Airlines offers helicopter flights over Manhattan. Their bookings tripled when they created a VR tour using 360° recordings of their helicopter flights





Both British Museum and Louvre offer virtual tours

<https://www.britishmuseum.org/blog/how-explore-british-museum-home>

A large-scale VR projection of Van Gogh's 'The Starry Night' in a dark room, with a crowd of people watching. The projection covers the walls and ceiling, creating an immersive experience. The sky is filled with swirling blue and green patterns, and the stars are depicted as bright yellow and white points of light. The crowd of people is visible in the foreground, some holding up their phones to capture the scene.

In Milan there is an exposition where visitors enter into the paintings of Van Gogh using AI-powered VR

<https://vangoghexpo.com/milano/>



AI is able to simulate **Van Gogh's style** to fill the room (physical or virtual) with every changing painting

<https://vangoghexpo.com/milano/>



Sandy Lane Hotel, Barbados

<https://www.youtube.com/watch?v=Lbq6lQgHhKM&t=181s>



A guided virtual city tour of London

<https://www.youtube.com/watch?v=m9ECIKKA1VeQ>



360°

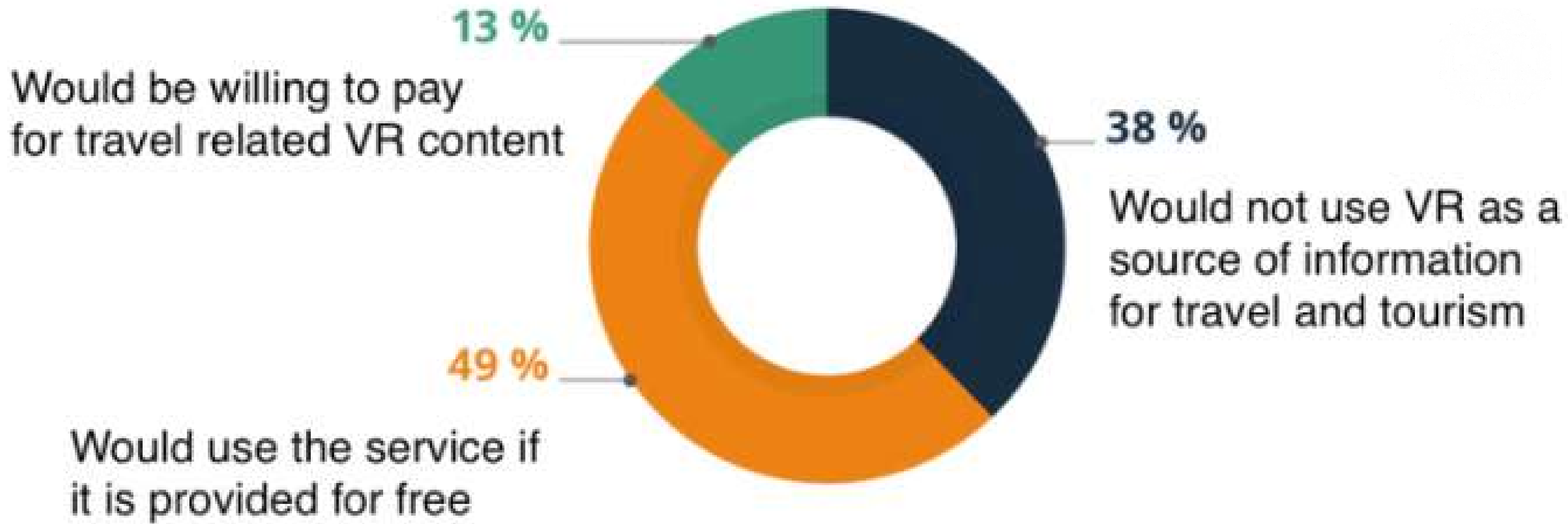
National Geographic made underwater VR videos

<https://www.youtube.com/watch?v=v64KOxKVLVg&t=51s>

VR IMPACT ON TOURISM

Advantages of VR for tourism sector are many

- Explore a location at will
- Try before you buy approach
- Make consumers think about travelling to places that they wouldn't have considered otherwise
- Reduce overtourism by simulating visit to vulnerable destinations
- Providing travel experiences to those who cannot travel (e.g: old or sick people)
- Allow travel companies to stand out from the crowd



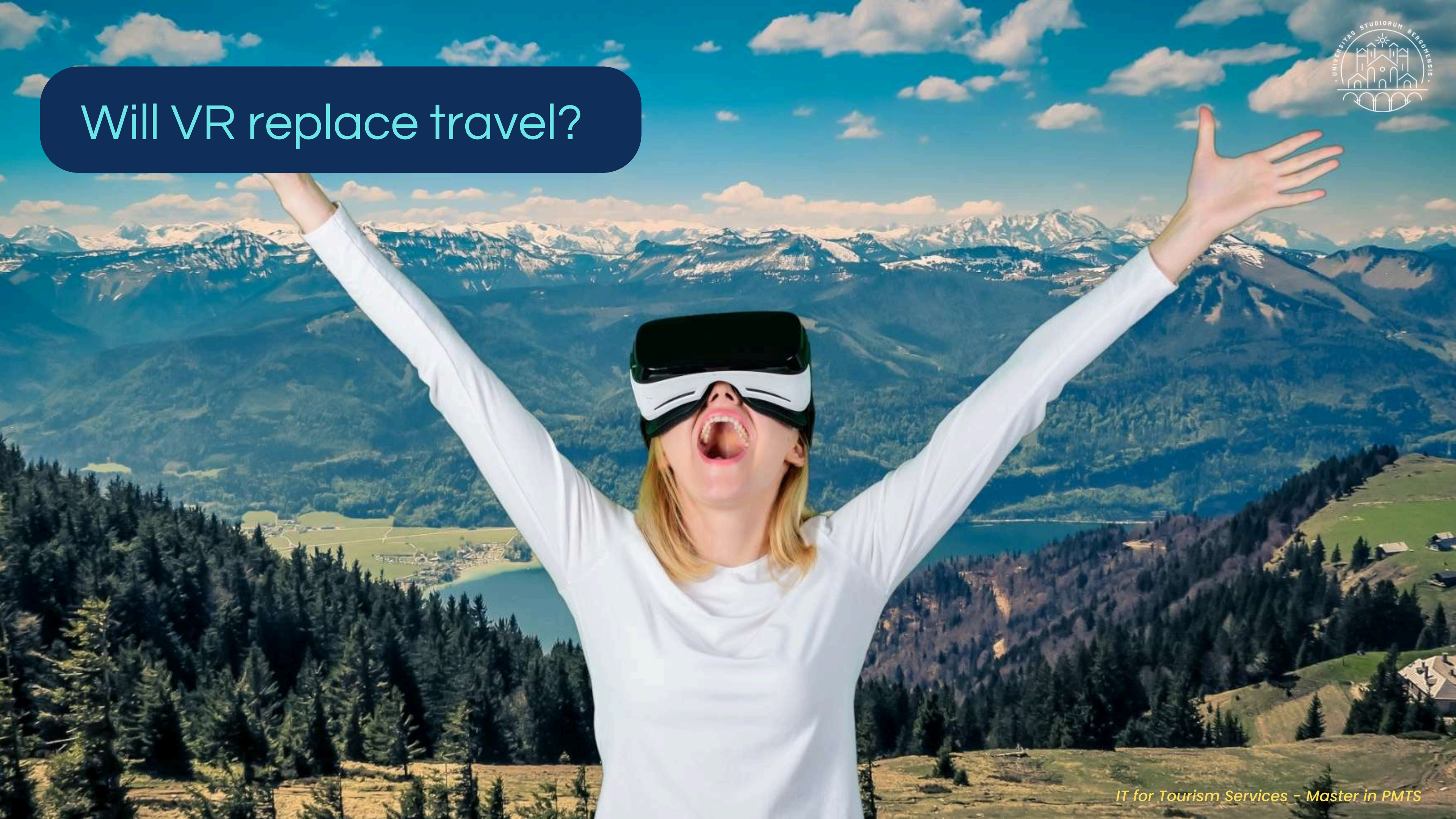
Source: Statista Digital Market Outlook

50% of people'd use VR as a tool for choosing their holiday destination, provided it is free. 13% of people would be willing to pay for the VR



VR has some issues to solve before becoming mainstream: motion sickness, eye stress, lack of vision of the surroundings, high costs and the screen-door effect

Will VR replace travel?



