WHITE BOOK ON

VIRTUAL REALITY APPLICATIONS

STORY**LIVING**

N O T

STORY**TELLING**

Interreg
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I. INTRODUCTION

STORYLIVING NOT JUST STORYTELLING

Virtual Reality (VR) opens new horizons for storytelling, taking it to a higher level - storyliving. Since ancient times, people have been communicating with each other by telling stories. Today, the traditional approach to conveying a particular message is through narrative, photos or video content. In this case, however, the information consumer is only a passive observer. Virtual reality enables the viewer to be transported inside the story itself. It fundamentally changes the traditional concept of narrative, making it much more emotional and impactful.

Virtual reality is a powerful tool for recreating stories and creating experiences that are unattainable in any other way.

Through VR, we "transport" the viewer to another reality, to a different world. The goal is to achieve total immersion.

This creates new and exciting ways for people to interact with media content, allowing them to be not just passive observers, but active participants.

Virtual reality is the closest thing we have to teleportation. It enables us to transport the viewer anywhere - to a real place or even to another world and another time, or to make them witness events they could not attend.

WHAT IS VIRTUAL REALITY (VR)

Virtual reality is a tool that is increasingly developing and gaining popularity, especially in the fields of business and manufacturing, marketing and advertising, art, culture, science and education, and not least entertainment.

Generally speaking, virtual reality is a digitally simulated environment - captured or computer generated.

We can immediately recognize VR by the use of virtual reality headsets (HMD - head mounted display), although this type of content can also be viewed through traditional computers and smart devices. VR headsets, however, provide a so-called immersive experience, unattainable with a traditional user interface.

Specialised equipment, computer technology and software are needed to create VR products. They put the viewer inside the virtual world itself, rather than in the role of a bystander in front of a limited screen.

TYPES OF VIRTUAL REALITY

360 degree video (fig. 1)

fig. 1

So-called spherical video, where the viewer has a view in all directions simultaneously. Creating this type of content requires the use of a specialized camera that has a number of lenses to cover a 360-degree view. The goal is to fully "immerse" the viewer in the experience and create a sense of real presence.

Computer generated virtual reality

A three-dimensional computer-generated environment in which the viewer can safely move and interact with the elements within it (fig. 2).

fig. 2

"DEGREE OF IMMERSION" IN VIRTUAL REALITY

There are several degrees of impact of the content on the viewer:

Semi "immersive" virtual reality

In this type of virtual reality, the user can observe a virtual environment using a computer screen or virtual reality headset, but other than the visual experience, there is no interaction with the environment to make the experience more realistic.

Thus, familiar virtual tours are a good example of a semi "immersive" virtual technology. In contrast, VR movies are the highest level of semi "immersive" content, as they are not just static footage, but complete stories supported by narrative, dramaturgy, sound design, etc. Thus, one feels part of the environment, but cannot influence it with one's actions.

Fully "immersive" virtual reality

They provide a realistic virtual experience in which the user feels as if they are physically present in the virtual world and part of the events taking place there. The user can interact with the environment, influence it and, depending on the equipment, have physical sensations(fig. 3). Special equipment is needed, such as VR headset, gloves or specialized clothing with sensors that mimic the sensation of interacting with the environment - such as touch, shock, heat, etc. (fig. 4).

fig. 3
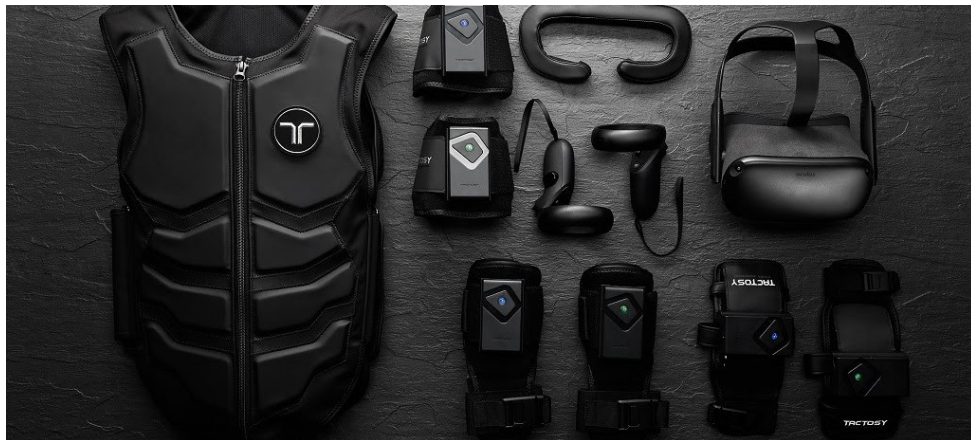
fig. 4

HOW TO ENJOY VR?

The most accessible option for viewing VR content is through a computer, tablet or smart device. In this case, however, the feeling of "immersion" in the environment is missing.

Cardboard VR glasses, the "Google Cardboard" type, are a very affordable option. A smartphone can be put in them and VR content can be viewed, but with a compromise in quality.

The most impactful way is through professional VR kits. The quality is very good, but the price is higher.

II. FIELDS OF APPLICATION

Virtual reality is a technology that nowadays is increasingly used in various spheres of life and business.

In the last decade, the number of companies integrating VR into their production and project activities, in human resources and especially in marketing has increased sharply. Public and non-profit organizations are also turning their gaze to this technology, incorporating it into the promotion of their activities.

In the following lines, we will tell more about where it is used, what its advantages are and why it is only a matter of time before technology becomes a necessary part of our daily lives.

1. CORPORATE AND PRODUCT PRESENTATION

VR is a very suitable tool for presenting companies their working environment, production processes and facilities, key or specific activities, specific products and services. Corporate and product VR/360° video presentations impress customers and partners, and quickly gain their trust.

VIRTUAL REALITY TO PRESENT A COMPANY OR PRODUCT

Virtual reality has many more advantages than product or corporate presentations created on printed media or through PowerPoint presentations. VR presentations are more interactive, interesting and engaging, which inevitably leads to a higher level of engagement from viewers/participants.

The range of potential applications of virtual reality is endless and adaptable to the specific case and objectives. For example, a virtual tour of a company's facilities could be created or its products and services could be shown in action, with the potential customer at the center of the experience. This approach is highly suitable during exhibitions, festivals and other types of brand promotion events.

In addition, VR presentations can be viewed on a wide variety of devices, such as virtual reality goggles, phone, tablet or computer, making them accessible to a wider audience.

ADVANTAGES

▸ Innovative approach for presenting the themes and messages a company aims to reach consumers;
▸ Ability to shorten the distance with customers and partners and build a more emotional connection;
▸ Opportunity for the company to stand out in the market and develop and consolidate its image as an innovator.

CHALLENGES

▸ A company or brand to present itself as interestingly and impactfully as possible;
▸ Conveying the desired messages as effectively and understandably as possible;
▸ Build brand loyalty and engagement.

APPLICATIONS OF VIRTUAL REALITY IN CORPORATE AND PRODUCT PRESENTATIONS

COMPANY PRESENTATIONS

Presenting a company in VR/360 panoramic video is a modern advertising approach that provokes the senses and minds of customers in a new way. Placed in the real company environment, they have the opportunity to view details, read and hear key information, "touch" products, "feel" the atmosphere and emotion. All this attacks the mind in a different way, impresses strongly and forms a lasting memory.

RECRUITMENT

Employees, who with their skills and competences will raise the level of work, and respectively will bring profit in the future, are a priority for every company. In order to attract quality human resources, it is important how attractively the company "sells" itself on the personnel market.

Virtual reality is an excellent tool in this respect. The potential employee "enters" directly into the environment, sees his future colleagues in the process of communication during work and rest, the advantages of the office environment and the overall atmosphere. VR strengthens the motivational element in times compared to traditional promotional video presentations (fig. 5).

EMPLOYEE TRAINING AND COMPETENCY ASSESSMENT

VR is used to create interactive scenarios that reflect in detail real life situations - routine or emergency, situations where skills are trained, knowledge is built upon, role plays are entered, trainees are tested and evaluated. One of the great advantages of technology is that it can recreate dangerous scenarios in a safe environment, testing attitude and coping and teamwork skills (fig. 6).

In addition, VR saves companies time and serious expense. With the help of this technology, HR departments create virtual templates for ongoing assessment of employee competencies, minimizing on the one hand - the subjective factor in the evaluation and on the other - the embarrassment of the person being evaluated in a real environment.

Placed in a VR environment, the appraisee navigates perfectly while being isolated from external factors, which increases concentration, gives peace of mind and confidence. His or her orientation time, attention and interest 'scores', handling of the situation and responses are automatically generated in a database that is available to HR professionals for analysis and evaluation.

Presentation of a product prototype

Virtual reality allows for better visualization of a product. It can be precisely designed, analyzed and repeatedly modified if necessary before going into production (fig. 7).

Virtual reality is very "useful" at the initial stage of a product's development, when it is important for expert decision makers to get analytical feedback as well as the end users' opinion on the product's design, functionality and design flaws, avoiding complications during and after production.

HOW TO INCORPORATE VIRTUAL REALITY INTO YOUR CORPORATE STRATEGY:

Create 360-degree video content

In today's dynamic and higher competitition, we need to present ourselves in a way that makes us stand out in a sea of advertising, messaging and traditional activity. Creating a high-quality VR presentation of a company, brand, product, service or even employer brand, and implementing a tailored conceptual campaign (fig. 8), will have an unparalleled positive effect on customers and partners. This type of campaign can be a combination between a VR presentation and experience and a "making of" traditional video that has the potential to become extremely popular across all online channels, giving the campaign great visibility.
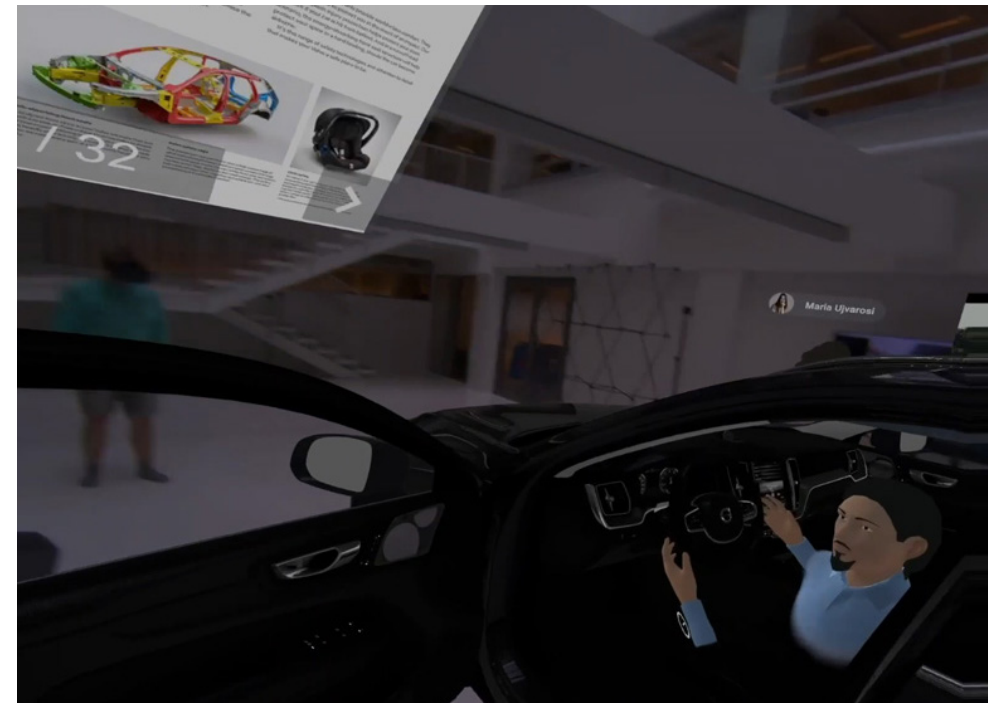
fig. 5

fig. 7

fig. 6

fig. 8

"The different" corporate gifts - branded cardboard VR glasses (Google cardboard type)

The attention of the younger generation cannot be attracted by promotional keychains, pens or mugs. VR glasses made of cardboard are the most suitable promo gift because they have the longest lasting "wow" effect. And not only do they allow potential customers to be entertained with a different and immersive experience that has been created for them, but they can also be used by consumers to watch 360-degree videos on YouTube (fig. 10).

