KAMK • University of Applied Sciences

New Technology in Travel

2018

World at your Fingertips

Virtual reality brings the world straight to the customer. With endless possibilities, it is a growing tool to suppliment the travel market.

360° VIDEOS

Also referred to as immersion videos, 360° videos can enhance the customer experience in a visceral way by activating the senses and invoking an emotion response.

VIRTUAL REALITY

By adding the required hardware, virtual reality has the ability to fully immerse the customer in the experience. The VR headset has the added benefit of limiting outside distractions.

AUGMENTED REALITY

In augmented reality, the physical world combines with the virtual. The customer is presented with an engaging resource for information and entertainment that incorporates their surroundings .

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Endless
Possibilities

VR in Tourism

V I R T U A L R E A L I T Y

Without question, tourism is the largest industry in the world that attracts consumers from across demographics. For people who love to travel, getting away from home can be a meaningful and exhilarating way to de-stress from every day life. From climbing snow-covered mountains to perusing local art galleries, there is something for every one to enjoy. Finland, a country that has much to offer to the modern explorer, is no exception. Travellers have their choice of a city holiday filled with a wide variety of acclaimed museums, galleries, and shops, an outdoor nature adventure abound with breath-taking views and outdoor sports activities or a refreshing mix of both.

According to the Ministry of Economic Affairs and Employment of Finland, the total tourism demand was EUR 13,6 billion in 2016 with EUR 3,6 billion of that coming from foreign tourists. The tourism industry accounted for 2,5% of the GDP between 2011-2016 and has and will continue in an upward trajectory from there. Tourism is an important sector that has an impact on development of the economy. The main benefits of tourism are income creation and generation of jobs with 5,5% of all Finnish employment coming from the tourism sector.

It is no surprise that a large amount of time and money is spent on cutting edge marketing that grips the consumer and keeps them engaged. In the modern fast-paced society, it is ever important to stay relevant to the current demands of the consumer. The virtual reality experience has become the answer to the demands of the more tech-savvy desires of twenty-first century consumer. The VR industry is more than just a passing trend. With an expected market growth of more than 80% in the next three years, Forbes magazine has predicted that 1% of the world's population will own a head-mounted display by 2020. The ability to reach to directly reach the consumer is greater than ever. Be it through 360° videos, virtual reality experiences, or augmented reality interactions, the service provider now has access to more direct, powerful, and emotional tools. The possibilities are truly endless!

In this pamphlet, the different technologies will be discussed in more detail. The current applications of each will be presented along with the hardware needed to achieve the complete experience. For each available technology, there is a wide-variety of equipment over a varying range of cost. The cost/benefit ratio is an important factor for any service provider and the information contained in this pamphlet will aid in making the smartest decisions for your own business.

Time

With the right equipment and expertise, a 360° video shoot can less than a day. For the best quality, the footage should be edited and stitched together before being uploaded which takes extra time depending on the size of the project.

Cost

Costs can vary drastically depending on how ambitious the project is. For a simple 360° photo, a good quality smart phone is sufficient. Just like in 2d videography, there are more necessary elements in filming a video, such as lighting, sound, and post-production editing. This raises the cost drastically; often within the 10s-100s thousand range.

Benefit

It's clear that your audience is likely to respond better to your marketing efforts if they have immersive, 360° video content to interact with. Past projects have shown a notable return within weeks.

360° Videography

A SIMPLE TOOL

360° videos are a simple and cost-effect tool available to enhance the emotion connection between the customer and the product.

It is said that a picture is worth a thousand words. If this is true, imagine how much a 360° photo or video can say. Alone, 360° photos show a larger amount of detail and depth in any marketing material allowing for a more visceral and accurate reaction from the consumer. When coupled with a VR headset, the consumer can be fully immersed in the moment with little to no outside distractions. 360° videos have over a 30% higher repeated view rate than tradition videos and 70% of marketers who have used 360 videos say it has increased engagement for them.

Humans are hardwired to make decisions based on emotions and immersive videography creates an emotional connection between the content and the consumer as if they are present and involved. There are also great benefits for the more logical-minded since they can try the product before making an purchases.

As video technology improves and viewing equipment becomes cheaper and more accessible, more and more hotels, airlines, and tourism companies have started to veer towards 360 VR marketing. Those that have reaped the benefits such as increased interest, connection, enthusiasm and conversion. Online marketing is essential to any travel company because over 85% of leisure travelers consider the internet their main source of travel planning. VR grants companies to make the most of a customer's time and smaller, lesser known destinations often benefit the most.

VR travel apps can both help the customer experience a place—or a specific resort, city, museum, hotel or cruise ship—before they make any purchases. It has a larger scale effect on consumer choices, rather than using a standard destination description and tour itinerary. Consumers feel more secure that the product is the right choice for their needs and they also have a heightened confidence that they are getting the product that is being advertised.

Destinations, such as countries, towns and attractions, are also cashing in on the power of 360° videos by offering virtual tours. These tours offer a lifeline to those without the means to travel by enabling them to see the world from home. Additionally, they ignite an interest that leads to physical travel. The collaboration between Thomas Cook and Samsung Gear VR is one such example, offering the realistic presentation of Thomas Cook locations around the world. The endeavor brought in nearly £12,000 and a 40 percent return on investment within the first three months.

360° Videography

A P P L I C A T I O N S

Current applications to guide future marketing decisions

Every sector of the tourism industry has been able to find a successful application for VR technology. From hotels to museums, virtual tours have become an indispensible tool for attracting customers to choose one product over another.