Will VR replace travel?

82% of people said **no**

92% said that visiting a destination in VR is **not the same** as in real life

77% cited **tasting local food** as being important to them

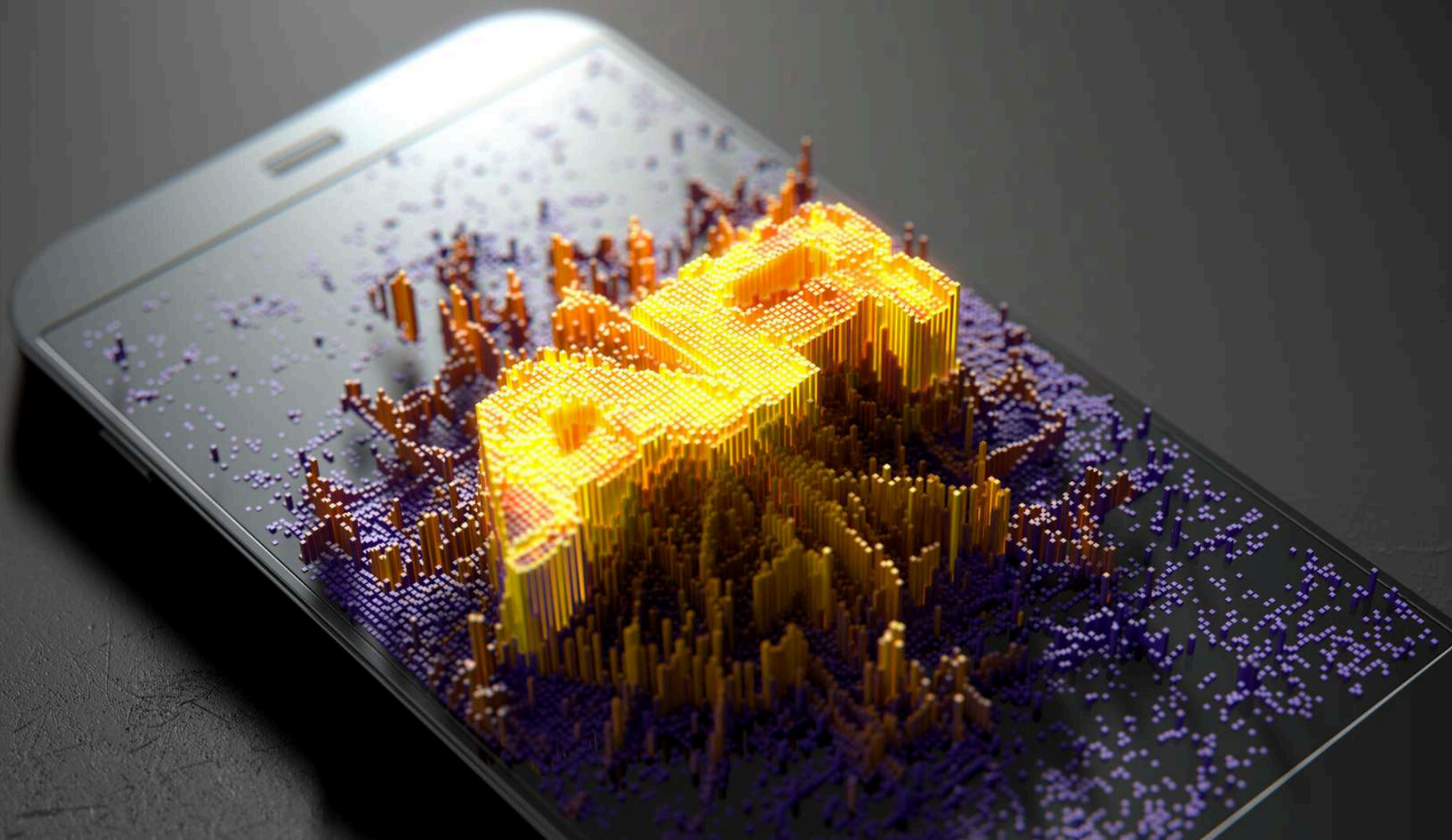
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It's pretty safe to assume that **VR won't replace travel** anytime soon. It is just a useful tool for **marketing**



AUGMENTED REALITY

AR is an example of **disrupting technology**: an innovation that no one expected and with a **big impact** on society





AR consists in overlapping digital content over images or video of the real world thanks to sensors that track the position and orientation of the device (e.g: GPS, compass)



All it takes to access an AR system is a device with **GPS**, **webcam** and **internet connection** (standard in every smartphone, tablet or PC): AR is **within the reach of all**



Pikachu



AR was made popular in 2016 by the game **Pokemon GO**.
Its app was downloaded **a billion times**

An ancient gate of **Seoul** was **rebuilt virtually** with AR. Physically it'd have been impossible as the city grew around it.