VR presentation at trade shows and events

Virtual reality headsets are still a relatively new concept. It's increasingly being heard about, maybe seen on the internet or in the media, but how many people already tried it? Setting up a dedicated space - a demo booth at events or your own mobile VR booth, are excellent ways to get people's attention and engagement. This will, also, provide excellent additional content that brand followers on social media and internet platforms will be able to monitor (fig. 11).

360-degree live streaming

A 360-degree live broadcast on online channels, as part of an effort to interact with the social environment, is a new technological opportunity for a brand to stand out. YouTube and Facebook provide the ability to broadcast real-time 360-degree video content that can be viewed with VR devices, Google Cardboard with a smartphone inserted into them, on a computer or on a tablet.

This is a completely new way to interact with an audience of current and potential customers and consumers.

Create your own VR app

Creating a VR app allows you to enhance the experience itself by providing opportunities for the user to interact with the virtual environment.

With the ability to be fully immersed in the environment, the app allows for a personalized VR experience in a way that 360-degree video on YouTube cannot achieve.

For example, VR real estate demonstration apps could be used to provide a unique sense of a building and the spaces in and around it. At its core, a VR app is a great platform to deliver a higher level of experiences that require a wider range of interactions other than the traditional "play-stop."

SUMMARY

Virtual reality offers a whole new immersive experience, highly suitable for corporate or product presentations. It can be used in sales, marketing or internal employee communication to create an exciting and engaging encounter that the team or customers, by literally transporting them into the world of the brand, will remember long afterwards.

By asking, "What can we do now that we couldn't do before, thanks to changes in technology and consumer behavior?", we'll find that VR technology, as part of an overall digital transformation strategy, can help any organization rise above the competition. In this way, any company can go step by step towards "market leadership in times of significant disruption".

But for a VR presentation to be successful, it must be well planned and directed to achieve the necessary impact and end result.

BEST PRACTICES

"THE COPPER HEART OF BULGARIA"

The Aurubis Bulgaria plant has over 60 years of history. Since 2007, it has been part of the Aurubis Group - Europe's largest copper processing company with nearly 7,400 employees, operating production facilities and a sales network in 24 countries on three continents (fig. 9).

Interest in the production activities at one of the largest plants in Bulgaria is high and the company organises open days where external visitors can take part in an organised visit to the plant. These visits arouse great interest, but create significant difficulties for the team. Metallurgical production is a very complex, responsible and dangerous process and the visits require a great deal of organisation, coordination and carry certain risks. Before each visit within the plant, visitors are given a forty minute safety briefing.

The company decided that the VR presentation would eliminate many of the inconveniences associated with physical visits to production areas, while also introducing viewers to processes they might not witness.

The product is aimed at both professionals and the general

fig. 9

fig. 10

public. To this end, the presentation had to be complete, professional but also attractive.

The VR film "The Copper Heart of Bulgaria" is an exciting adventure that begins with the formation of the universe as matter, energy, chemical elements and life in general, the discovery of the metal copper - one of the most important for human evolution, and continues with the processes and activities at Aurubis Bulgaria, thanks to which the highest purity copper is extracted. Immersing the viewer in the panoramic environment of the production atmosphere is perhaps the only option for him to be introduced up close and in a way unthinkable by other means, in such a short time and guided by the expert narration of employees from the plant.

The VR film has become a corporate video business card, with which the plant presents to partners, customers and the public its production and the importance of copper to life in general.

Over time, new uses of the product were discovered, such as using it to introduce the production facilities to new management-level employees.

fig. 11

2. MARKETING AND ADVERTISING

BRAND IS A MATTER OF PERCEPTION

In order to successfully build a relationship with a customer, three key elements are needed - to engage their attention, to convey our message and to be remembered. By the time we've managed to capture a potential customer's attention, they've already seen hundreds of photos and videos, and heard countless messages. So how do we make them remember us? How do we set ourselves apart from everyone else? The solution lies in finding an innovative and creative approach, and VR is one of the best tools for that. Through VR, the audience is "immersed" in the presentation, isolating themselves from all external factors. Viewers are at the center of the events and experience them, which forms much stronger and lasting impressions in them. The combination of a creative approach and appropriate technology has the potential to create brand ambassadors.

The marketing department is the one that seeks to form a certain perception of the business in consumers and functions more than other specialist departments as the 'calling card' of the company. The use of new technologies and platforms has the potential to significantly support the realisation of this goal.

In the following lines, we will look at five reasons why creating virtual reality content for businesses will bring them additional benefits:

1. Growth of the VR industry

Today, Virtual Reality is being embraced in the same way that mobile was 20 years ago. Back then, people felt that experts' predictions of the mobile industry's meteoric rise would prove true and this sector of the economy would reach enormous proportions. Today, predictions and expectations towards Virtual and Augmented Reality are similar. According to Goldman Sachs, one of the world's leading investment and analyst firms, the virtual and augmented reality market will reach $80 billion by 2025.

2. Wide variety of virtual reality headsets

Until recently, owning a virtual reality headset was considered extremely expensive. The cost of such equipment easily exceeded 2000 EUR. Another problem was the lack of enough attractive and quality content. Developments in technology allow there to be a wide range of devices on the market today, many of which do not need an additional computer. Such standalone VR headsets, which offer very good quality, can be purchased at prices between 300 and 500 EUR.

3. Audience engagement

We live in a dynamic world. That's why businesses work tirelessly to capture the attention of their potential customers. Virtual reality is the ideal tool for this purpose. When a person puts on virtual reality goggles and a headset, they are "transported" to another world - they can't avert their gaze or get distracted with their phone or otherwise. He is fully immersed in the environment you are offering him.

This type of content can also be uploaded to a website, Facebook or YouTube, in the form of 360-degree videos or photos that can be viewed without VR headsets. VR has been proven to capture and hold attention for longer.

4. Subject to strong interest from consumers

According to a Greenlight VR survey of 1300 US consumers, more than half say they are more likely to buy from a brand that provides a virtual experience. Two other notable findings from the survey are - 71% of respondents say that a sponsored VR experience evokes a forward-thinking brand association. Additionally, 62% of respondents claimed that VR leads to a sense of brand engagement.

Market research giant Gartner states that virtual reality is rapidly approaching the "productivity plateau," i.e., the phase where, due to technological prerequisites and common experiences, widespread use in companies is inevitable, and the technology becomes widely adopted in society.

5. Watching becomes an experience

"Immersion" is "the perception of a physical presence in a non-physical world". The user using virtual reality knows that they are currently in the virtual environment, but at the same time experiences that environment as something real.

The ultimate marketing goal, namely that the message we want to convey remains in the user's long-term memory, is much easier to achieve through this approach.

In order to create this sense of "immersion" in the environment, it is important that the user is surrounded with images, sounds, or other stimuli that create as immersive an overall environment as possible.

The more professionally and realistically a virtual reality experience is created, the greater the effect on users.

The principle of "immersion" meets the main objective of marketing - grabbing and holding attention.

ADVANTAGES

▸ Virtual reality content evokes emotions, creating trust and building loyalty;

▸ The use of virtual reality during campaigns and promotional events inevitably attracts eyeballs. Consumers who participate in the experience go all the way through the product presentation without distraction. This makes the message much more likely to reach them. For brands, virtual reality is an opportunity to tell their brand story without losing the interest of consumers;

▸ It has a direct impact on the viewer and provokes a new kind of emotion - it leaves lasting impressions, leading to longer-lasting retention of information and greater consumer interest in the brand;

▸ Through VR, a large amount of information can be synthesized and presented to customers in a compelling and interesting way;

▸ VR enables brands to give product experiences that are much more impactful than traditional content and 2D promotional videos. It has been proven that 360 degree panoramic video content on banner advertising on internet platforms increases:
  - three times the likelihood that a customer will view the ad and follow a link to the product;
  - 30% repeat viewing of the content;
  - 70% to 300% customer willingness to commit to a purchase.

▸ Viewers can be active participants. When designing VR applications, a large number of interactive elements can be integrated for the user to actively use. In this way, the immersive experience is further enhanced because he or she becomes part of the narrative, rather than just a passive observer

▸ Information perceived through the "immersive" experience that virtual reality provides stays longer in memory, including product information or other marketing content.

CHALLENGES

▸ Wide variety of advertising channels and increased competition;

▸ Saturation of content and messages;

▸ A desire to retain/engage consumer attention for longer periods;

▸ Increasing advertising costs while decreasing advertising effectiveness.

APPLICATIONS OF VIRTUAL REALITY IN MARKETING

Today, content is everywhere and it's everything, at least from a marketing perspective. But with a dearth of compelling campaign ideas and oversaturated content platforms, creating winning marketing strategies is a challenge marketers face almost every day. For them, virtual reality can be a breath of fresh air. In the following lines, we will introduce you to some of the most common applications of virtual reality in product marketing.

VR FOR CORPORATE OR PRODUCT PRESENTATION

The effect that VR experiences achieve is a powerful tool that marketers should use to turn a boring and traditional presentation into a compelling and memorable one. Because "being interesting" is the key to a successful presentation or product launch.

VR TO ANNOUNCE A NEW PRODUCT TO THE MARKET

Brands can generate more interest in the product and provide

detailed information about what it offers. For example, instead of reading a promotional brochure or watching a video about a new car, consumers can get a feel for what it's like to sit inside it.

VR FOR AN IMPACTFUL MEDIA CAMPAIGN

It's not often that companies exhaust their social media content strategies. VR offers new opportunities to retain audiences, build a closer relationship with the consumer, and expand the customer base. Social media combined with VR can achieve very good results.

VR IN ORDER TO COLLECT ANALYTICAL DATA ON CONSUMER BEHAVIOR

A key element of marketing is consumer interest and behavior data. Virtual reality takes data analytics one step further by digitizing behavioral patterns that are difficult to measure.

VIRTUAL REALITY IN THE CONTEXT OF THE AIDA MODEL

Let's look at how virtual reality relates to the phases of new customer acquisition using the famous AIDA model in the context of VR.

AIDA and VR - or how marketing theory meets technology?

In marketing, there are many different models and theoretical approaches to systematize and plan the customer acquisition process. We will illustrate the positive effect of VR on marketing with the help of one of the best known and perhaps most classic models, namely AIDA.

AIDA stands for Attention, Interest, Desire, Action and was invented as a principle in the early 1900s by St. Elmo Louis, who is considered a legend in the advertising industry. The AIDA Stage Model charts the (prospective) customer's journey through four phases to finally reach the decision to purchase a product or service.