The first decision any traveller must make is where to go. The world is vast and the choice can seem daunting. Using virtual tours, destinations, such as attractions, cities, and even whole countries, have been able to reach customers directly and show what they have to offer. One example of a successful marketing campaign here in Finland is the Explore Ateneum Art Museum. On the tour, one can take a close-up 360° look at many of the masterpieces on display and works with Chrome, Firefox and Safari browsers making it easy to use by the general public.

Hotels around the world, including Santa's Hotel Aurora in Luosto, offer 360° photos of their rooms so that the customer can see the room from every angle and be confident with their choice of accommodation. Some hotel chains, such as Best Western, have partnered with Google Street View to provide virtual tours of the entire hotel and the immediate surrounding area. YouTube is the most common host for the videos embedded on the advertising pages.

Airlines, cruise ships and railroads are not being left behind either. As example, Tallink and Silja Line cruise ships offer virtual tours of their ships and 360° views of many of their cabins.This summer, they also introduced an on-board VR tour of Turku's islands hosted by Galaxy. In the app, passengers can explore Lågskär Lighthouse, Vrouw Maria Wreck, and Seil's Church Parish.

1 Immersive photo of Times Square in New York City enables the viewer to feel as if they are really there with the use of any VR headset.

2 A 360° view of Santa's Hotel Aurora's glass igloo in Luosto provides great advertising for the hotel since the customer can see every detail and angle of the room before booking.

3 Ateneum art museum in Helsinki offers a virtual tour of the works of art exhibited in the main hall of the Ateneum Art Museum's Stories of Finnish Art -exhibition.

G A R M I N V I R B
3 6 0

Max. video resolution: 2880 × 2880 (x2) at 30fps | Stills resolution: 15MP | Battery life: 65 minutes
Price between 799€-869€

O R B I P R I M E

Available to pre-order for 399$

I N S T A 3 6 0
P R O 2

Price 6 000€

G O P R O
F U S I O N

Max. video resolution: 5228 x 2624 at 30fps | Stills resolution: 18MP | Battery life: 70 minutes
Price between 655€-765€

360° Videography

R E Q U I R E M E N T S

The proper camera is the most vital hardware needed when shooting a breathe-taking 360° film. As with traditional flat videography, the best approach is to first think about the content one wishes to capture, as this will determine which product is best for the job. The quality of the camera and the amount one is willing to spend will also affect the decision.

Professional 360 cameras usually have multiple lenses and several microphones for capturing 360 audio. The camera also comes with a gyro-stabilization system which uses modern electronic position data to correct for movements of the platforms they are mounted on to enable a high degree of stabilization. Cheaper, consumer 360 cameras can usually only shoot at a resolution of around 4K, where as camera designed for professional work need to shoot at around 8K to create a sufficient quality. Most professional cameras also have several other abilities not found in consumer 360 cameras like the ability to shoot constantly, live stream in high quality and shoot at a high frame rate.

Top rated cameras for 2018 include: GoPro Fusion (5.2K video resolution, 655€-765€), Garmin VIRB 360 (5.7K video resolution, 799€-869€), Insta360 Pro (4k@100fps and 8k@30fps video resolution, 3 990€), Vuse+ (4K video resolution, 960€), and the Nokia Ozo (8k video resolution, 23 500€).

Wearable glasses capable of filming 360° footage are a newly developed technology that may be a good choice for those hoping to capture the first-person perspective. Orbi Pro glasses (4K video resolution) are one such product that is currently available for pre-order for 399$.

Virtual Reality

What it means to you

Virtual reality can be defined as a technology by which computer-aided stimuli create the immersive illusion of being somewhere else. Exhibiting your product through VR is an interactive way for potential visitors to get a lasting impression once immersed in the story without even being there. With the power to dismantle barriers, access remote places, offer educational materials, and to connect people and different cultures, VR is a n ever growing industry with newer, better technologies being introduced at lightning speed. Additionally, research has shown that people were more likely to share their VR experience on social media and talk to their friends about it than with traditional tours.

> Virtual reality is a technology that could actually allow you to connect on a real human level, soul-to-soul, regardless of where you are in the world. – Chris Milk

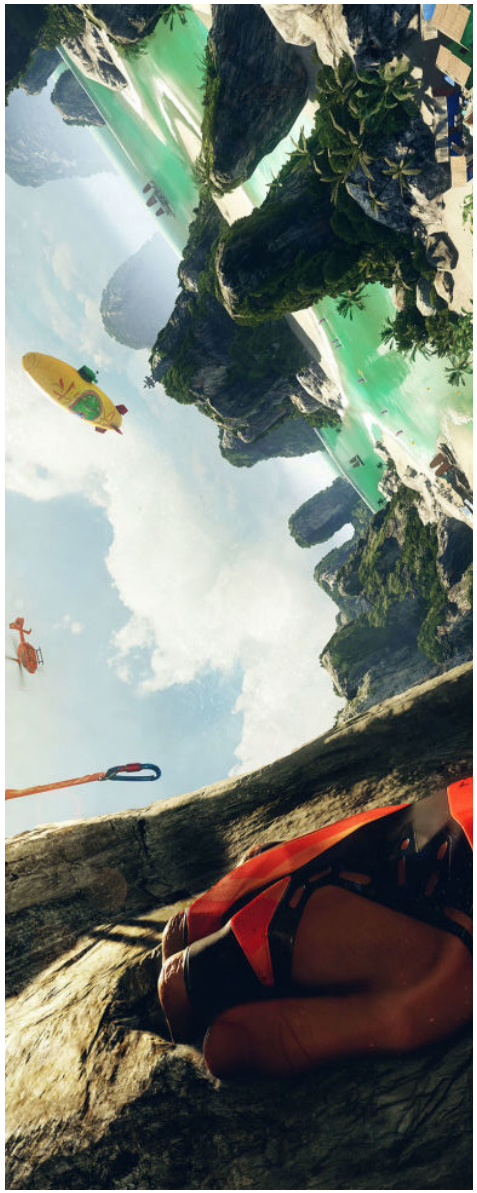
Travel apps allow travellers to see the world from home. Through collaborations with VR content creators and access to the appropriate hardware, travel service providers and destinations have been able to create amazing landscapes and interactive games that imprint a lasting effect on the viewer. Popular apps, such as Google Earth and Trek: Travel Around the World, bring the world to the user with multiple real world locations and interactive settings. There are even apps that grant access to hard to access or even off-limits locations; notably Everest VR and TheBlu.