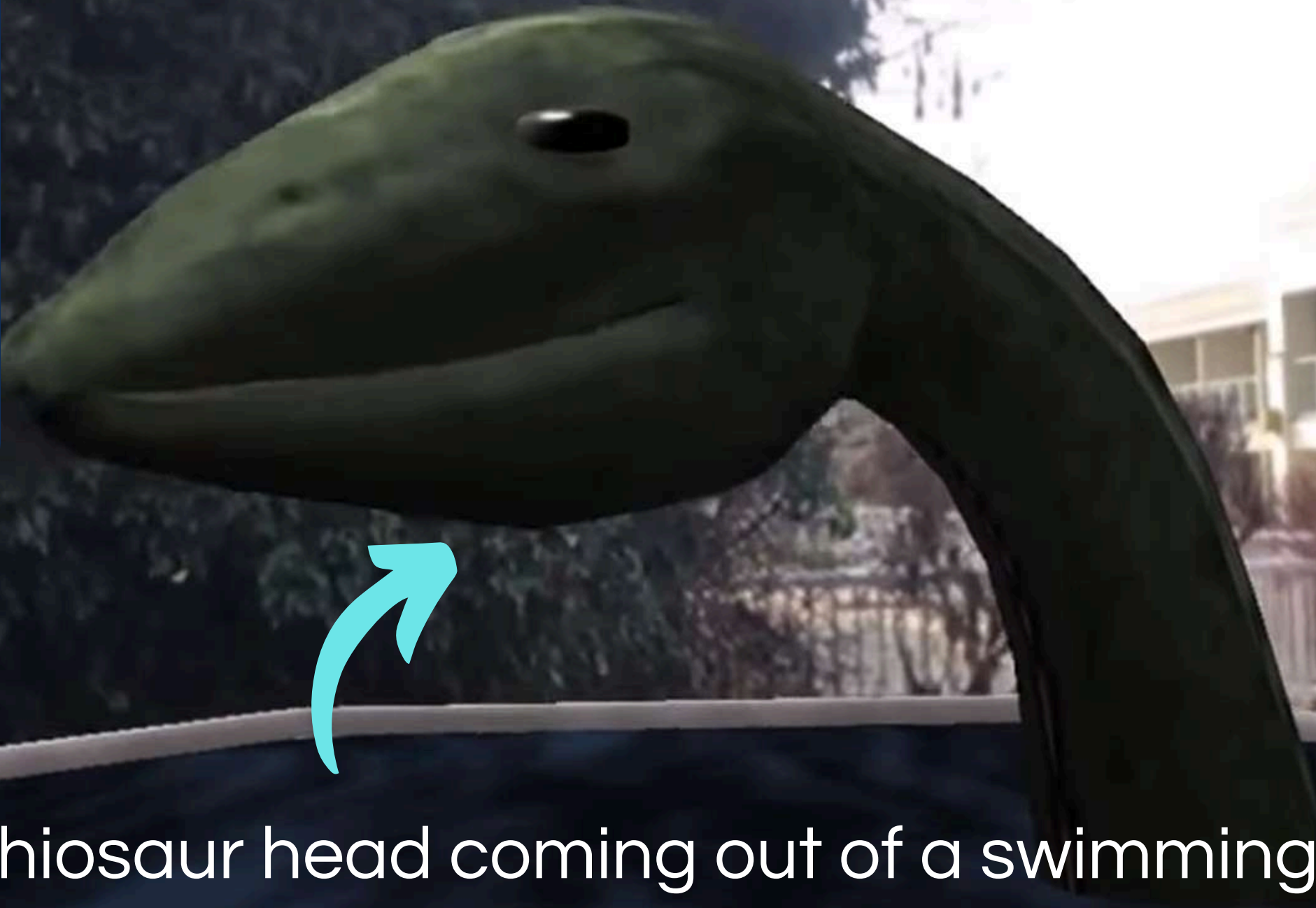


This is an example of smart tourism, e.g: of improving the touristic experience thanks to IT (in this case, explore a long-forgotten history of the city)





App **Sauria**:
children can
collect all kind of
digital dinosaurs
around **museums**
or **hotels**



Branchiosaur head coming out of a swimming pool
in a Best Western hotel



It works well also in other locations



Some hotels attract guests by offering them AR gamification: interactive experiences (e.g: quests, treasure hunts) overlaying virtual objects into the hotel's rooms



<https://www.youtube.com/watch?v=RILcP5B7wbA>

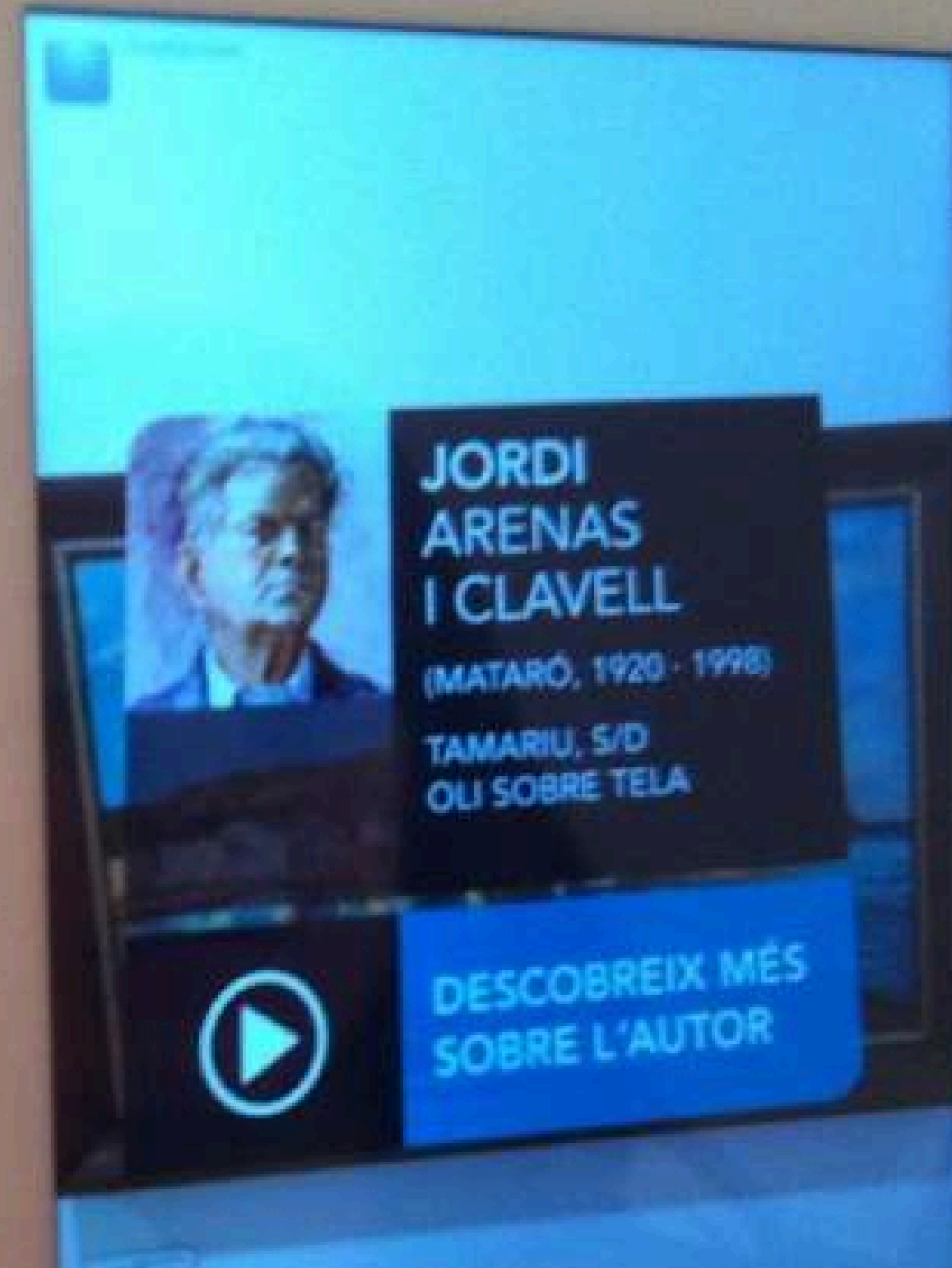
Example: promote cities like [Alghero](http://www.playalghero.it) (www.playalghero.it)



City Tour apps display info on the screen regarding places of interest, museums, galleries, and other tourist attractions