The phases of the AIDA model (fig. 12)

Attention

In this phase, visibility is the critical success factor. Virtual reality is a proven way to capture attention during events of all types while providing a different experience.

Interest

This is one of the main advantages of VR - the technology itself provokes interaction, through which different elements, structure, advantages and different applications of the product can be shown in depth.

Desire

The potential customer already knows how the product or service works or what it's like to work for the company. It is then important to elicit a specific purchase intent, booking or desire to join the team if it is an HR presentation.

Action

once attention, interest and desire have been triggered, the desired action can be taken, depending on the capabilities of the specific VR application.

fig. 12

SUMMARY

Virtual reality is here to stay! The use of VR technology in recent years has been more of a demonstration of the possibilities it offers, but in the future the potential for its development and application in modern corporate and social life will become more and more apparent. Super Data Research predicts that the budget that companies are investing in VR projects at this time will double globally over the next three years.

The technology brings fundamental advantages that contribute to increasing user engagement in every phase of the customer experience. It provides new and exciting ways to interact with media content, allowing people to be not just passive observers but active participants.

BEST PRACTICES

VR/360° WINE TASTING FROM BRATANOV WINERY

The small family winery "Bratanov" from the southern Sakar region creates a short VR film to enrich wine tastings with a new and different experience for consumers. The overall product is a multi-sensory event where visitors taste different wines and the appropriate foods, at a certain moment placing VR kits on their heads and getting to know virtually the whole process of creating the beverage they consume. In the VR experience, they get to meet the company owners, the oenologist and other key players in the winemaking process while they are in the vineyards, production rooms and cellars where the wine is aging. Their virtual hosts introduce them to the history of the winery and the specifics of their production (Fig. 13).

fig. 13

BEER OLD IRISH - GEORGIA

An exclusive advertising campaign that is a combination of VR experience and traditional media. The team organized a VR experience - a surprise. Special equipment was delivered to a pre-prepared location - a recreation of an Irish pub in mobile containers that are masked for passers-by. People are randomly invited to visit Ireland wearing virtual reality goggles. While "immersed" in their VR experience, people do not sense that the reenactment of the Irish pub is assembled around them, with actors in it. The VR film takes it to just such a bar with exactly the same actors. Taking off the VR goggles, the participants find themselves in the same place as in the film, where the actors greet him "Irish style" and he samples the beer.

This whole experience was filmed using traditional methods and a promotional video was created which became extremely popular online and achieved millions of views.

fig. 14

JACK DANIELS WHISKEY

One of the world's best-known whisky brands is running a global VR promotional campaign (Fig. 15). Viewers learn about the history of the brand and how whisky is produced. The presentations themselves are carried out by promotional teams at events and even in selected drinking establishments. Guests are given the opportunity to watch the VR film, experience authentic whisky production methods and taste classic Jack Daniels.

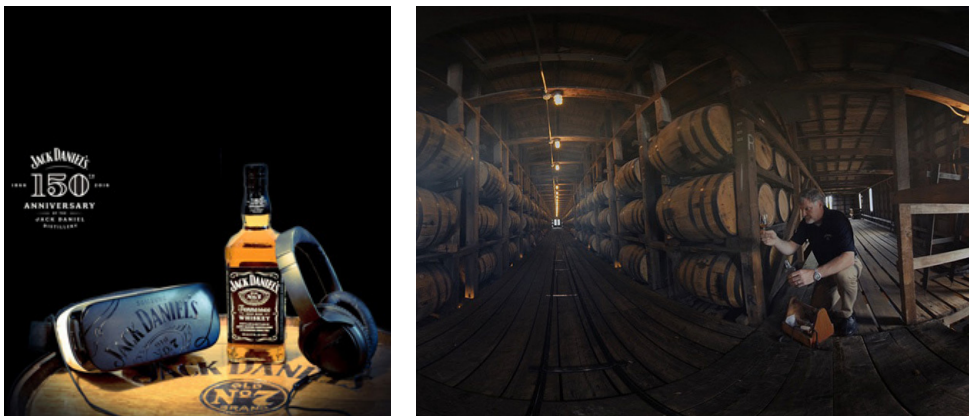Guests can then purchase at discounted rates. The campaign has been a great global success.

fig. 15

NESTLÉ

Nestlé uses VR in the context of its campaign to import high-quality chocolates into the US. In 2015, Nestlé began selling Cailler chocolate outside Switzerland as part of the development of the super-premium chocolate market (Figure 16).

Nestlé decided that the best way to promote these products was by giving consumers the opportunity to enjoy a tasting of the fine chocolate while being on a virtual tour of the factory where it was made.

fig. 16

3. HUMAN RESOURCES

VR technology is increasingly emerging as a valuable tool in all aspects of HR - from attracting and selecting employees, to training and appraising them, to periodic refresher courses.

The technology is highly applicable in the context of training. This is because experiential learning is achieved, leading to a much better retention and understanding of the material. On the other hand, the technology enables the simulation of dangerous situations in a safe environment.

VR trainings allow for detailed performance evaluation, detailed statistics and development of different scenario lines based on the participant's choices, etc. The data generated from testing the knowledge and skills of trainees is a valuable basis for analysis and decision making by HR professionals.

ADVANTAGES

▸ Higher information retention* (the process of transferring new information into long-term memory.) The human brain treats VR experiences as it would in real life, which contributes to easier retention of new knowledge in the learner's skill set. According to a study done by the *National Learning Lab (National Education Association of the United States), the retention and comprehension rate for lecture-style learning is 5%, increasing to 10% with reading and 75% through VR;

▸ The effect of complete "immersion" in the situation - so-called learning by experience;

▸ Higher degree of attention engagement;

▸ Real environment and real people - a sense of real presence (in the case of 360 degree interactive video);

▸ Applicable to different industries;

▸ Possibility of different scenarios with role plays and conclusions;

▸ Testing and evaluation tools;

▸ Analytical data generation;

▸ High cost-effectiveness - VR allows for multiple repetitions of a given training and is a safe way to practice reactions to a dangerous situation, represent a costly production process or a specific rare scenario that would be very expensive or dangerous to recreate in a real environment;

▸ A self-development tool for learners - one can watch the VR experience repeatedly, which helps improve long-term memory and better retention of information;

▸ Not affected by economic cycles - when a company creates its own VR training product, employee training will not be affected by times of crisis or recession;

▸ Multilingual.

CHALLENGES

▸ Digital transformation;

▸ Staff turnover or the so-called "war for talent";

▸ Search for innovative approaches in the process of attracting staff;

▸ Search for new opportunities for employee self-learning;

▸ Training employees to work in hazardous environments or specific manufacturing processes that may endanger their lives or are too costly.

APPLICATIONS OF VIRTUAL REALITY IN HUMAN RESOURCES

RECRUITMENT

Employees whose skills and competences will raise the level of work and bring profit in the future are a priority for every company. In recent times, companies are in a constant struggle to attract talent and are trying in every way to demonstrate their innovativeness, attractive working environment, teams, etc. All factors on which depends how successfully the company performs in the market for personnel.

Virtual reality is an excellent tool in this regard. The potential employee "enters" directly into the environment, sees his future colleagues in the process of communication at work and rest, the advantages of the office environment and the overall atmosphere. VR "attacks" the senses and enhances the motivational element

in times compared to traditional promotional video presentations.

Applications of VR in the recruitment process:

Promoting the employer brand

showcasing the work environment, processes, corporate social responsibility, various benefits, engagement and company values (fig. 17);
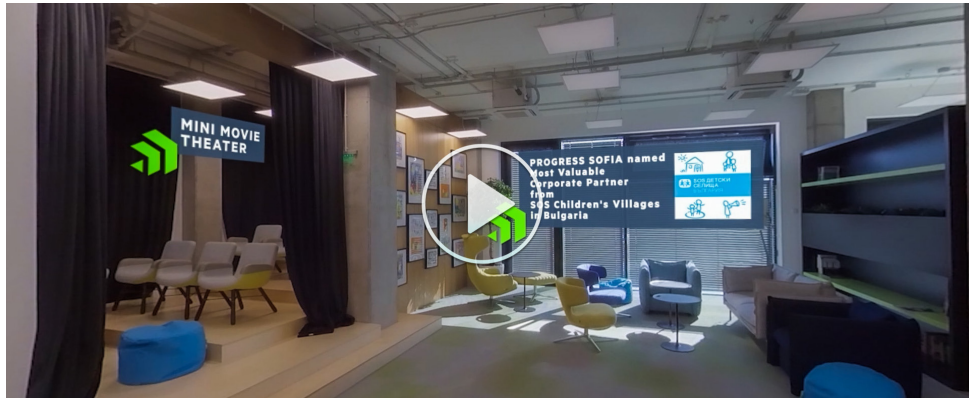

fig. 17

Assessing job candidates

VR role-playing tasks that enable participants to reveal their strengths and knowledge, and HR experts to assess performance impartially and based on multiple factors and analytics (fig. 18).
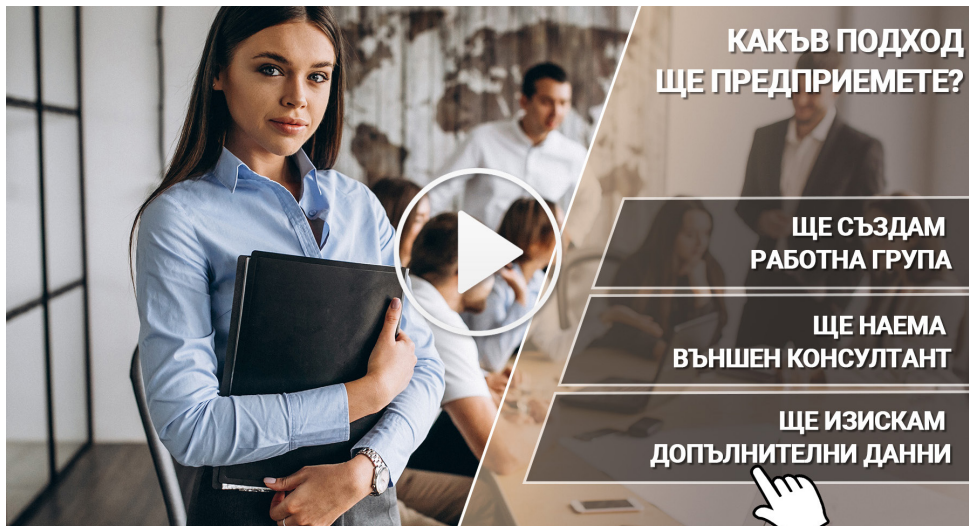

fig. 18

Onboarding - initial introduction to the company

In order to provide the best possible start and to enable new employees to work efficiently and effectively, they should meet representatives of the different units in the company, get acquainted with the processes and relationships between departments, go through on-the-job training, safety briefings, etc. This process, in addition to being costly, is often time-consuming and leads to interruptions in the workflow of other employees in the company. Virtual reality allows all of this information to be collected, synthesized and presented to employees in an understandable way, allowing them to learn autonomously and to refresh their knowledge over a period of time and when necessary.

TRAININGS

VR is used to create interactive scenarios that reflect in detail real life situations - routine or emergency, ones in which skills are trained, knowledge is built upon, role plays are entered, trainees are tested and evaluated. Recreating a hazardous work environment makes VR training an indispensable tool as it provides a safe space to learn high-risk skills. From the defense and aerospace industries to the oil and gas sector, VR is being used to simulate potentially fatal scenarios without compromising safety.