Museums are using VR games to enhance the experience of their visitors by presenting information in enjoyable format. Apps, such as VR Museum of Fine Art, permit user to examine art more closely than ever disposing of all barriers between viewers and the pieces. Many other museums have utilized the technology by recreating the past in game format. One example being the Khronos House virtual reality environment at the Lönnström Art Musuem in which the visitor can explore the yard of the Khronos House of the past with VR glasses.

VR games can be employed as more than just a new way to present an existing exhibition; they can be the attraction themselves! From art exhibitions, such as Blanket Heavy With Nightmares at the Kajaani Art Museum, to VR rollercoasters, such as the Linnunrata eXtra at Linnanmäki, brings something current and exciting to the modern tourist.

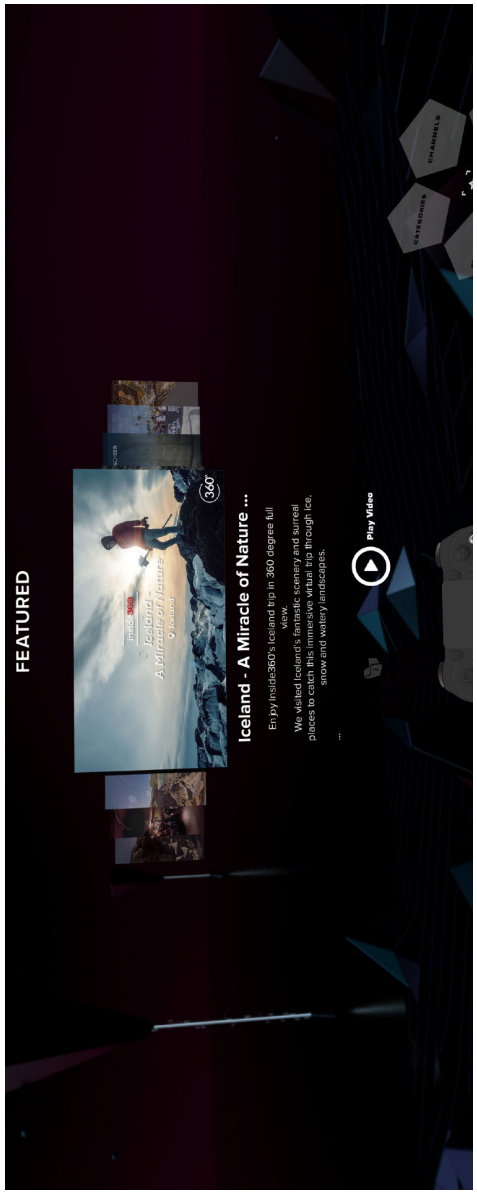
Beyond that, VR game centers are popping up around the world to great success and creating a new tourism market. True VR is the first VR gaming zone in Helsinki where customers can play for 30 minutes for 20€.

Of course, VR technology does have its' drawbacks. In addition to high prices, implementation can be tricky. While users are wearing the headset, they experience total blocked vision and require a free space for safe movement. Also, it is difficult to keep the headsets as clean as necessary when catering to a high volume of users.



Time

The time needed to create a successful virtual reality app or game varies depending on the complexity of the project. It can be anywhere between a month and years.



Cost

The cost is determined largely by the amount of man-power needed to complete the project. A simple app can be developed for as low at 10 000€, whereas larger projects can cost into the millions.

Benefit

Virtual reality technology maximizes customer engagements and enhances the customer-centric marketing methods, leading to fast returns.

True VR

A Virtual Reality room allows the user to move around with a fair degree of freedom, which more closely replicates a real-world experience.

"As we explored the idea of travel in VR, we realized that a destination is never a place, but always a new way of seeing things, an emotional experience. We used VR to infuse the magic of Finnish destinations into a captivating experience. ", says Michael Zaidan, Creative Director of MinorityVR.