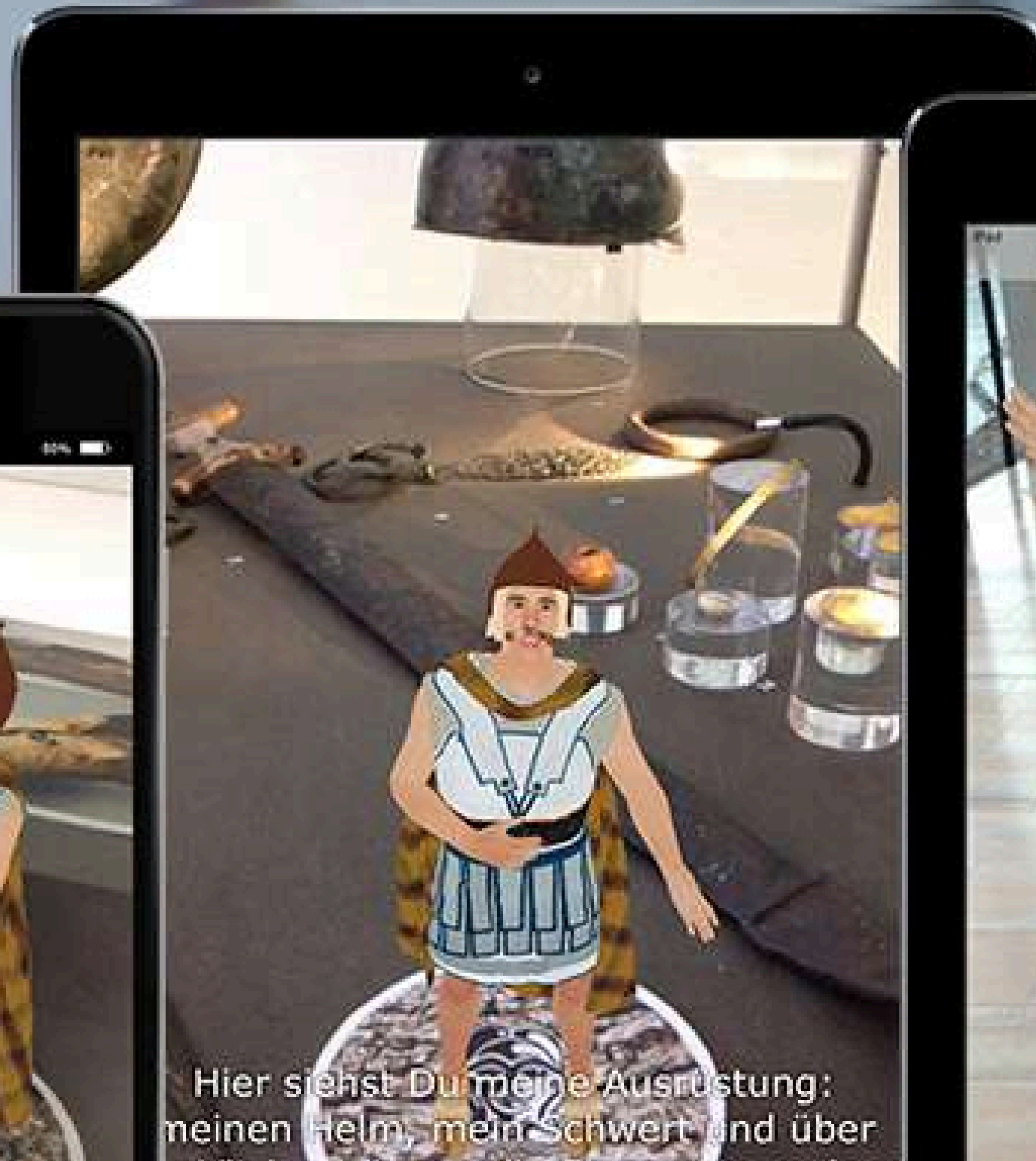
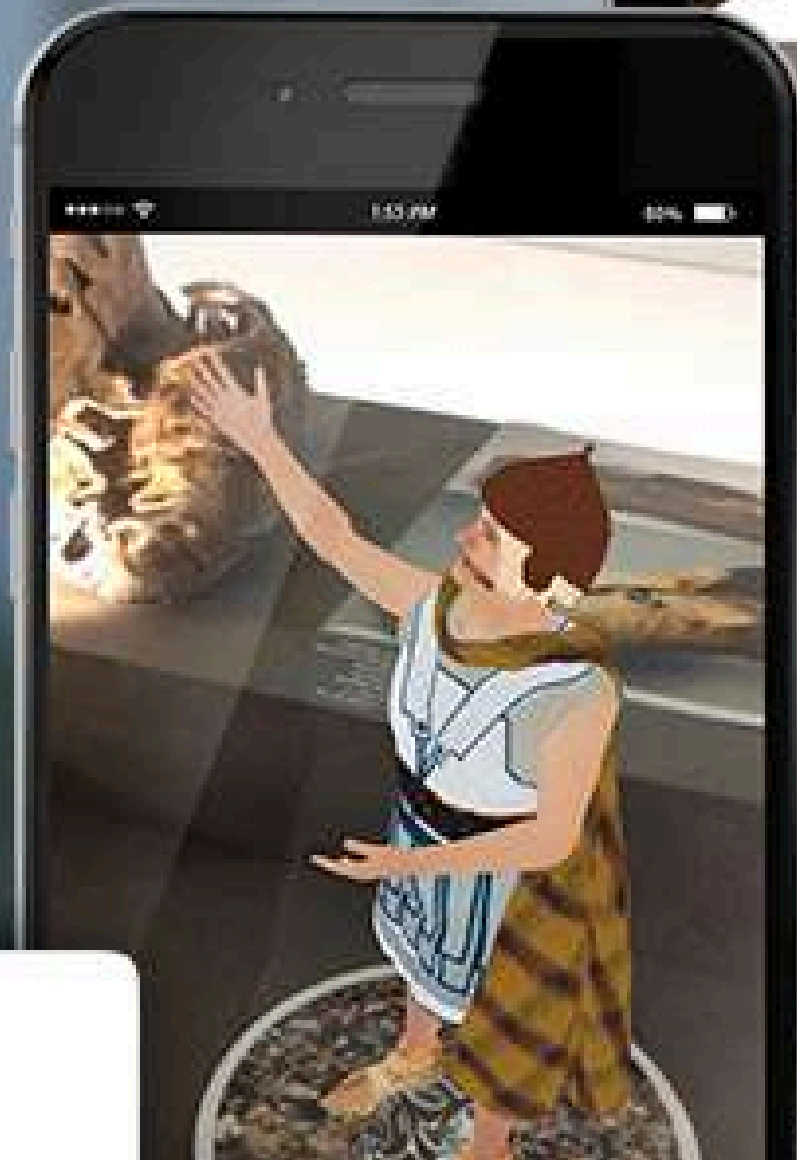
They can also include **audio**, announcing features of interest at a particular site when they become visible to the user



tant en essència com per la
immensitat de la natura com
un violent onatge que travessa

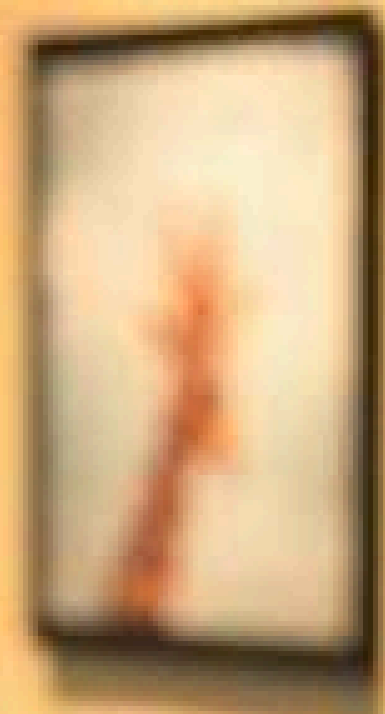
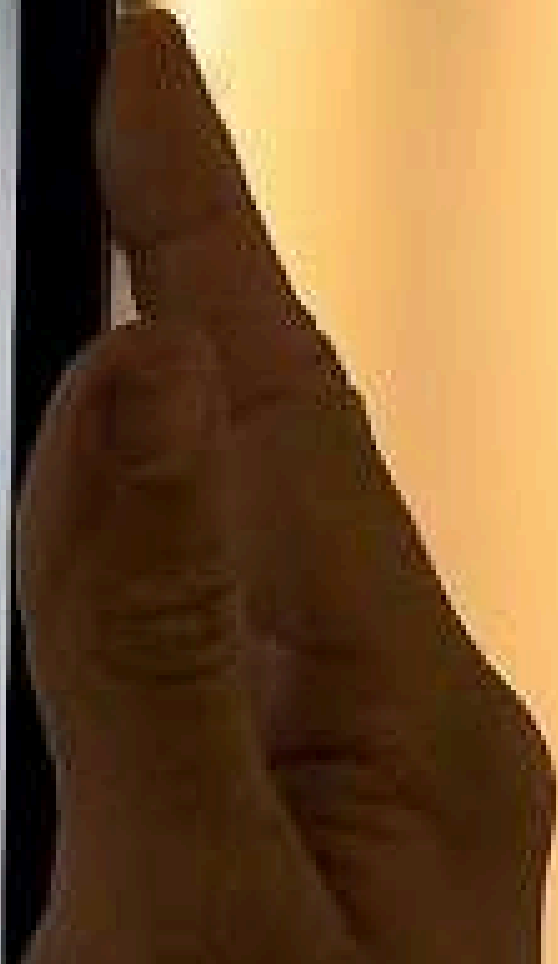
eficàcia es tradueix en un
na, on també hi té presència
persones accentua aquesta
el qual ens n'allunyem quan
de color, llum i moviment.