"Today, what really makes companies successful is something we call upskilling - learning faster, iterating, innovating, understanding customer needs."

Josh Bersin, Global Industry Analyst, Founder BersinTM by Deloitte

fig. 19

In VR, the experience is transformed from passive to active. This effect is achieved by shifting the mere consumption of information to an experience in which participants must actively navigate. Two concepts that are essential for the transformation from passive learning to active learning are immersion and interactivity.

According to a report by PwC (PricewaterhouseCoopers), learners learn four times faster through virtual reality and are 3.75 times more emotionally connected to content than those who have participated in lecture-type training. In their study, learners were 275% more confident to apply skills learned after participating in VR training, and four times more focused than those who received standard online training on a computer or other media format.

ADVANTAGES

Improved learning and performance

The 70/20/10 model - 70% of what people learn is based on experience, only 20% is based on what other people have learned and only 10% is through formal training.

Recreating dangerous or impossible situations

Hazardous work environments, continuous production lines, and learning life-saving procedures make hands-on training too risky or operationally impossible. The ability to recreate real-world challenges means we can reduce the time it takes to acquire a high level of competence and create a well-trained workforce.

Accelerating the learning process

"Immersive" learning experiences enable employees to learn quickly and efficiently. Virtual reality also creates a distraction-free environment - an important factor that helps learners learn easier and faster.

Cost reduction

In the long run, the introduction of VR training reduces the company's costs. The initial investment required in creating content and purchasing hardware pays for itself very quickly, as significant costs are saved from organizing training events related to travel, sleeping, speakers, and other incidentals.

In addition, there are also tangible indirect cost savings from minimizing downtime and eliminating the need to stop production to increasing productivity by having better trained and experienced employees.

CONVENTIONAL TRAINING COSTS	VR TRAINING COSTS
Related to trainers	**Related to trainers**
- fees for trainers; - travel expenses; - accommodation; - catering; - facilities; - materials; - multimedia content; - technical equipment.	- fee for trainers; - multimedia VR content - technical equipment.
Related participants	**Related participants**
- travel costs; - accommodation; - days away from work; - travel expenses; - logistics.	- logistics.

Learning Retention Rate

Researchers at the University of Maryland have conducted one of the first in-depth analyses of whether people learn better using virtual reality or more traditional platforms and methods, such as a desktop computer, tablet, book or lecture (fig. 20)

TYPES OF VIRTUAL REALITY TRAINING

SOFT SKILLS

Soft skills can be broadly defined as a set of social and communication abilities. As an expression of emotional intelligence,
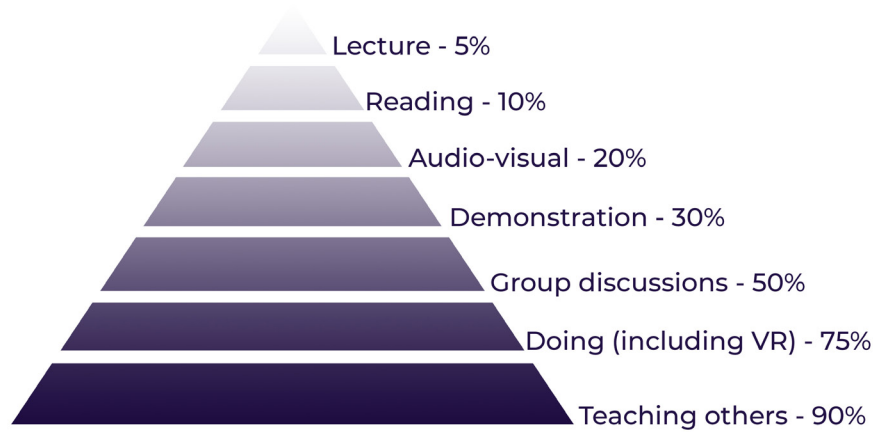
Fig. 20 learning retention rates

(Source: National Training Laboratories (National Education Association of the United States))

soft skills are at the core of how we interact with others in any given situation. Recreating real-life scenarios from everyday life, role-play based training, enabling behaviour change through practice and self-reflection are the gold standard for behavioural learning.

PriceWaterhouseCoopers is conducting research on the effectiveness of VR training for leadership and soft skills, and whether it has advantages over traditional classroom or e-learning methods. The study showed 40% higher self-confidence and learning scores for those who received virtual training compared to those who participated in classroom-style training and 35% better scores compared to employees who received only e-learning. VR learners completed their training 4 times faster than those undergoing classroom-style training and were 4 times more focused on content than their counterparts participating in e-learning and 1.5 times more focused than counterparts undergoing classroom-style training.

Virtual reality training cannot and will not completely replace other forms of training, but it should be considered as part of a blended learning curriculum to acquire specific types of skills.

DEALING WITH DIFFICULT CUSTOMERS

Virtual reality enables frontline employees to practice interpersonal skills and leadership tactics so that they recognize and respond to situations appropriately, preventing negative consequences from developing.

HAVING DIFFICULT CONVERSATIONS

US company Walmart is reaping the benefits of virtual reality training by helping store managers to practice difficult conversations with employees who are typically late or lack the skills to handle customers "gracefully." In addition, the retail giant is also introducing virtual reality training modules that enable sales associates to practice customer conversation scenarios from different perspectives.

SAFETY, HEALTH AND HAZARD AND RISK IDENTIFICATION

Virtual reality is the closest possible way to reality to recreate situations and training involving increased health risks for learners that is 100% safe, and to acquire practical skills without interrupting technological processes.

Another application of VR, in this context, is training on the operation of expensive equipment.

EMERGENCY RESPONSE TRAINING

Training store employees and how to respond in rare or emergency situations, such as armed robbery, has always been difficult. They may be presented with a list of protocols and even given role-play exercises, but it is impossible to predict a person's real-life response to such an extreme and stressful situation.

US company Verizon used VR to create realistic training for employees in its stores on how to react in an armed robbery situation (fig. 21), which is a real challenge to teach in the traditional way of training. Employees are put in the middle of a real armed robbery. VR training allows a person to experience the initial stress in a safe environment, reinforce and practice response protocols, and go through the critical steps needed to de-escalate high-risk moments. Verizon employees report 97% satisfaction with VR training and, more importantly, 99% of them say they feel better prepared to respond when this type of situation occurs. Verizon delivers its VR training to all of its stores and 22,000 employees.

fig. 21

SUMMARY

Human capital management requires HR professionals to create different, enriching and useful products and activities for employees and the company. The challenge for them is to find an approach that is useful and interesting enough for the employees, and brings them added value and long-term knowledge.

The use of VR in HR has a measurable impact. Some of the world's largest companies using virtual reality have reported that their employees' training time has been reduced by 40%, customer satisfaction scores have increased almost immediately by 10%, and the number of employees who feel better prepared for their jobs has increased by 100%.

BEST PRACTICES

PROGRESS software Bulgaria

In 2014 the American software company PROGRESS bought the Bulgarian software developer Telerik for a record 265.2 million dollars. Since then, the new branch of the global giant is called PROGRESS Sofia and is one of the leading companies in the IT sector in Bulgaria. The company's main priority is its employees. Staff selection is extremely precise and the working conditions and overall atmosphere are of excellent attestation. It is no coincidence that Forbes Business Awards awarded the company the "Employer of the Year 2020" prize.

The corporate VR/360 film, created in collaboration between Progress Sofia's marketing and HR departments, aims to elevate employer branding and attract the attention of top IT professionals who would make excellent additions to the company's team (fig. 22).

The efforts are aimed at creating a product that would make the company stand out from the competition, "speak the language" of the desired job candidates and present the working conditions and atmosphere in the company's office in the best possible way.

The VR presentation and the campaign associated with it won 1st place in the "Best Employer Branding Video" category at the Employer Branding Awards 2020, organized by B2B MEDIA.

fig. 22

VR CUSTOMER SERVICE TRAINING
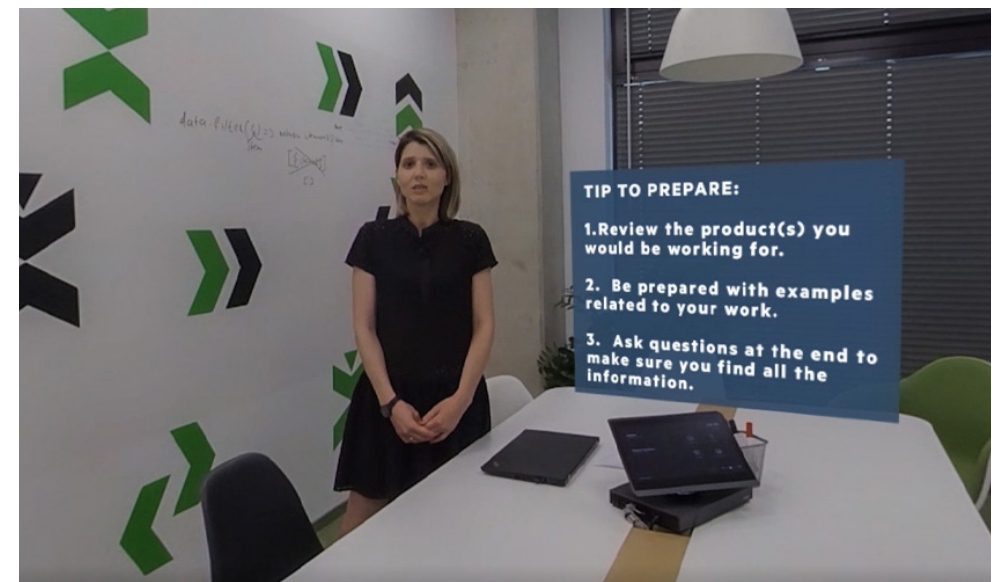
Training aimed at dealing with difficult customers in the hospitality sector. The trainee receives initial theoretical guidance and is then placed in different situations where he has to choose how to react. Each choice the participant makes leads to a different outcome of the situation. The training with an integrated test part and with the possibility to generate analytical data (fig. 23).

fig. 23

COMMERZBANK DIGITAL TECHNOLOGY CENTER SOFIA

In 2020, Germany's second-largest banking institution opened its digital technology center in Sofia. In 2022, a VR product was created to support the HR department in recruitment activities. This type of product is standard across all divisions of the company (fig. 24).

fig. 24

OTHER EXAMPLES FROM THE WORLD

Bank of America

Bank of America is the first financial institution to launch a virtual reality training program in its nearly 4,300 centers in 2021. The technology helps employees further enrich the skills needed to ad-vance their careers and meet the diverse needs of customers (fig. 25).

fig. 25

4. EVENTS, EXHIBITIONS, CONFERENCES

Technology has already revolutionized the way many companies present themselves, their products and services, and the way they engage visitors at events and conventions. From training, information and brand promotion events, to product and service demonstrations, virtual reality is the one factor that will raise the level of interest and increase visitor numbers, conveying the company's message in an

unforgettable way.

WHY VIRTUAL REALITY FOR EVENTS, EXHIBITIONS AND CONFERENCES?

Whether you need to organize an event remotely, or to diversify and enhance the experience during a conference or exhibition, or simply to create unforgettable and enriching emotions for employees during teambuilding, VR is the right choice.