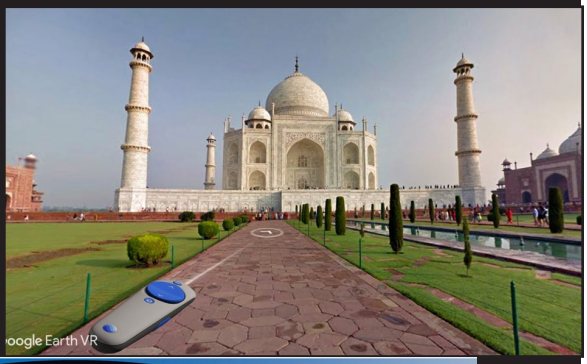
Kajaani Art Museum

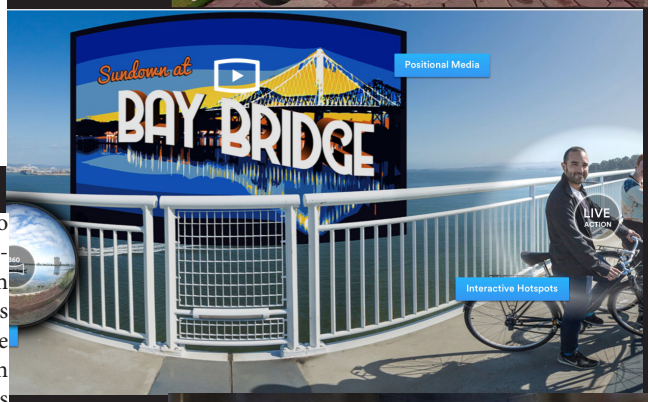
Artist Suvi Solkio is experimenting with the VR experience developed with Tarinat Peliin, based on Suvi's work Blanket Heavy With Nightmares

Virtual Reality

A P P L I C A T I O N S

A smart business model includes the latest technology

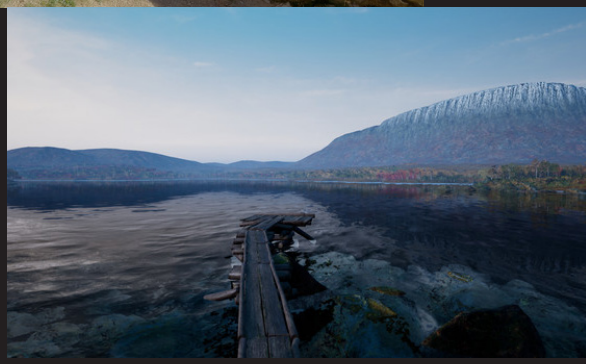




A site with a virtual tour and interactive media can expect to receive 40% more views and 750% more time of customer engagement than with a competitor's site that is lacking such media. In this section, we will explore a variety of successful applications of VR technology in order to aid in making decisions about possible up-coming projects and capitalize on VR's profitability. We will do this in three parts: travel apps, apps created by service providers such as airlines and hotels, and VR games hosted at attraction venues.

The only thing you need to roam the globe these days is a good VR headset and an app. There are many options on the market and here are the top 5 most relevant examples below:

- Google Earth: Explore the whole world from above with satellite imagery, 3D buildings in hundreds of cities, and 3D terrain of the entire globe. Zoom to your house or anywhere else, then dive in for a 360° perspective with Street View. Set off on a unique adventure by rolling the dice and hopping between random locations. And see the world from a new point of view with Voyager guided tours from BBC Earth, NASA, National Geographic, and more. Software developed by Google LLC.
- YouVisit VR: YouVisit combines the power of Aria, an enterprise platform that enables brands and organizations to engage and convert audiences through interactive 360° experiences, with an award-winning production studio to drive measurable results for over 800 clients across mobile, desktop, and VR. Software developed by YouVisit LLC.
- Jaunt VR: Though not specifically a virtual reality app for travel, but it promotes incredibly detailed and high quality videos of the most popular exotic destinations and landmarks, such as Machu Picchu, Nepal and Jerusalem, among other VR experiences. Software developed by Jaunt, Inc.
- Realities: Realities brings real world locations into VR - interactive & with stunning photo-realism using photogrammetry. Too many amazing sites are too far away, too expensive to get to, closed off to the general public or too dangerous to visit. Explore those places and discover their stories. Software developed by realities.io inc.
- Trek: Travel Around the World: Experience a total of five real-world locations, varying from Finland to India! Watch as magical phenomena blend with each destination visited in VR. Slip on your headset and trek around captivating environments! Software developed by Minority Media.



Virtual Reality

APPLICATIONS

Once a traveller has decided on a destination, he or she must then consider the logistics of travel, ie. how to get there and where to stay. The market is flooded with options and it is increasingly important for companies to stand out.

Not a company to be left behind, Finnair debuted a VR experience marketing their new Airbus A350 fleet at Slush in 2016. The experience was created by VR content creation firm There is No Spoon and was designed to show off the features of the new aircraft in an unforgettable way by simulating flying through the sky on the wing of the plane. This marketing campaign has had widely positive feedback since it adds a memorable sensation to the presentation information.

The benefit of adding an element of entertainment to the more mundane aspects of travel was likewise noted by hotel chain Marriot. They started to place virtual reality headsets in their hotel rooms, which allowed users to experience traveling to different locations. Created in collaboration with Samsung Electronics America, "VRoom Service" is a first in the travel industry and has had a great return with 51% of their customers who used the VR experience said they wanted to stay at Marriott hotels more often.

Norwegian Cruise Lines have launched the luxury cruise ship "Joy" in 2017. The ship boasts an immersive VR arcade called the "Galaxy Pavilion" including simulations of rides and interactive video walls. The virtual reality experiences uses Oculus Rift headsets and simulators.

"Finland is known for technology, innovation and our heritage of Nordic design – as well as currently being one of the hottest travel destinations in the world.", says Johanna Jäkälä, Vice President, Brand & Marketing at Finnair.

Attractions around the world and right here in Finland are using the draw of VR to increase visitation by adding an addition element to what is already offered.