There are many possibilities for the use of AR in museums.
E.g: to show more information when visitors view exhibitions



You can also display a virtual version of the artist or of the portrait subject next to the artwork, and make him/her speak to provide a narration of the artwork





You can bring objects or scenes to life



You can bring objects or scenes to life



Or restore broken objects to their original form



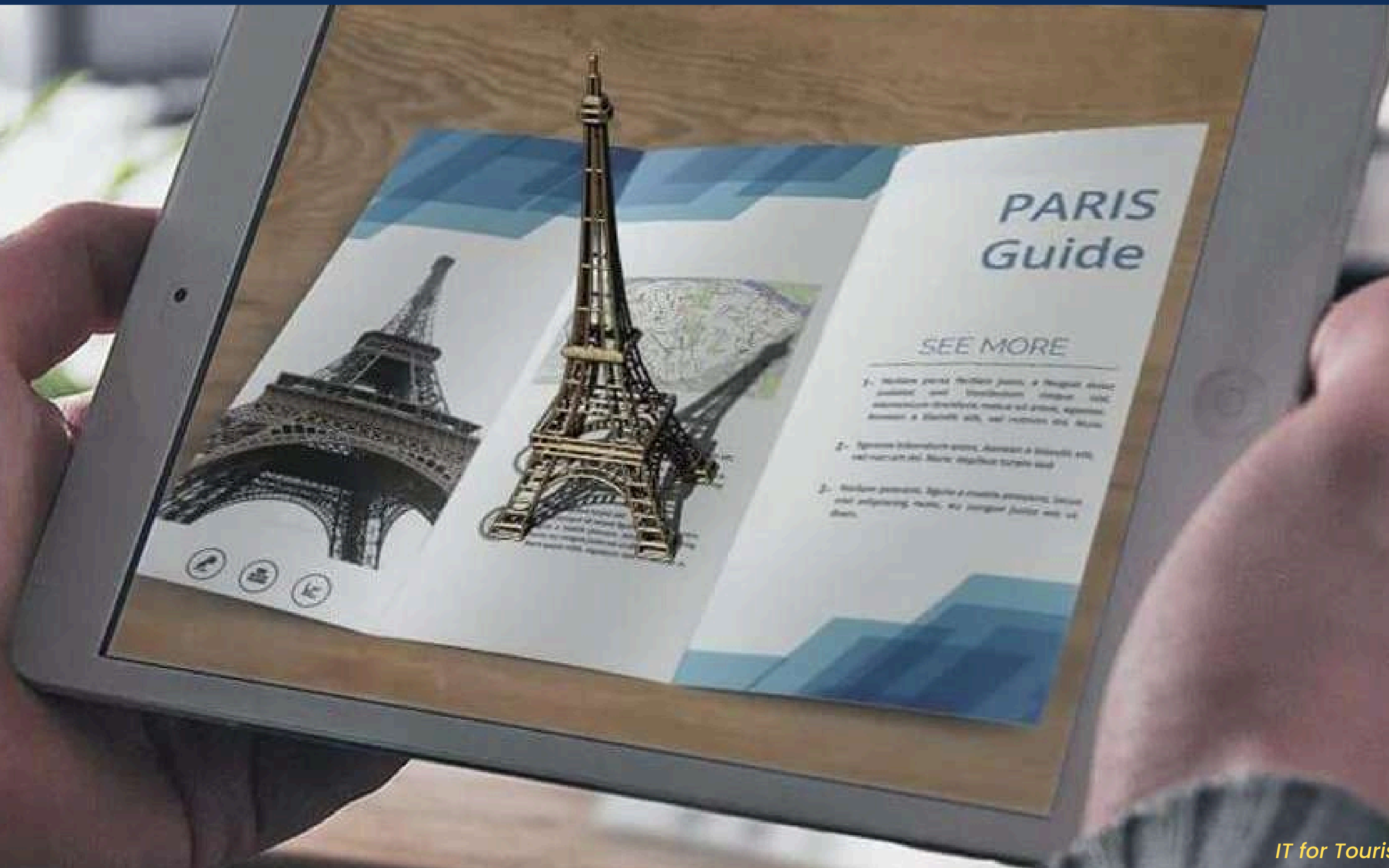
...and even recover paintings that were stolen



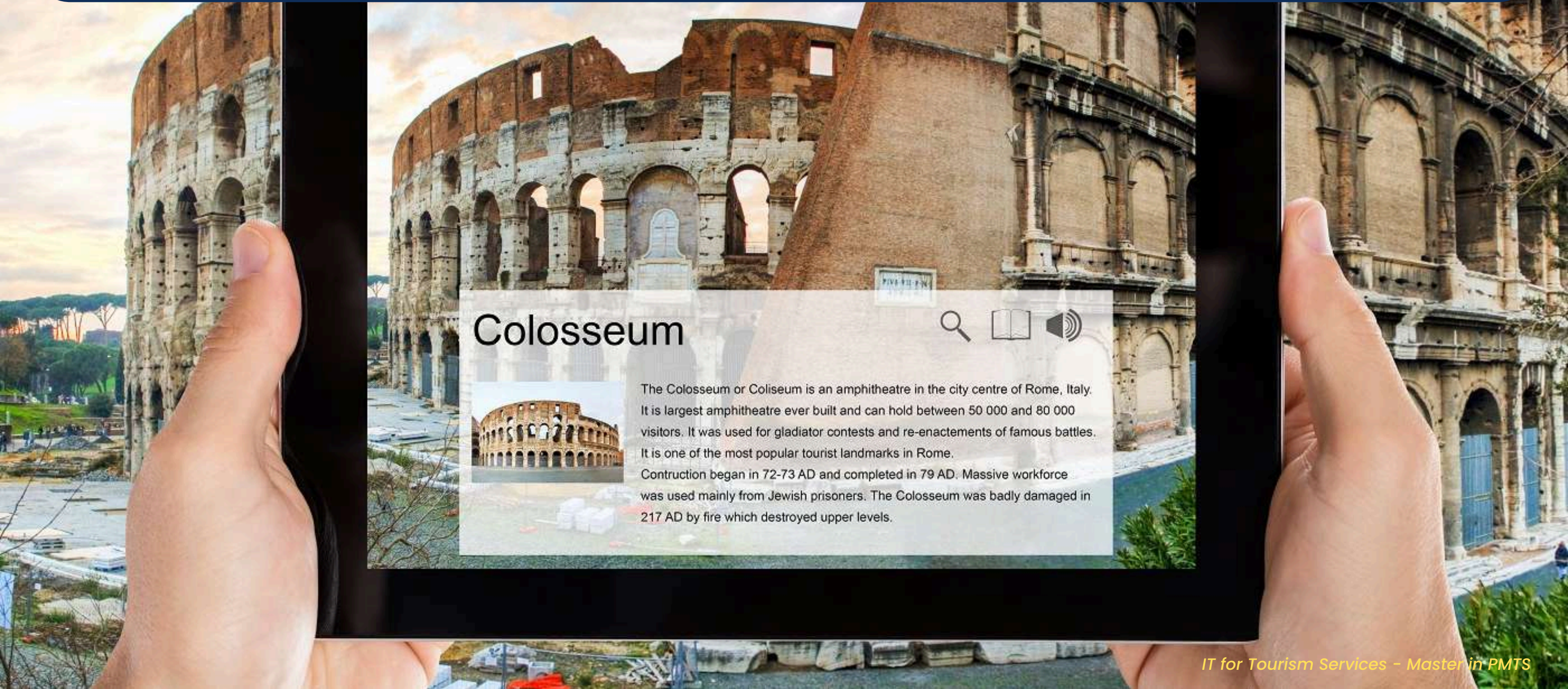
GIVE YOUR
ART
A LIFE
WITH
AR

Possibilities are endless

Travel agencies can also employ brochures that AR transforms in a 3D version to advertise the location



AR is less used than VR to advertise travels and locations. It is usually employed to enhance the touristic experience