When organizing events, companies are always faced with the question of how to attract more visitors and engage them with their own products. Setting up a dedicated space, either a demo booth during events or your own mobile VR booth, are excellent ways to attract people and their attention. They will be fascinated and intrigued. Everyone will want to try it. Beyond the sheer impact on direct attendees, these types of presentations can provide highly engaging content from the venue that brand followers and the general public on social media and internet platforms will be able to watch. And content that will enable the company to stand out amongst the competition.

Virtual reality can create greater emotional engagement than traditional alternatives. According to a study by VR experts at Stanford University , VR can help people become more compassionate compared to other types of media content. By hosting VR events, audiences can immerse themselves in memorable experiences that create a deep and meaningful connection to a cause, brand or idea.

ADVANTAGES

▸ Virtual reality increases visitor traffic to the exhibition stand or other type of exhibition space, which in turn leads to an increase in the number of potential customers;

▸ A proven means of standing out amongst the competition is the fact that the technology is new and piques the curiosity of visitors. Apart from the viewer making various gestures and facial expressions as they are fully immersed in the experience, this type of presentation also arouses the interest in bystanders, leading to a clustering of people around the stand during the trade show/event. To make the presentation even more intriguing, it is a good idea to place a screen on which other visitors

can observe the content that the person sees through the VR set. This generates additional interest and attracts more visitors;

▸ VR enables companies to showcase their full product portfolio in very small spaces while engaging potential customers with the brand in a truly unique and memorable way;

▸ Virtual reality is very interesting possibility to entertain and unwind employees during team building, Christmas party, workshops and any kind of company events.

CHALLANGES

▸ Constraints related to geographical remoteness;

▸ Standing out among the competition and the sea of identical advertising approaches and materials;

▸ Positioning the company as an innovator;

▸ Organizing events and conferences under physical and logistical constraints.

APPLICATIONS OF VR FOR EVENTS, EXHIBITIONS AND CONFERENCES

VIRTUAL REALITY AT A PHYSICAL EVENT

Whether participating in a trade show, conference, charity event or festival, companies must always find new ways to stand out among their competitors, attract and retain the attention and interest of their customers, and increase the impact of their messages on audiences through innovative means and techniques. Pretty pictures or promotional videos will certainly attract attention, but they can't fully engage and involve audiences the way virtual reality can. So the company's message will have a much more intense impact, and the information conveyed will be remembered much longer.

Companies can use virtual reality to present their future projects in a very realistic and attractive way.

There are a number of examples of corporate presentations, but also interesting is the approach of the EU Saves Lives initiative, which uses a VR experience to show visitors to several

European cities first-hand how emergency aid is provided during natural or man-made disasters. Presented in this way, the experience gives another perspective to the viewer and is far more memorable than the storytelling.

VR projects of this type can also be used afterwards outside of specific events for digital marketing, online presence, fundraising for causes and advertising.

Virtual reality is an extremely suitable tool for sales at trade shows.

Through it, companies can use technology to present their products in the ideal environment for them, where their benefits can be presented in their "full glory" and not just on the stand itself (fig. 26).

Very large products/objects for which there is not enough physical space in the exhibition areas, e.g. aircraft or construction machinery, etc., can also be presented via virtual reality.

Events such as charity gala dinners can use VR as a tool to increase emotional engagement and attract donations.

This effect can be achieved by showing the audience first-hand the urgent need for donation contributions.

Charity:Water used virtual reality under the tagline "seeing is believing" at their annual charity dinner. During the event, VR goggles and headsets were given to each attendee. When attendees put on the goggles, they are transported to a small village in Africa where they see a 13-year-old girl receive clean drinking water for the first time in her life. The virtual experience is so realistic and moving that $2.4 million was raised during the benefit dinner - far more than originally planned (fig. 27).

Virtual reality for in-house events

Virtual reality is a very suitable way to entertain as well. Many companies are starting to use the technology as a tool to unburden employees during team building, Christmas parties, workshops and all kinds of company events.

fig. 26

fig. 27

SUMMARY

Virtual reality provides an exceptional opportunity for any company to convey its message and engage current and prospective customers in a new and interesting way, regardless of the type of event it is participating in or organizing.

It differs significantly from other media formats in terms of impact, as it aims to 'immerse' the viewer fully in the content, tricking the brain into processing the experience as actually happening. Thus, it stays in the mind of the person much longer, as it is also linked to a first-person experience of emotions. Such an effect could not be achieved with a standard video or photo.

The technology is evolving and improving and will be used more and more in the future as the industry sees its huge potential.

EXAMPLES

VR/360 video presentation of Bratanov winery at the "Young wine defilee" festival - Plovdiv 2021 and 2022, DiVino Taste 2021 and "Wine and gourmet" festival, Plovdiv 2022

The small family winery "Bratanov" from the region of South Sakar uses VR to enrich wine tastings and create a new and different kind of experience for consumers. The overall product is a multi-sensory event where visitors taste different wines and the appropriate foods, at a certain point placing VR headsets on their heads and getting to know virtually the whole process of creating the drink they consume. In the VR experience, they get to meet the company owners, the oenologist and other key players in the winemaking process while they are in the vineyards, production rooms and cellars where the wine is aged. Their virtual hosts introduce them to the history of the winery and the specifics of their production (fig. 28).

The company attracts great interest during the events, while provoking guests to make a real visit to the winery.

Presentation of 360° films for cultural-historical heritage during the 16+1 meeting of the Heads of Governments of Central and Eastern European countries and China

Presentation of 360° films from the series „Immerse into the culture in 360'' during the Bulgarian Presidency of the Council of the EU, 2018.

Presentation of 360° films on cultural and historical heritage at the 2018 international conference of CERN in Sofia.

Three major international events at the highest level where VR technology allowed delegates to experience cultural and historical sites from Bulgaria that are of global importance. Attendees at these events were unable to actually visit historical sites due to the busy schedule, event dynamics and logistical difficulties. The VR films allowed them to "immerse" themselves in the history of the sites and Bulgaria as a whole (fig. 26).

The municipalities of Sofia, Veliko Tarnovo, Varna, Kyustendil, Ivailovgrad etc. are using VR products about their cultural heritage during international touristic exhibitions in Bulgaria and abroad (fig. 27).

фиг. 25

fig. 26

fig. 27

5. TOURISM

WHY VIRTUAL REALITY IN THE TOURISM AND HOSPITALITY INDUSTRY?

VR is becoming an increasingly popular method for showcasing the tourism resources, potential and offerings of destinations and entire regions and countries.

The technology is finding applications in many areas related to tourism, including planning and management, marketing and advertising, entertainment, education, accessibility and heritage conservation.

Through VR, tourists have the opportunity to preview the places they find interesting and assess what best suits their interests and needs, "experience" a variety of attractions and itineraries in advance and make an informed decision. VR also allows users to experience protected or dangerous tourist sites that cannot be visited or to experience places that no longer exist or to witness past events. In addition, VR is an extremely suitable option for "travel" for elderly or disabled people for whom a real visit would be difficult, and in some cases even impossible.

The use of virtual reality in tourism is a way to promote and improve the tourist experience, but this in no way means that it is a substitute for real travel.

VR/360° video productions are a highly suitable tool to showcase the hospitality industry, which is increasingly becoming an experience industry. They are a big step forward compared to the well-known VR tours from panoramic photos. 360 degree panoramic and in better cases 3D video, greatly enriches the experience compared to static panoramic photographs. The technology allows every person, no matter where they are in the world, to be "transported" to any destination, hotel, attraction or event, to feel the atmosphere, to explore in detail every nook and cranny from

the reception desk, through the hotel room, the restaurant, to the relaxation and entertainment areas, the on-site attractions inside or outside the venues, as well as the cultural, historical and natural attractions of the region. By "putting" the viewer "inside" the experience itself, a stronger and more emotional connection is built with the viewer, and this provokes the desire to actually visit.

Customer-centric industries are looking for ways to provide customers with experiences that provoke consumption. VR takes emotions and experiences to a new level! Presenting stories in a virtual environment leaves a lasting memory because the human brain is wired to remember events in which it was an active participant as a priority.

To remain competitive in the long term, to increase their audience and to meet the demands and expectations of the new generation of tourists, tourism companies must strive to integrate new technologies and enrich their marketing strategies by integrating innovative/interactive and compelling content.

Through virtual reality, information about tourism products and services is presented in a different, much more impressive and compelling way, because this kind of experience has a positive impact on two of the most important processes related to the tourist's choice:

1. Information seeking or planning process

Through VR, tourists can be offered access to information about the destination in a much more accurate and as close to reality as possible than compared to traditional promotional materials such as photos and brochures.

With VR, users can be offered richer content, interactivity and a sense of real presence, which in addition enriches knowledge and deepens users' respect for the destination.

2. Decision or booking process

The buying or booking process is mostly rational - the user takes into account not only the choice of destination, but also the price and the activities he could experience there. Therefore, quality and interestingly presented information in sufficient completeness is of the utmost importance for the transaction.

For example, by taking advantage of a 360° presentation of a site

or destination, the tourist could explore and 'immerse' himself in a particular experience and assess whether it meets his expectations, whether it arouses enough interest in him to make the booking. In this case, emotions are an important element in the decision-making process, and virtual reality aims to activate them by stimulating the senses of users..

ADVANTAGES

▸ Sense of real presence;

▸ Getting to know in detail in a 360 degree environment;

▸ Provoking an emotional experience unlike any other;

▸ Forming a lasting memory which, from a psychology perspective, is an advantage when choosing a future holiday destination or an entire destination.

CHALLENGES

▸ Engaging consumer attention;

▸ Providing attractive and engaging information;

▸ Provoking emotions in users, respectively desire to actually visit;

▸ Inability of vulnerable groups of people (elderly or disabled) to visit a site/destination;

▸ Disappointment on the part of customers - there are cases where there is a big gap between the expectations of customers and the actual experience they receive;

▸ The visit of large numbers of tourists may threaten the existence of some sites or areas of global importance.

VIRTUAL REALITY AND TOURISM MARKETING

Types of tourism and application of virtual reality

One of the most common uses of virtual reality in the tourism industry, is for marketing purposes. A very suitable advertisement

for a destination is to shoot a 360 degree video about the opportunities it provides to its guests, creating the feeling of actually being present at places and events, in a very different and attractive way.

This gives the user the feeling of being "there". Although simple images and videos can also show what a destination has to offer, they often do not evoke an emotional response and connection.

This is the great advantage of VR - the ability to put the user at the heart of the experience, making it easier to imagine themselves in the place.

Of paramount importance to the sector is the ability to create VR training for hospitality industry employees. It is one of the most affected by staff turnover, and good and fast training is of utmost importance. From trainings related to basic knowledge of the hospitality industry to more specialized trainings related to the corporate standards of certain companies (most often chains), VR is the right tool to save money, increase service quality and customer satisfaction levels.

Using virtual reality in a company's tourism marketing strategy has several key benefits:

- It creates emotions, which in turn help build a stronger relationship with the customer;
- It has the potential to increase sales and awareness of both travel destinations and sites and travel agents using VR;
- Enables travel companies to stand out amongst the multitude of offerings in the market, offering a new, modern and attractive experience;
- It also provides the opportunity for disadvantaged people or those with limited physical abilities to experience places, sites or services that they would not otherwise be able to visit;
- Reducing the impact of negative factors associated with the visit of endangered/affected destinations by large numbers of tourists.