With the growth of VR options and availability, museums and historical sites can offer more than just virtual tours. Gamification is the application of game-design elements and game principles in non-game contexts and has become an excellent way to connect with an audience. Clever Simulation Entertainment, based in Kajaani and operationg as part of the Kajaani University of Applies Sciences, designed Raatihuone, a game for the Kajaani town hall, in which the player travels through time solving puzzles that pertain to the history of the town hall. Players learn about the site in a fun, interactive and, most importantly, memorable way.

Museums, galleries and amusement parks are no longer the only way for a tourist to spend their time in the city. Smaller entertainment venues that cater to a more specific adventure have been growing in popularity in the past decade. Escape rooms have become especially popular so it is only logically that they too have taken advantage of VR technology. Escape Room Helsinki currently hosts two VR escapes, Cosmos and Dark Mind. In the VR escape room games, the player will use the most modern, fascinating devises to move in virtual space, while solving puzzles with their hands and discerning minds.

VR game spaces have been popping up all around Finland as well. These new venues have become popular with both locals and with tourist from out-of-town. In addition to True VR (Helsinki), which has already been mentioned, Portaali VR (Tampere), Cybernet VR game hall (Turku) and VR Haven (Oulu) have been met with larger customer turnout, nice returns, and positive reviews.

Yi Halo

A professional VR camera that combines high fidelity capture with versatility of use and robustness.

Nokia Ozo

With a price point of 23 500€, it is best suited for corporate or professional use.

Virtual Reality

R E Q U I R E M E N T S

What hardware is needed for creating VR content

A virtual reality specific 360° camera is different than the average 360° camera on the market. 360° cameras, while they can produce photos and videos that can be viewed in a virtual reality headset, still output traditional 2D images. VR cameras differentiate themselves by creating a sense of depth with recorded footage in full 3D, deepening the sense of immersion and transporting the view into the new world.

With that in mind, what are the best VR cameras out there and how do they differentiate themselves? Explained below are the top 5 cameras currently on the market, each offering something a bit different to their customer.

- Nokia OZO: The camera features eight video sensors that capture 45 minutes of 360° footage at 30 frames per second, synchronized with eight microphones for recording 360 x 360 surround sound. The Ozo is an incredibly innovative camera system that has an array of accessories that help add to the video-making experience. (23 500€)

- Yi Halo: The system has 17-cameras capable of shooting stereoscopic video in 8K resolution at 30 frames per second, or 5.8K at 60 frames per second. The rechargeable battery lasts over 100 minutes during continuous shooting. It was built to work with Jump, which is a high-end VR creation platform that Google launched in 2015. ($17 000)

- Insta360 Pro 2.0: It has 6 HD cameras capturing 360-degree video at up to 8K resolution. Additionally, it offers additional FarSight technology which uses a dedicated transmitter and receiver in order to monitor the action from up to 300m away and FlowState stabilization. The unit sports a5100mAh removable battery with 75 min of endurance. (6 000€)

- GoPro Omni: It works with six HERO4 Black cameras and comes with six 32GB microSD cards and a controller. It captures video up to 8K resolution at 50fps. Battery has a life of around 45 minutes of active use. ($1 400)

- Mini Eye 4: Made by 360Designs, the fully spherical professional 360 video rig has 4 cameras for increased overlap. It is capable of capturing video at either 3K or 6K at up to 60 fps. ($12 000-17 000)

High quality at varying prices

1. Yi 360 VR (500€) 2. Mini Eye 3 ($13000) 3. Insta360 pro 2.0 (4000€) 4. Z Cam s1 ($1700) 5. Samsung Gear 360 (140€) 6. Orah 4i ($3600) 7. Pro6 Bullut 360 ($3000) (listed from top to bottom)

Virtual Reality

REQUIREMENTS

With a headset and motion tracking, VR lets you look around a virtual space as if you're actually there. Modern VR headsets fit under one of two categories: Mobile or tethered. Mobile headsets, such as Samsung gear and Google Daydream, are stand-alone systems into which you place your smartphone. They are easier to transport and use since they don't require a computer. The downfall is in their quality and motion tracking accuracy when compared to the pricier tethered models.

Top headsets of 2018

M O B I L E

High Quality VR platforms for mobile and stand-alone devices

- Samsung Gear (130€): Pro: A Bluetooth controller equipped with both a touchpad and motion sensing. A large number of games and apps due to a collaboration with Oculus. Con: Not compatible with a large number of mobile devices.
- Google Daydream (80€): Pro: Comfortable light design for a low price. Con: Small number of games and apps available.

T E T H E R E D

When coupled with a PC with large computing power, these headsets host a complex experience.

- Oculus Rift (480€): Oculus Rift was the first big name in the current wave of VR, and Oculus still a major player. Package includes a headset, two Oculus touch controllers, and two motion sensors for defining a large area. With a resolution of 1,080x1,200 (per eye) and a Oculus software platform, it is a great choice for gamers.
- HTC Vive (690€): Package includes a headset, two motion controllers, and two base stations, called Lighthouses, for defining a "whole-room" VR area. With a resolution of 1,080x1,200 (per eye) and a SteamVR software platform, it is a great choice for gamers.
- HTC Vive Pro (1 600€): Headset offers a higher-resolution display (1,440x1,600 (per eye)), outward-facing cameras, and a handful of other enhanced features than the regular Vive, but it costs around 1 000€ more than the HTC Vive
- Playstation VR (200€): Polished and easy-to-use with a variety of PS content, packages are available that contain the headset, PS camera, and two move controllers. With a resolution of 960x1,080 (per eye), this system is a good choice for Playstation owners.