Colosseum

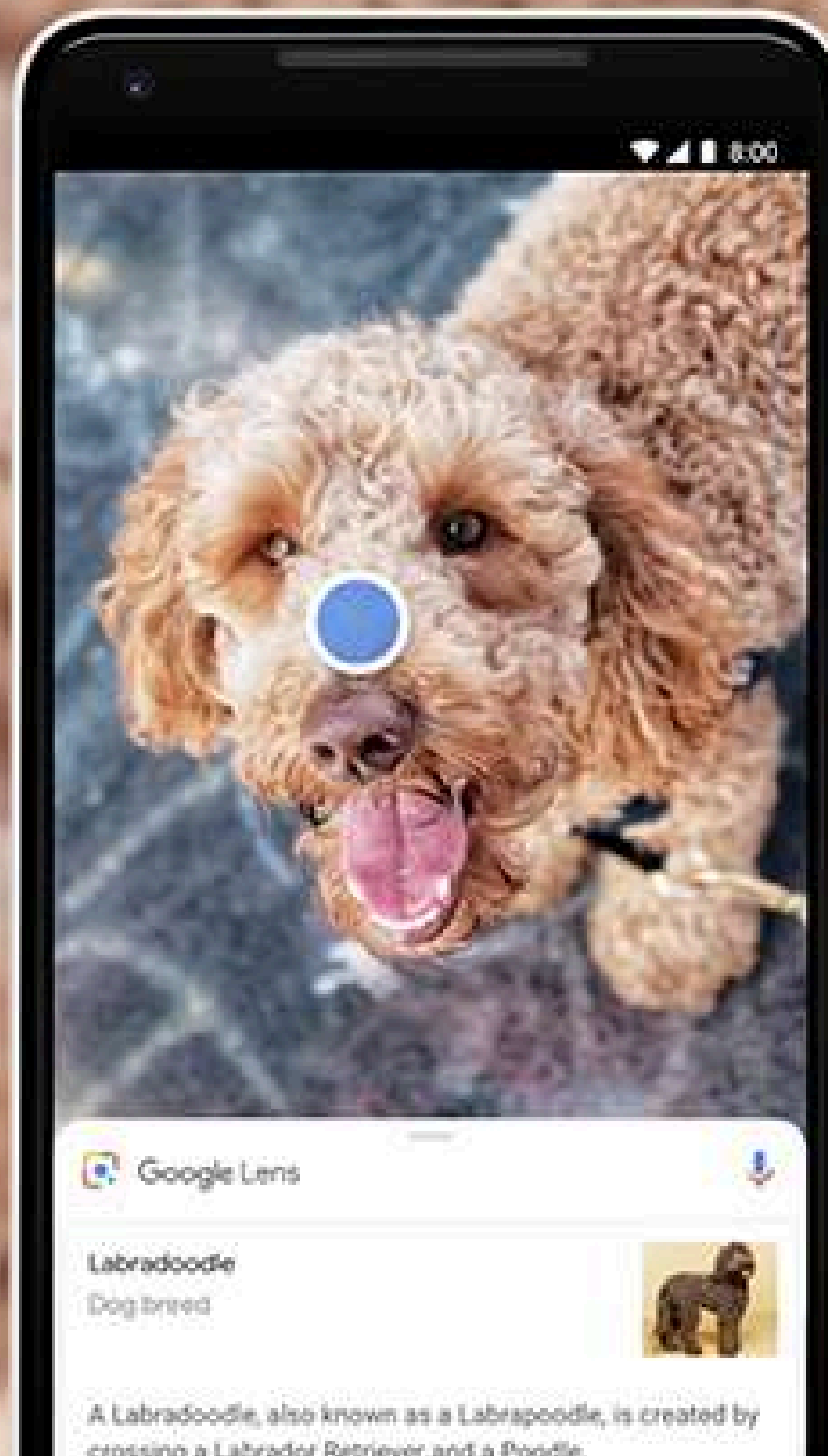


The Colosseum or Coliseum is an amphitheatre in the city centre of Rome, Italy. It is largest amphitheatre ever built and can hold between 50 000 and 80 000 visitors. It was used for gladiator contests and re-enactments of famous battles. It is one of the most popular tourist landmarks in Rome. Construction began in 72-73 AD and completed in 79 AD. Massive workforce was used mainly from Jewish prisoners. The Colosseum was badly damaged in 217 AD by fire which destroyed upper levels.

ВЫХОД В ГОРОД

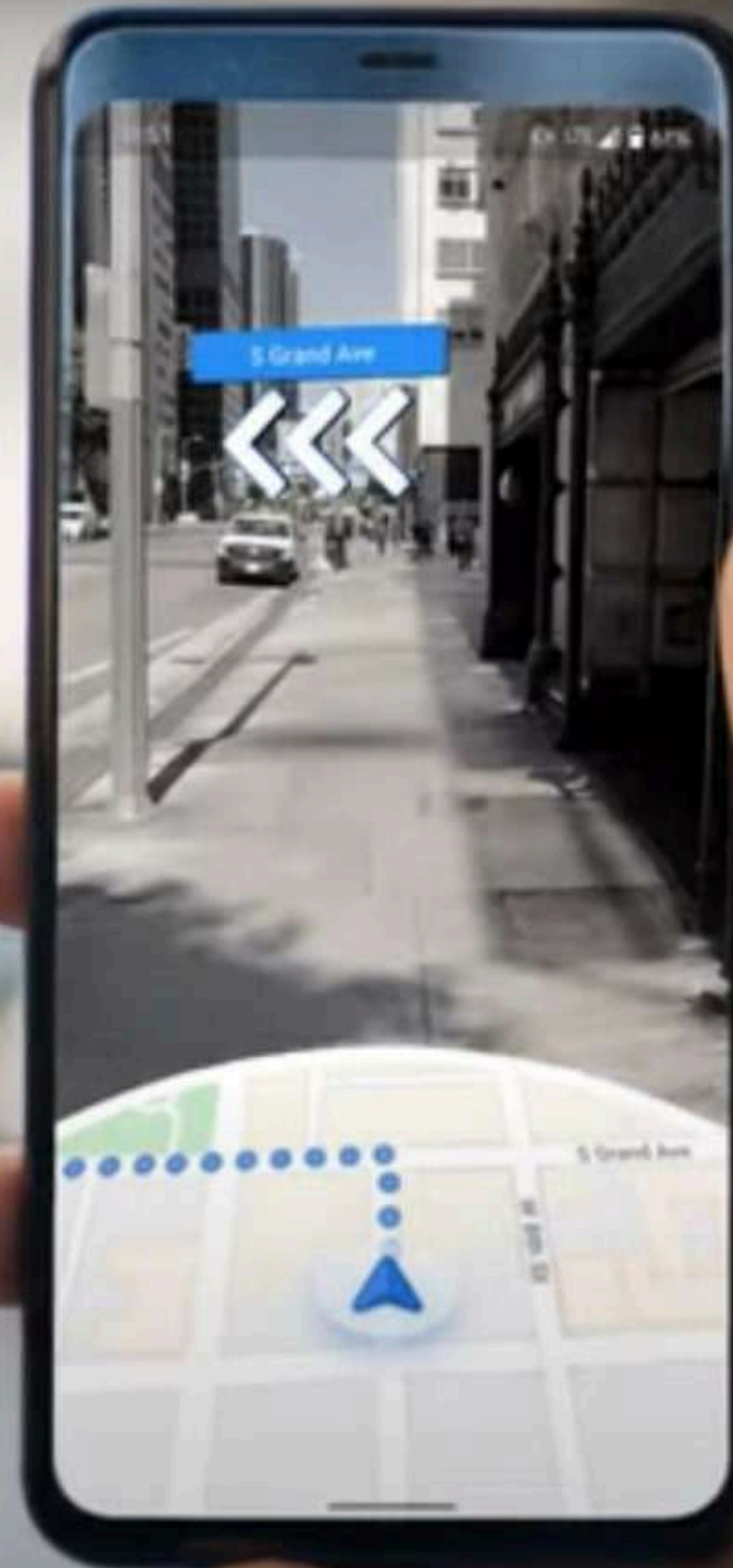
ACCESS TO CITY

With app **Google Translate** let you point out your camera towards any text around you, and the app replaces it instantly with its translation