Examples of VR implementation in marketing strategy of different types of actors in the tourism sector

- **Virtual presentation of a tourism destination** - public and private organizations involved in tourism in a destination can use technology to organize high-quality and innovative presentation of tourism opportunities. Using technology, an experience can be created that showcases different attractions and landmarks of the city, significant moments of history, cultural life, interesting routes or events and many other important elements to trigger a desire to actually visit. Once created, VR products can be used during exhibitions, promotional and negotiation events, as well as being provided to travel agents selling packages to a given destination.- Virtual hotel presentation - potential guests can be invited on a virtual visit to showcase the rooms, amenities and location. This will give prospective visitors an immersive experience and a feel of what it's like to stay at the hotel. In addition to virtual reality goggles, the virtual presentation can also be accessed online, via computer and smart device.

- **Virtual presentation of cultural and historical sites** - cultural and historical sites are some of the most suitable for presentation with technology, along with virtual visits to museums and galleries. They are the subject of separate chapters in the White Paper.

- **Virtual visits to museums and galleries**;

- **Virtual representation of extreme experiences** - Rock climbing, skiing, skydiving, paragliding, bungee jumping, diving and other experiences can be captured in virtual reality. This way, potential customers who experience them through 360-degree video and experience at least a small part of the adrenaline rush will be excited and provoked to book their place.

- **Virtual presentation of a winery, brewery or other production sites with tourist potential** - an innovative experience that can be a combination of tasting and virtual presentation of the entire production process of the given product. This type of presentation touches all the senses and leaves deep memories in the participants.

SUMMARY

In the future, virtual reality will increasingly find application in the tourism and hospitality industry. Many stakeholders see the

potential for the technology to transform the travel and tourism industry and the way it attracts potential customers.

Tourists will appreciate innovators who offer their customers a new, different and emotional experience because they are looking to buy experiences, not products. Virtual reality offers a great way to provide a completely new 'journey' that embraces all the senses, thus creating maximum value for the customer(fig. 28). The variety of services offered to meet the ever-growing demands of the market are creating to innovative leaders among travel companies.

fig. 28

BEST PRACTICES

DESTINATIONS

DESTINATION VRATSA - GREATNESS AND BEAUTY IN 360°

The creation of an overall innovative presentation of the region is divided into separate stages. In the first, a VR film is created about the main natural and some of the cultural and historical sites in the region and a series of events were organised to promote it. Several permanent VR presentation points have also been organised. The second stage is aimed at creating VR and AR products for the other main cultural heritage sites of the region, as well as the living culture.

The choice of virtual reality, and in 3D format, is an attractive way to present all this, and thanks to VR headsets, the viewer is isolated from the physical world in order to immerse in the amazing sights and reenactments of historical events, experiencing them personally.

The product is being presented at public events and tourist forums by the Knigini Association. They often give this amazing experience to students and people from elderly or disadvantaged homes. The emotion that the spectators feel when flying with a paraglider or from the top of the cliffs above the Vratsata Pass, "standing" on the edge of the highest point of the Vratsata Balkan, or under the spray of the mighty Skaklya waterfall, according to their words, is comparable only to that of a real visit.

For most elderly people, this is the only way to visit all the places from the film, to fly, to reach the top. For the young, the film is both a lesson in patriotism and a motivational tool to get out in nature and live with it (fig. 29).

fig. 29

WINE TOURISM

BRATANOV WINERY - A DREAM COME TRUE

The film is a 360 degree touch to the magic of wine making at Bratanov Winery - one of the family wineries in South Sakar.

The virtual visit to the winery and the first-person experience of the winemaking process is a new type of experience for wine lovers.

On the one hand, this type of presentation is extremely new and makes the Bratanov brand stand out as an innovator. On the other hand, providing a new type of experience to the winery's customers leads to building a stronger relationship between the producer of some of the highest quality and terroir wines in Bulgaria and its consumers (fig. 30).

fig. 30

HOTELS

HOTEL "DREAM", SOFIA - COVID PROCEDURES

The tourism sector was one of the most affected by Covid-19. The pandemic situation imposed new rules for work and stay in hotels. The VR production shows how a hotel and its team organize their operations and facilities to ensure a comfortable and safe stay for their guests.

The narrative is presented from the first person perspective of the hotel manager and staff, in a panoramic environment, with useful highlights in key areas such as the reception, hotel room, restaurant and service areas (fig. 31).

fig. 31

MARRIOTT - TELEPORTER

One of the largest hotel chains is organizing a special experience for couples who have just tied the knot. The company is installing interactive VR booths outside a New York City Ceremony hall, (fig. 32) where it invites couples on a journey through its hotels and the interesting experiences they would enjoy if they decided to spend their honeymoon with them. The campaign has been extremely successful in terms of direct interest from participants, but filming it and distributing it across online channels has had an even greater effect - building an image of an innovative company and raising awareness with the audience, and in a highly engaging way.

fig. 32

6. CULTURAL HERITAGE

There has been a shift in demand for the traditional type of experience associated with museums, galleries and visitor centers. The old model of passive participation, where people walk around and look at exhibits, is no longer sufficient. The use of interactive displays is becoming more common in the presentation of many exhibitions and museum displays, as it is increasingly difficult to attract the younger generation who perceive the traditional visit as a boring experience.

ADVANTAGES

▸ It provokes a responsible attitude towards cultural and historical values;

▸ Stimulates the interest of young people (who are particularly attentive to new technologies);

▸ Provides access to culture for people in disadvantaged or low social status;

▸ Promotes cultural and historical heritage.

CHALLENGES

▸ Seeking innovative approaches to improve access to and promotion of culture;

▸ Poor promotion and lack of innovative presentation of archaeological and cultural artefacts, sites and events in a way to attract new visitors;

▸ The need to use computer visualisations and modern devices in the presentation of cultural and historical heritage;

▸ Innovative presentation during events and exhibitions at local and international level;

▸ Lack of good infrastructure or limited access to certain sites

APPLICATIONS OF VIRTUAL REALITY IN THE FIELD OF CULTURAL HERITAGE

Cultural tourism is about motivating tourists to learn more about the local culture and cultural heritage of the destination they are visiting.

One of the important applications of virtual reality is providing an alternative experience - a virtual visit to areas of cultural heritage at risk or those with restricted access for tourists. VR can therefore be considered a valuable contribution to sustainable heritage management. The audiovisual aspects of virtual reality are perhaps the most important advantages of the technology.

For example, a virtual illustration of an artefact, object or event from the past can be an extremely attractive and different experience for tourists.

The benefits of applying virtual reality to heritage-based tourism are many, but here we will focus on two main ones - improving accessibility and marketing.

Accessibility

The list of cultural heritage sites that are virtually accessible is constantly expanding. More and more cultural heritage sites from different cultures and tourist destinations around the world have been digitized. Using 3D scanning devices, sites and objects can be converted into virtual 3D models. Such models can be a valuable tool for cultural heritage conservation. Although an artefact or cultural heritage object may suffer from natural phenomena such as erosion, a VR model can provide accurate information about its former appearance, track the extent of degradation or assist in the preparation of restoration plans. It can also assist in monitoring or visualizing the effects of potential restoration actions.

The virtual representation of a cultural heritage site can contribute to its conservation by allowing visitors to experience it in a realistic way without putting it at risk.

Marketing

The benefit of VR to the marketing of cultural heritage is largely based on its ability to provide a comprehensive set of cognitive and emotional information to potential tourists. One of the major drawbacks of a tourism product is that it cannot be tested prior to consumption. Internet customers buy this product based on current descriptive information found online or in printed materials. In this context, virtual reality is probably the most appropriate tool to present a tourism product to potential visitors/customers to help them choose.

In addition to being used as a tourism marketing tool, the virtual presentation itself can be used and sold as a separate element of the tourism experience.

Theme parks often use VR applications to enhance the customer experience. An increasing number of theme parks feature VR zones.

The technology can and is being used in museums, heritage areas and other tourist sites, and as a research tool.

The importance of virtual reality for the participation of people with disabilities in tourism activities is huge. Persons with disabilities who travel or want to travel are a generally neglected market segment. Unfortunately, there are a number of, sometimes insurmountable, obstacles faced by members of these vulnerable groups, such as incompatible architecture, inappropriate itineraries that make visiting impossible, financial constraints, etc.

SUMMARY

Virtual reality has an important role to play in the sustainable promotion, management and conservation of cultural heritage. VR technologies support the active presentation of cultural tourism opportunities, while at the same time can be used to reduce the pressure of intensive use of cultural heritage in the destination. When used in the context of tourism, VR can provide significant technological opportunities to strike a balance between the protection and use of associated cultural heritage. Virtual reality will play an important role in the future development of tourism. In line with technological developments, requirements and expectations of future tourists, it will provide significant benefits to the tourism industry.

BEST PRACTICES

"TARNOVGRAD AT THE TIME OF THE ASENEVTSI DYNASTY"

An interactive VR application that allows the viewer to choose which part of the Tsarevets fortress in Veliko Tarnovo to "visit" and find out more about the history associated with the places and personalities. The product is an interactive video experience with narration and additional information elements. Individual objects from the fortress, such as Baldwin's Tower and the Patriarchal Temple, are captured with photogrammetric technology and digitized as 3D objects also used in an Augmented Reality (AR) application (fig. 33 and 34).

TUTRAKAN 1916

VR reenactment of the epic battle of Tutrakan in 1916. The product is part of the museum narrative of the Tutrakan History Museum. Visitors learn about the history and artifacts associated with the city and when they reach the historic battle, they "relive" it

in virtual reality (fig. 35 and 36).

An exceptional product that is educational and educates responsibility and national consciousness.
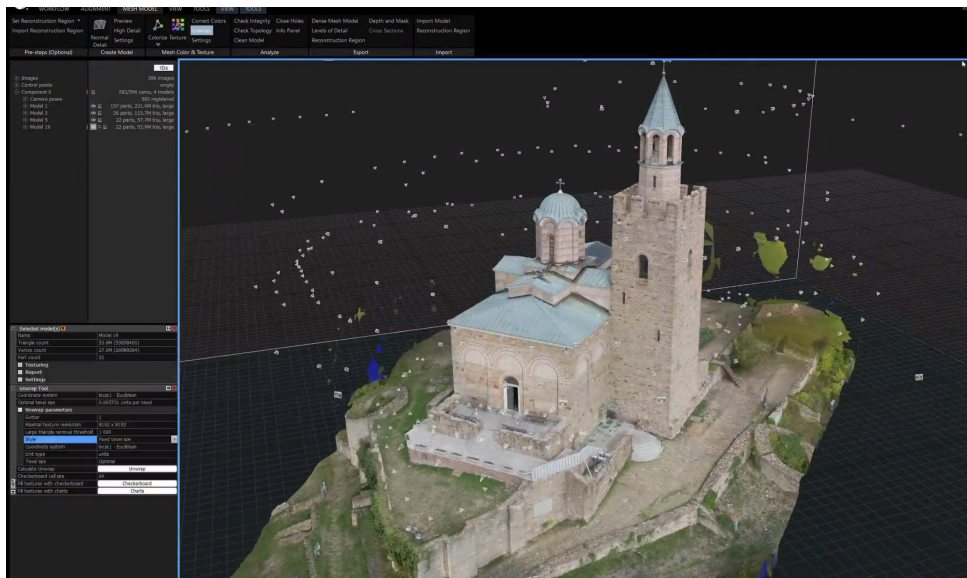

fig . 33

fig. 34

fig. 35

fig. 36

FUTURE BUS TOURS - VIENNA

A very innovative and attractive tourist product based on the cultural and historical heritage of Austria and VR.