S T A N D - A L O N E

Untethered without the need of a compatible smartphone.

- Oculus Go (280€): An easy and inexpensive way to dive into VR. The refresh rate is slower than other headset due to lower processing power but it still has a resolution of 1,280x1,440 (per eye). It hosts an android software platform.

Virtual Reality

REQUIREMENTS

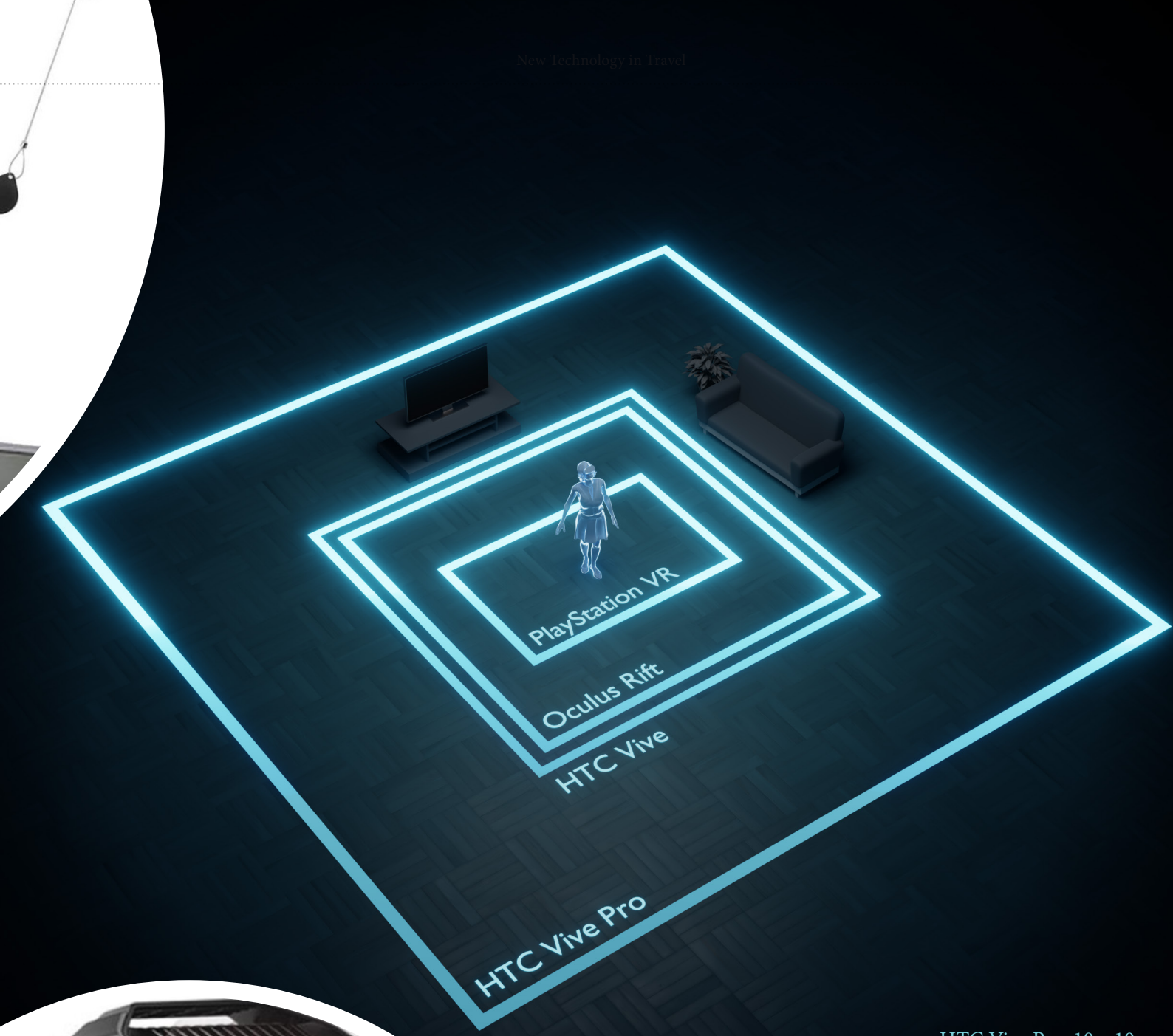
Some addition requirements to make a VR space possible.

In addition to having the virtual reality headset, a high-powered computer is needed to run the software smoothly. Processing visual presentation for the users requires a high-end computer with a good graphic adapter. This makes sure that the graphic details for the users are good enough and that the frame rate is smooth enough to prevent simulation sickness caused by lagging images. The Oculuc VR, the developers of such products as Oculuc Rift, have recommened the following computing specifications:

- Intel i5-4590 equivalent or greater
- NVIDIA GTX 970 or AMD R9 290 or greater
- 8GB RAM or more
- HDMI 1.3 and 3x USB 3.0 plus 1x USB 2.0
- Windows 7 64 bit or greater

All the leading virtual reality glasses provide the option to track the movement of the users using differing sensor system. To utilize this feature to enhance play, the user is requiresd to set up a play area and remove all possible obstacles and objects inside this area. There are some differences between the different VR headsets, with a varying amount of movement space being offered.

The users movement is also limited due to the fact that most virtual reality headsets are still connected to the computer with cords. Although having the cords on the floor is one option, setting up a system that makes the cords hang from the ceiling prevents a lot of problems of the users getting tangled in the cords or tripping over them. Some newer systems and additional upgrades to older systems already offer wireless options, but these systems still have the problem of short battery life.