Google Lens is a powerful IT: users point the smartphone at an object to identify what it is, give informations about it and eventually where to buy it

Google Maps has a feature called "Live View" that directs you to your destination thanks to virtual arrows and pointers



- Tschuggen 2521 m
- Drättehorn 2794 m
- Schwarzhorn 2927 m
- Rothorn 2526 m
- Glogghüs 2534 m
- Fulenberg 2374 m
- Hochstollen

ARAlpineGuide is a free app to identify mountain names



IKEA Place allows users to preview IKEA furniture in their houses

Snapchat
employs a form
of AR to apply
filters and add
special effects



Cartoon 3D Style
by Snapchat

VALENTINE'S DAY

MAKEUP LOOKS



COLOR

YOUR HAIR



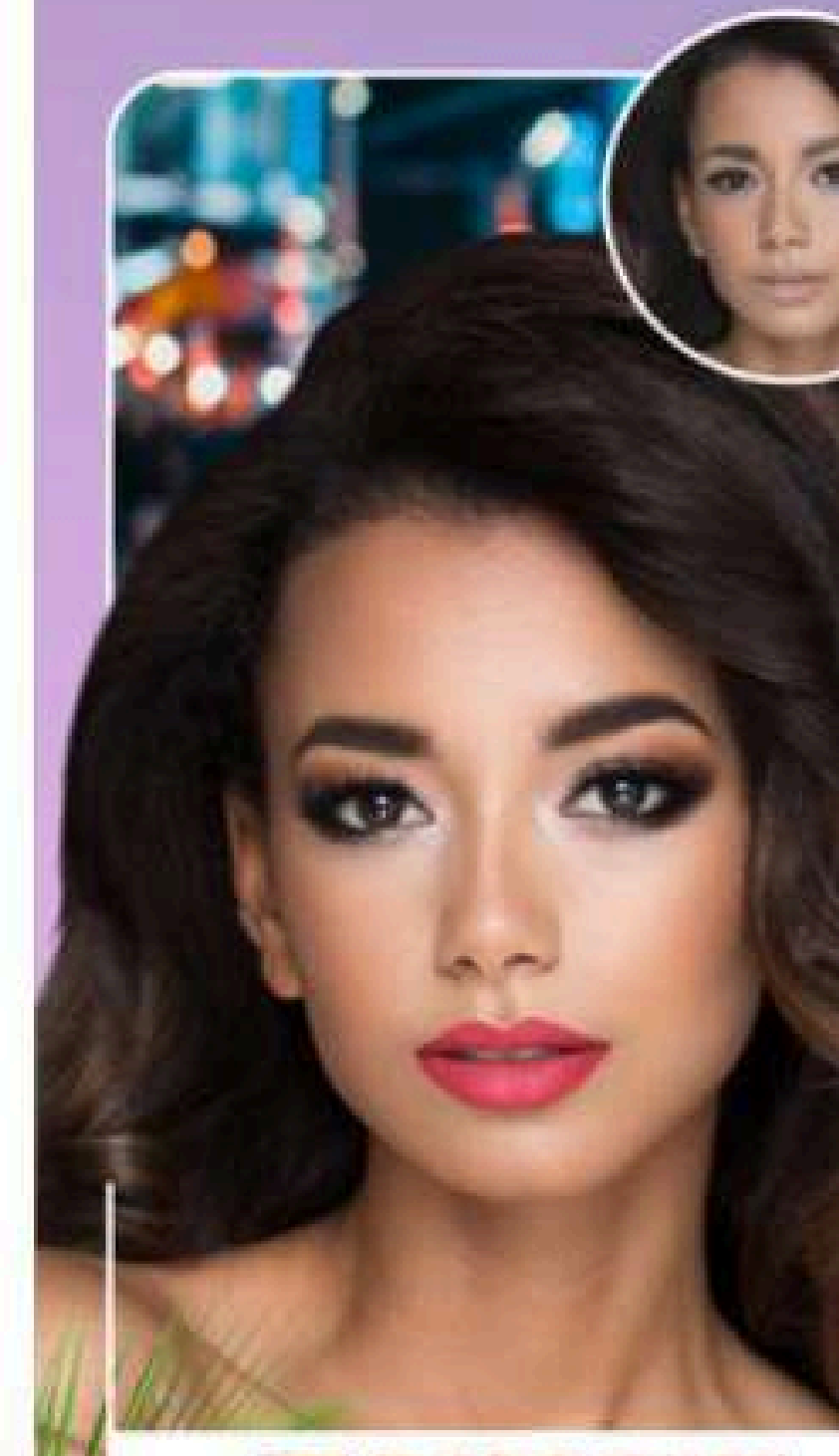
BACKGROUND

ERASER



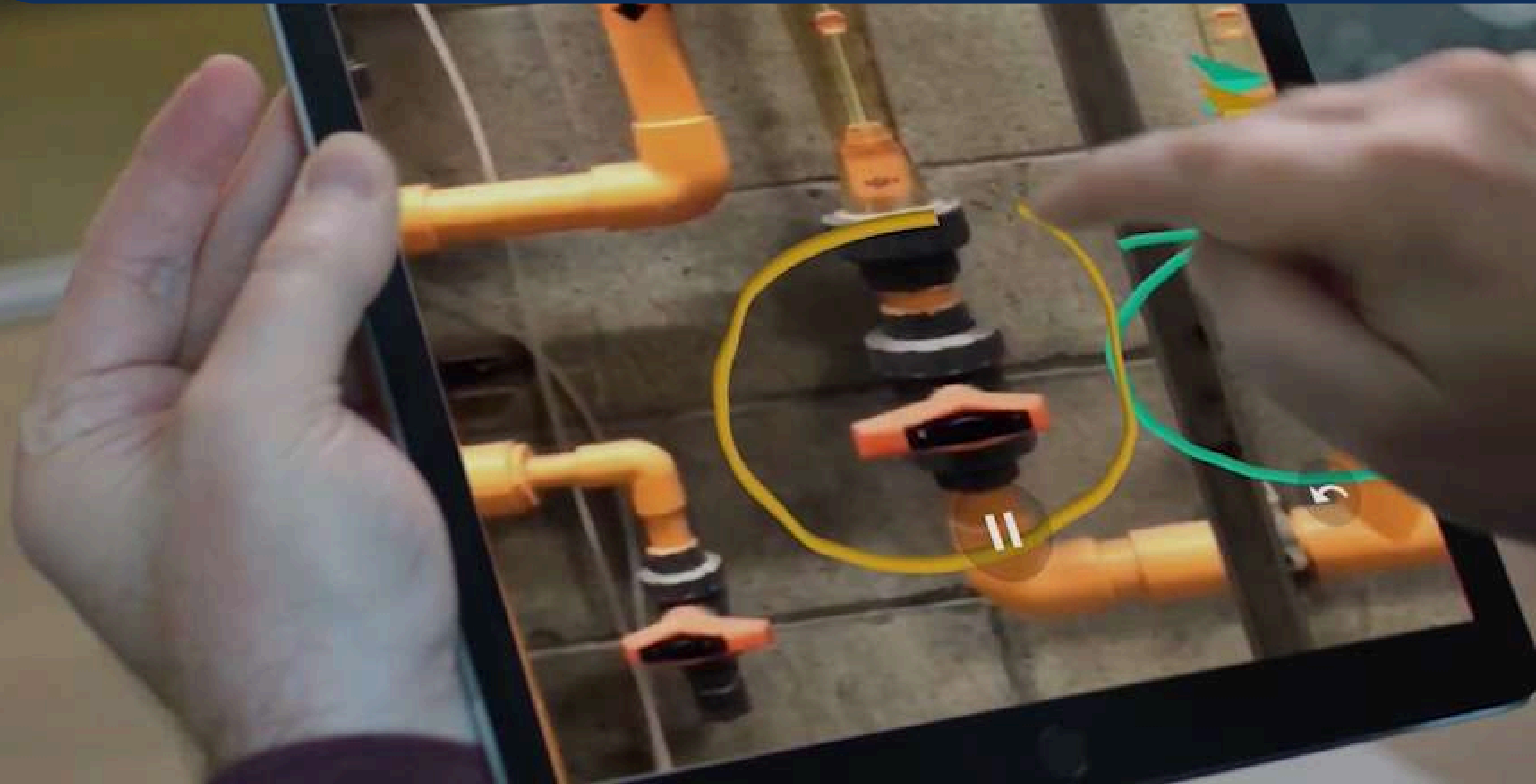
MAKEUP

FOR HOLIDAYS



YouCam Makeup lets users virtually try on real-life cosmetics

Vuforia Chalk is a simple but useful app in which you can share your screen with another person that can draw on your screen with augmented reality chalk marks that work like **visual annotations**, letting you find the right buttons, switches and controls, without the confusion caused by verbal descriptions





2014.09.01 07:55 PM



Sky Tonight is one of the best stargazing apps: it displays star names, constellations, planets and other celestial bodies in real time over the sky



Holo app allows insert holograms inside your photos or videos

VR, AR, Internet, Internet of Things (IoT) and Blockchain might also converge in the **Metaverse**: a network of interactive virtual worlds focused on social connections

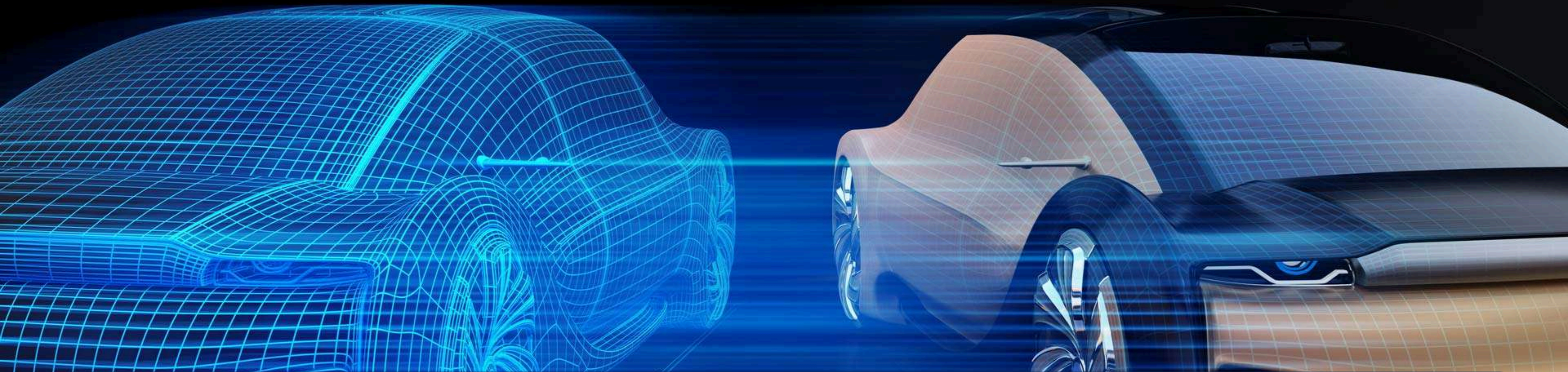


Metaverse is similar to **Second Life** platform, or **World of Warcraft** online game, or to the **Oasis** world of the "**Ready Player 1**" movie. **Facebook** bet so much on the Metaverse to rebrand itself as **Meta**