Through VR technology, events and personalities related to different stages of Vienna's history are recreated. The experience for tourists takes place in several converted vans, which are equipped with swivel seats and virtual reality headsets. Tourists enjoy a real van ride in Vienna, and at certain points they put on the VR goggles and go back in time to events and personalities associated with that particular place. The production is a combination of real 360 degree 3D footage and computer generated effects (fig 37 and 38).

fig. 37

fig. 38

international exhibitions, tourist forums and conventions, as well as in tourist centers, during various events and advertising campaigns. The VR experience presents one of the most significant sites in the region in a modern way, standing out from the mainstream and outdated presentations. The product is realized in four languages, according to the international tourist flow and provides a complete "immersion" of the viewer in the different stages of the history and culture of the region, taking him through the different exhibition halls (fig. 39).

fig. 39

"THE MEDIEVAL MASTERPIECE - BOYANA CHURCH"

The unique frescoes of the Boyana Church are under the auspices of UNESCO. In order to preserve them for generations, they are kept under a strict conservation regime. Access inside the site is limited to 10 minutes and up to 10 people. And only specialists are allowed to the second floor. At the same time, the fame of the Boyana Church and the interest of tourists to it are really great. Virtual reality has made it possible to showcase this unique historical site in an appropriate and attractive way at a number of national and international events.

"ARCHAEOLOGICAL MUSEUM - VARNA. THE CALL OF CIVILIZATIONS"

An innovative VR product, with which the culture and heritage of Varna are presented attractively and memorably, both at

fig. 40

7. ART AND CULTURE

WHY VIRTUAL REALITY IN ART AND CULTURE?

Art and culture are about emotional experiences. In this context, virtual reality is the right tool to enrich various cultural events and present works of art in a different and innovative way, 24/7 and without geographical limitations.

The technology enables artists and digital copies of their works to be presented in a virtual environment - filmed or computer generated - where connoisseurs from all over the world can view and even meet in real time, in the form of avatars.

VR also allows the recreation of events that have already been realized or even the organization of such in real time in the metaverse.

ADVANTAGES

▶ A new type of experience;
▶ Virtual spaces accessible 24/7 via computer, smartphone or tablet, and for the ultimate immersive effect - a virtual reality headset;
▶ Ability to shared or guided a virtual visit;
▶ Curated online exhibitions and installations;
▶ Virtual spaces available for individual or group visits;
▶ Enables artists to share their work with a global audience.

CHALLENGES

▶ Space constraints;
▶ High costs for both connoisseurs and artists - for the former related to the organisation of the visit and for the latter to the maintenance of physical exhibition space and logistics;

▶ Inability for certain events to be repeated.

APPLICATIONS OF VIRTUAL REALITY IN ART AND CULTURE

VIRTUAL 360 DEGREE FILMS AND PRESENTATIONS
Virtual 360 degree films and presentations are a virtuoso way to promote culture and art. The feeling of being actually present and experiencing the emotion creates sensations in the viewer that are unattainable through conventional media.

VISITING PLACES AND EVENTS
Thanks to virtual reality, one can visit opera and rock performances, museums and galleries, cultural events, places where art is created and those where it finds application, and in concrete proximity and opportunity for interaction.

GALLERIES AND EXHIBITION HALLS
Virtual reality enables artists and collectors to present their works and products in the digital world in the form of:
▶ 360 degree capture of an existing gallery or exhibition hall
▶ An interactive virtual tour with the option to purchase and a "see in your home" feature;
▶ High quality scanning, photogrammetric capture and creation of 3D models of physical artworks and their placement in a virtual environment. Digital copies of artworks and historical objects can be stored and displayed without physical limitations;
▶ Creating NFT collections - The digital certificate of authenticity (irreplaceable token), or also known as the NFT, enables artists to market their works online, without copyright concerns and to an audience many times larger.

Creating virtual exhibition spaces has the following advantages:
▶ It is not tied to working hours and hiring physical staff;
▶ Availability 24 hours, seven days a week, 365 days a year;
▶ Expanding exhibition space and displaying many more artworks in the virtual gallery

- ▶ Increase audience - reaching visitors and collectors from around the world;
- ▶ Ability to display a past or current exhibition in a virtual environment - this is a very suitable solution for follow-up events related to anniversaries or others once they have been realized. VR is also suitable for attracting audiences/visitors during participation in an exhibition or other type of events that take place in another city or country;
- ▶ An alternative solution during a pandemic or other type of force majeure and related restrictive measures, travel bans or physical site visits.

MUSEUMS

The presentation of museums through virtual tours and 360-degree video is a very suitable approach. They preserve valuable historical artefacts that attract thousands of visitors a year and are most often on the itinerary of any new visitor wishing to explore the place and learn more about the history and culture of the city or destination, in general.

To make the visit even more fascinating, the physical exhibition can be upgraded with a virtual experience. A 360° VR video can tell the story of the objects and explain what they were used for, recreating characters or particular events from different eras. It's also much easier and safer to prepare a 360° VR exhibition space to bring together artefacts that are otherwise in different locations than to physically transport them to an exhibition hall. The visitor can move around the virtual museum at will, stop and look at objects that interest them, or have a personal virtual guide lead them through different time periods. Interactive exhibits, pop-up text windows, sound recordings and explanatory videos can be added to enrich the experience. All of this can also be accessed outside museum hours from anywhere in the world.

SUMMARY

The idea of combining virtual reality with art, culture and creativity is increasingly accepted and applied. The technology is gaining popularity in the presentation of artistic works and cultural events.

VR technology can transform various creative activities, such as drawing, traditional arts - painting, sculpture, etc., into digital arts, and also provide the public with more channels for a deeper understanding of the nature of art.

BEST PRACTICES

VIRTUAL GALLERIES

YourMeta.Art

YourMeta.Arrt is an innovative platform, a combination of different softwares and virtual spaces that provides artists and entrepreneurs with the opportunity to present their works and products in the digital world and dedicated meta galleries. The platform allows the virtual exposure of 2D and 3D digital copies of works, 360 degree tours, a "see in your home" feature based on augmented reality and much more (Fig. 41).
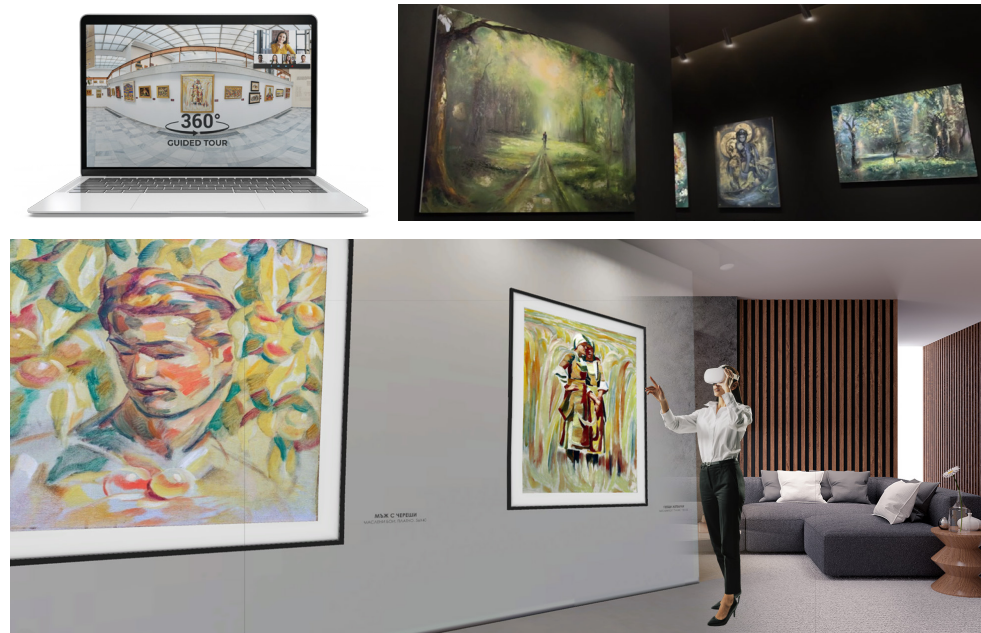

fig. 41

MUSEUMS

REGIONAL ARCHAEOLOGICAL MUSEUM - KYUSTENDIL

The museum management decides to make a step towards the digitalization of the expositions. In this regard, 360-degree virtual tours of all expositions have been created, as well as photogrammetric capture of artifacts and a pilot - a medieval church from the 11th century. These objects will be presented to the public in the form of 3D models (Fig. 42 and 43).
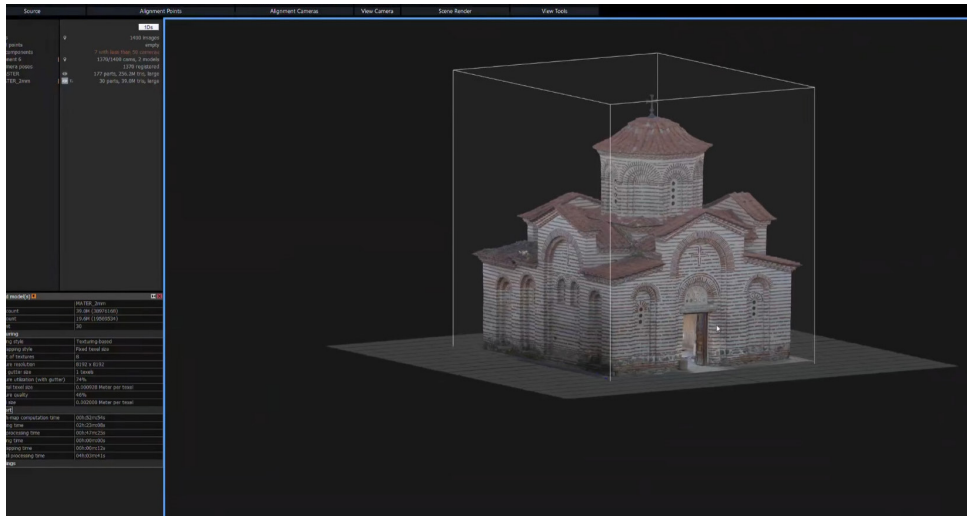

fig. 42

fig. 43

8. VIRTUAL SHOWROOM

The virtual showroom is a modern interactive digital "twin" of any physical store, retail or presentation space. It is a new generation virtual tour where the user can view and directly purchase the desired products. The ability to see an item from all sides and assess how it fits into a particular environment, combined with the ability to receive additional product information in the form of text, video or sound/voice, increases the propensity to purchase. An added benefit is the ability to have a real-time video call with a consultant, screen sharing, interactive promotions, promo games, etc.

The virtual showroom is an additional sales channel of a new generation. It is a new, interactive and highly attractive approach that will help the brand stand out. A virtual showroom on its own speaks much more than a series of pictures of a product, and when it is combined with a variety of interaction and choice options for the user, it significantly increases engagement, increasing conversions, call to action button selections and sales.