HTC Vive Pro: 10 x 10 m
HTC Vive: 5 x 5 m
Oculus Rift: 4,5 x 4,5 m
Playstation VR: 3,0 x 1,9 m

1 Retractable VR cord management systems, such as the Kiwi Design model pictured above, make play areas safer and less cumbersome for the users.

2 The play area size varies depending on the brand of headset system being used.

3 The Aurora is the best Alienware PC for most VR enthusiasts because the VR-ready configurations start at about 2 000€, and inside you get everything required for a great VR experience

Augmented Reality

A MIXED VIEW

Augmented reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. AR in tourism has a great potential to enhance travelers' experiences. New AR mobile apps provide useful information, navigation, guides, and translations.

Time

AR projects can be really quick to create, but the amount of time needed is heavily related to the complexity of the project and functions that the AR software includes, varying from few weeks to years.

Cost

The cost is determined largely by the amount of manpower needed to complete the project. Some simple applications can be done with little training by own personnel with dedicated software, and production costs for a simple app range from under 5000 € to hundreds of thousands.

Benefit

Augmented reality applications can provide the users a completely new and interesting way to experience their surrounding and gain useful information, and provide a new additional layer to their travel experience.

Augmented Reality

APPLICATIONS

The four major sectors of the tourism industry, namely accommodation, transport, catering, and tourist attractions, have all found used for AR technology even as it is still being developed. Apps are being use in two ways: as a way to overlay information over the real environment and as a method of gamefication to increase the entertainment value and increase repeat visitation.

Overlaying information about the surroundings in an incredible tool for a tourist. Using a travel app with AR, a traveller can point at the transportation object to get direction, route, next stop and places of interest, removing so much of the fear from travelling abroad. For foreign travelers especially this could be quite enjoyable during their trips. With AR, a metro map can into an interactive guide in multiple languages. The Tunnel Vision app for the New York *City metro is one such example that has been praised for its' helpfulness.

Hotels, such as the Hilton, have introduced easy to download and use apps that interface with their rooms and surroundings to create tours with accommodation details, prices, and amenities. Furthermore, Marriott Hotels have collaborated with Blippar to produce such interactive ads in their magazine to attract younger customers.

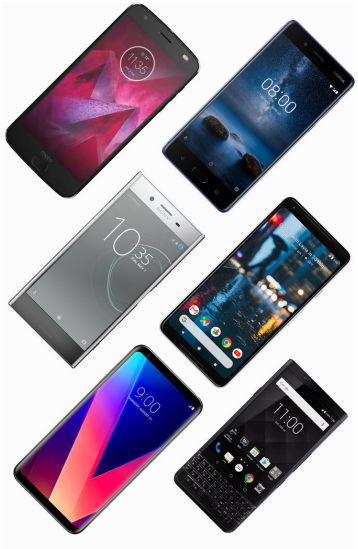
Restaurants have similarly used overlay information apps for their menus that provide ingredient and nutrition information, which can be very useful when traveling in a foreign-speaking country. Restaurants have also capitalized on the gamification aspect of AR by making their business a pokestop in the popular mobile game Pokemon Go and luring in customers that way.

Gamefication is a particularly attractive option for attractions. Be it by making advertisements more appealing or by adding an interactive element to an exhibition, customers are more likely to visit and become repeat customers though the engaging quality of a enjoyable, visual and interactive activity,

In Finland, VisitFinland launched a marketing company last year utilizing AR technology and features the culture symbol of Santa Claus. The project is conducted together with a Finnish AR/VR company Robust North using their mobile app Arilyn. The app is free and available on the App Store and Google Play.

GLASSES AND HEADSETS

1. Meta 2 ($1 500) 2. ODG R7, R8 and R9 Series ($2 000-3 500) 3. Microsoft HoloLens (3 300€).



SMARTPHONES

Most popular option due to their availability and low cost

Augmented Reality

REQUIREMENTS

The most popular viewing devices for AR are simply smartphones and tablets. They are usually comprehensive in their producers featured with similar/comparable hardware components and have been used as platforms for AR-Apps for a long time, due to the wide spreading among the end user market.

AR glasses and headsets are a relatively new product. AR optimized Smart Glasses usually not only contain their own processor and the corresponding energy supply, but also complex hardware and software to recognize and analyze the real environment and the possibility to play visual and auditory data of digitally added impressions over the real world (looking through the glasses, the user can see the real environment together with virtual additions).

- Meta 2: This headset needs to be tethered to a computer. Specifications are a 90-degree field of view with a 2.5K resolution and a60Hz refresh rate. The set includes hand interaction & positional tracking sensors, a720p front-facing RGB camera, 4 surround sound speakers and 3 microphones and costs $1 750.
- ODG R7, R8 and R9 Series: Glasses feature 720p lenses that are 80% transparent and can show video at 80fps with a 37/40/50 degree FOV respectively. As well as a 4MP camera, there's voice recognition, Wi-Fi, Bluetooth and a whole bunch of gyroscopes, magnetometers and accelerometers inside. The price ranges from $2 000-3 500.
- Microsoft HoloLens: The headset boasts 2 HD 16:9 light engines, automatic pupillary distance calibration and a holographic resolution of 2.3M total light points. With 4 environment understanding cameras, 1 depth camera, 1 2MP photo / HD video camera, 4 microphones, and 1 ambient light sensor, is the leading choice for 3 300€.