People will go shopping (paying with cryptovalues), meet their friends sitting around a table with them, go to work or school in virtual rooms, and even visit the doctor and play some sports together





In the Metaverse exists a digital twin not only of each person (*Avatar*) but also of many real-world objects. Access points for the Metaverse include not only VR headsets but also smartphones and PCs



However, truly **persistent** and immersive worlds accessible by **billions** of humans in **real time**, require an increase in computational efficiency of **a thousand times**

At present the Metaverse is still a hypothetical IT that is at least 10 years in the future. If realized, Facebook will probably dominate the Metaverse

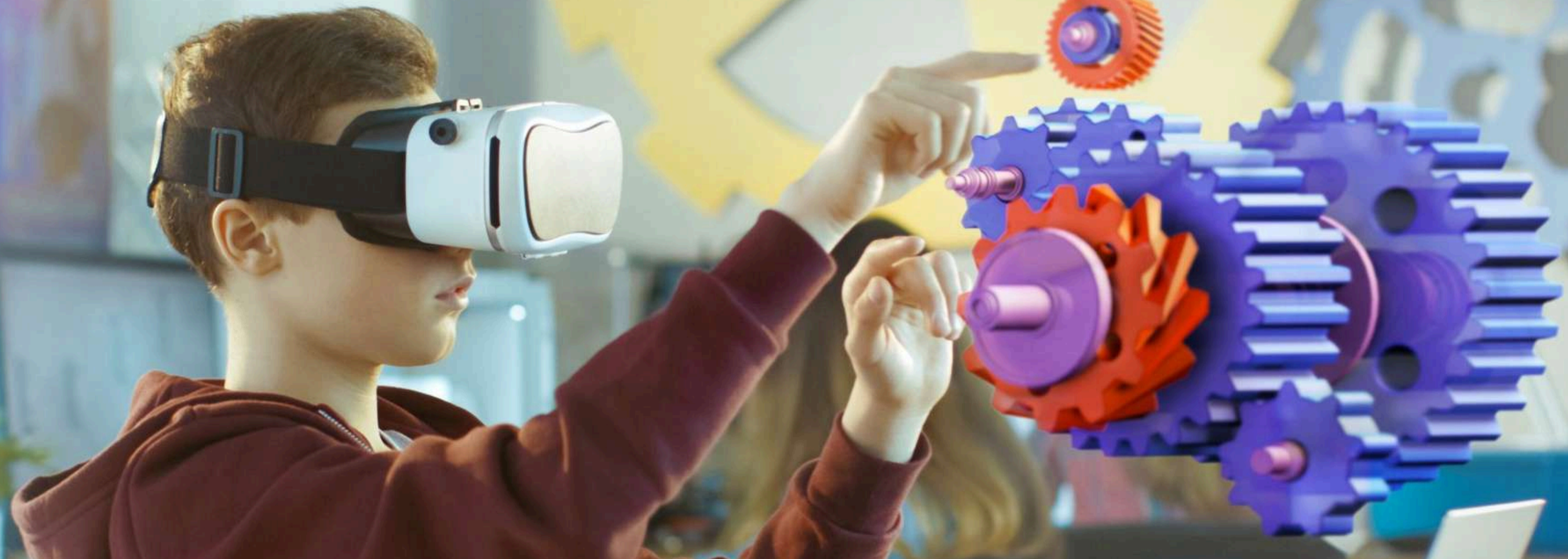


The impact of the Metaverse on tourism sector **will be small** because VR will always be used mainly for **marketing**, and not to **replace travel**: VR worlds will always be just a **surrogate** of the real world



Imagine a distant future where human minds are **directly connected** to the Metaverse: even this won't allow us to travel with the body, only with the mind: **true travels**'ll always be **beyond any computer simulation**





Metaverse might have a bigger impact on education: Facebook is testing the first Metaschools and Metaversities, virtual universities where the avatars of students and professors meet to have lessons in virtual spaces

RECAP

VR

- popular but expensive and **not yet widespread** (171 million headsets vs 7 billions people with a smartphone)
- in the tourism sector it is useful for **marketing**, to preview the destination

AR

- **widespread and easy to use**. Just less popular.
- in the tourism sector it is useful for **enhancing the touristic experience** (smart tourism)