3D-Talo produces virtual and augmented reality-based software and services, which grant businesses far-reaching benefits. They also provide laser scanning, photogrammetry and 360 photos and videos.
With these technologies, They create whole new worlds or turn the existing ones into a digital form. The newly crafted realities are used for wide variety of creative purposes.

3rd Eye Studios is a collection of technology, movie, TV and game industry veterans building atmospheric and sophisticated games, and groundbreaking technology & tools for game developers.
Studio was founded in June 2016 by a group of game industry veterans, who previously worked in senior positions at companies like Remedy Entertainment, Unity Technologies, Bugbear Entertainment, RedLynx and Moon Studios.

Arilyn is an Augmented Reality company focused on delivering the best tools for virtual storytelling. With Arilyn platform the professionals in marketing, media and entertainment can create the ultimate Augmented Reality experiences to engage their target customers to enjoy the wonders of this new media.
Arilyn offers both mobile application for enjoying the experience and the back-end portal ArilynManager for professional use. Arilyn mobile application is available for free from AppStore and Google Play. ArilynManager is available for license for B2B customers.

Clever Simulation Entertainment is a game development team that operates within the Kajaani University of Applied Sciences (KAMK). They specialize in serious games and VR and AR development. At Clever SE , the main focus has been to create custom design VR environments for companies, schools and differrent institutes using the latest technologies, such as photogrammetry and laser scanning for faster content creation.

CTRL Reality is a company specialized in the production of state-of-art mixed reality solutions and platforms. The company improves their customers' performance with the emerging technology by developing applications for mixed reality headsets as well as for mobile devices. They aim to be the company with the most satisfied customers and the happiest employees.

Local Sources

F I N N I S H R E S O U R C E S

No need to look far for a firm that meets for requirements.

Fake has an experienced VR/AR team. The VR/AR team designs, develops and produces immersive, interactive VR and AR applications for communication, training, collaboration and entertainment.
They specialise in collaborative multi-user VR/AR solutions. Multi-user enables different advanced collaboration, training, decision making and entertainment solutions.

Finwe Ltd. is a Finnish software company that was founded in 2006 by a group of research scientists. Finwe focuses on mobile software and applications that require high-quality sensor algorithms, 3D graphics, and video technologies.
Currently, Finwe specializes in 360 VR video presentation and created about a hundred apps for global brands such as Warner Music, MTV, BBC, Intel, McDonalds, Subaru and Lexus; their own 360 video ren-

flyAR® Augmented Reality Studio Oy is a content creation Studio specializing in interactive and three dimensional Augmented Reality -experiences. The company was founded by friends and digital media engineers F. Tihveräinen and E. Salminen.

Make Films makes finely crafted and carefully considered films that tell your story. they understand and embrace the complexity of the modern company or brand. It's a story that has people, products, process and identity at its heart. Learning about your company, thinking about your story, crafting these strands into strategy or films that inform, excite and compel the audience. 'This is what excites us, this is what we do!'

Softability is innovative and growing Finnish software development company located in Vantaa. We design and implement smart and user-friendly digital applications for industrial and medical device manufacturers as well as construction businesses. Our Softability Studio team develops Augmented, Mixed or Virtual Reality applications for mobile platforms, smart glasses and Microsoft HoloLens devices.

Stereoscape uses augmented, mixed and virtual reality – along with 3D and interactive technologies – to transform the way products are communicated. Their smart product communication solutions enable new, effective forms of interaction between people, products and product data. Their clients benefit from new opportunities to save costs, improve productivity, engage customers and drive growth.

There's No Spoon is a full stack Virtual Reality company located in Helsinki, Finland.
The company consists of experts with several years of experience working in film, advertising, post-production, and technology. They create high-end immersive VR & AR experiences and Cinematic VR productions.

TouchDown Creations creates immersive (VR/AR/MR) experiences and games through technology. We specialize in UX/UI Design and Optimization of AR and VR, Graphics, Video Media and App Design and Development, but we're continuously growing as we learn new skills and technologies. We have been working with Games, Education, Marketing, Video, hardware and Software.
Selling Usable Clean AR/VR media experiences. They create media experiences. TouchDown Creations is based in Helsinki Finland, which is famous for its design.

Local Sources

FINNISH RESOURCES

No need to look far for a firm that meets for requirements.

Valakia Interactive is advertising agency located in Seinäjoki, Finland. We specialize in augmented and virtual reality applications for marketing and education.

Virtual Dawn is a game studio from Tampere, Finland that focuses on VR game development and other VR/AR projects.
Besides VR, they also have a wide range of experience in producing breathtaking computer generated graphics for more traditional mediums such as television, movies and games. They offer consultation services to help you obtain all that is needed to create such high level visual quality yourself.

Vizor is a platform for exploring, creating, and publishing virtual reality on the web. Discover 360 and 3D content in VR on your phone, or in 2D on your web browser or tablet.
Go one step further and create and share your own with 360 photos, sound, images, and your own 3D models.

ZOAN creates interactive digital environments that allow your customers to experience, do and learn. Digital Buildings, marketing and entertainment. Their clients include international and domestic companies, e.g. Nokia, Petrobras, ITAU, Varma, Ilmarinen, VR and Alma Media Digital Building.
Create a cost-effective, training-scheme that can be used regardless of the time and place. Experience real life situations that would otherwise be too dangerous to train in or too expensive to organize.

VR/Travel

KAJAANI UNIVERSITY OF APPLIED SCIENCES