ADVANTAGES

▶ It is a new generation marketplace that combines the convenience of online shopping with the customer's sense of actually being in the store, but not only. The specialized software behind the platform provides capabilities that are new to online shopping;

- It helps companies be different. Online shopping is an ocean of countless, in most cases too identical e-stores in which customers quickly lose interest. The virtual showroom is a different, innovative and attractive additional sales channel;
- Operates smoothly and safely 24/7. The virtual showroom enables customers to visit a sales or presentation room, whatever the circumstances, at any time and from anywhere in the world. The software enables a consultant to assist users in real time when visiting the showroom.
- High quality and diverse digital content. A key advantage of the virtual showroom is the ability to integrate attractive content to best complement the offers - 3D product models, product videos and instructions for use, augmented reality, photos, GIFs, audio, surveys and texts, download files, etc.

CHALLENGES

- Increasing competition in the market;
- The development of multi-channel sales strategies;
- The oversaturation of consumers with uniform commercial offers;
- The difficulty of capturing consumer attention and achieving consumer engagement;
- Increasing costs of rent and maintenance of premises.

WHY DOES A BUSINESS NEED A VIRTUAL SHOWROOM?

An omnichannel retail strategy has long since become the standard. In recent years, under pressure from the constraints associated with the pandemic, businesses have begun to look for new ways to improve their performance.

The three pillars of retail success are:
- Personalization;
- Experience;
- Storytelling.

A unique way to combine these three elements is to create a virtual experience.

SUMMARY

The virtual showroom offers an engaging way to showcase products along with an attractive presentation of product details. Pandemic has fundamentally changed the way people interact with businesses as well as their shopping habits and patterns. Research shows that people are still not very confident about buying goods online when they are only presented in a 2D environment, as the perception of them is limited. Virtual stores allow for a more successful presence and personalized approach by creating a new type of brand experience online.

BEST PRACTICES

VR Showroom GEBERIT

The world-famous bathroom furniture company Geberit has created a virtual showroom where you can get to know the products and the technology behind them. Visitors can learn about the company's products and services by clicking on the locations highlighted in the virtual tour. The virtual showroom itself is a 3D-generated environment with product visualizations, information points, text, videos, images and other information, as well as a link to specific products in Geberit's online store (fig. 44).

VR mall BG

Online platform for virtual stores of different types, which provides a number of functionalities, such as integration of all kinds of information, video, augmented reality, 3D models of products, the possibility of direct purchase or integration with an existing online store, download documents, etc. (fig. 45, 46 and 47).
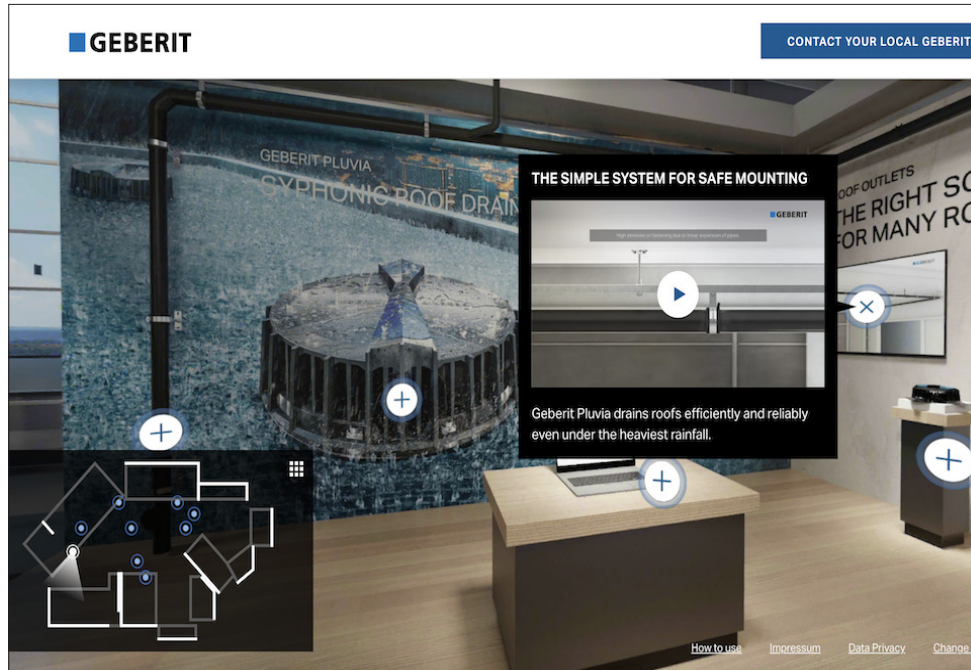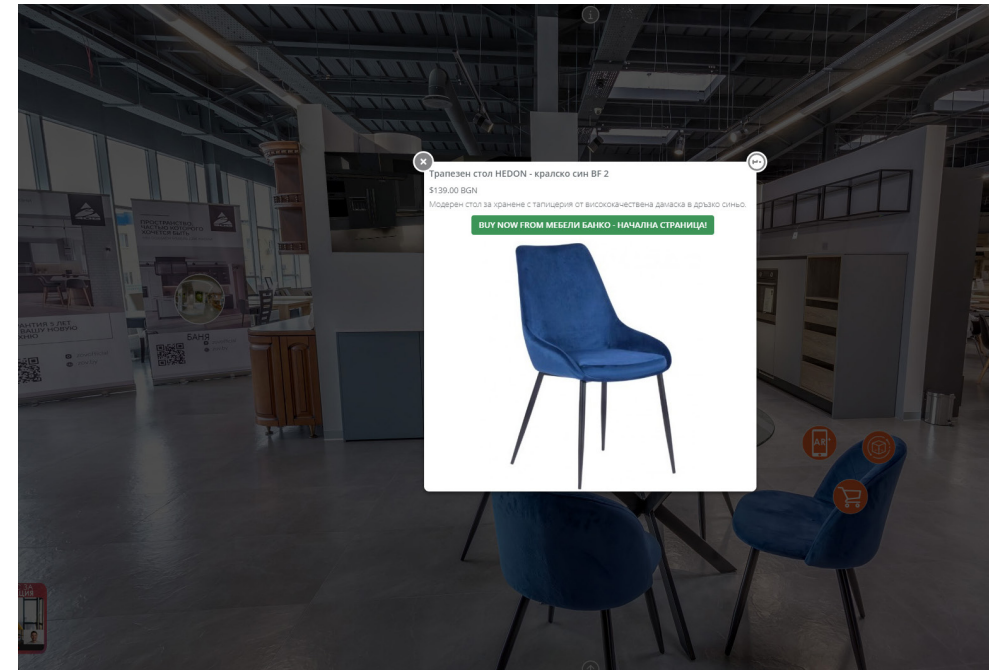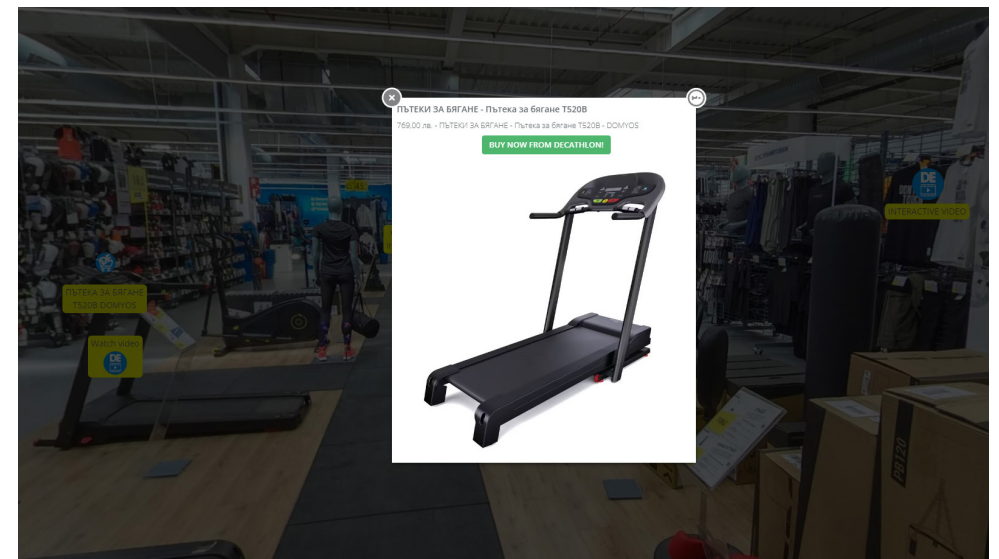
fig. 44

fig. 46

fig. 45

fig. 47

9. SALES

SELL AN EXPERIENCE, NOT JUST A PRODUCT

Sales is facing a fundamental shift: never before have companies had so many different channels and ways to reach their potential customers. But this oversaturation is leading to more competition. Today, it's more important than ever for companies to stand out from the crowd and stay top of mind with their target audience. To achieve this, it's important to be in demand and up-to-date with the right technologies.

Virtual reality has everything it takes to revolutionize the sales process, as well as benefits that are crucial in every phase of customer interaction.

Emotion sells, but to continue optimizing the sales process, emotion and method must be combined.

VIRTUAL SHOWROOM

In the last few years, a number of companies have resorted to creating virtual showrooms - digital twins or upgraded models of their stores. They are basically of two types, according to their functionality and structure - online virtual stores and dedicated applications.

ONLINE VIRTUAL STORES

Online virtual stores are cloud-based and can be accessed from anywhere in the world via a smart device with internet. They do not require software to be downloaded and installed. They can be made up of 360° panoramic images of real premises or of specially created 3D panoramic visualizations generated for this purpose. Both have their advantages - with panoramic photos one has the feeling of a real environment, while with 3D visualizations, one has the feeling of a computer generated environment. The second type may look a bit less realistic, depending on the quality of the visualizations, but on the other hand it can be the ideal model of a store to have any physical characteristics. In both cases, these virtual showrooms allow the viewer to explore the product portfolio, download catalogues, 3D models or other information, see a product in the room they are in via AR technology and purchase it directly.

The advantage of a showroom that is created from 3D visualizations is that the company may not actually have a physical one, but can virtually display as many and as few of its products as it wishes. This enables even the smallest of businesses to sell, through a virtual experience, without investing a huge amount of money in buying/renting and furnishing retail space.

SPECIALISED VR APPLICATIONS

The second type - specialised VR applications again enable us to take advantage of key functionalities in the sales process, the main differences with the first type are two - the viewer has the opportunity to model the products - for example, if he chooses furniture, he will be able to change the colour of the cabinet or the materials from which it is made. The other important difference is that this type of apps require downloading and installing on a smart device or computer, and depending on their complexity and scope, they may also require more special hardware.

TRAINING FOR SUCCESSFUL SALES

Another important application of VR, in the context of sales, is the upskilling of the employees involved.

We all know that one of the most important factors in successfully closing a deal is the human factor. To be well prepared, employees need to go through a proper training program. Through virtual reality trainings, employees can practice advertising proposals in an environment that matches the real one as much as possible, without their decisions affecting the company's image in any way. They can be repeated as many times as necessary and regardless of where employees are located.

Selling complex products to potential customers is not always easy. In some cases, these products are heavy or bulky and cannot be transported quickly and easily, or at a reasonable cost to demonstrate their capabilities and vision. Presenting a product or service through a catalogue, brochure or PowerPoint presentation can be difficult, incomplete and even boring.

ADVANTAGES

▸ Can turn an advertising campaign into a fun experience;

▸ Reduce sales-related costs - potential customers can learn about products and their features without incurring large costs for logistics, renting/purchasing large exhibition space, and creating trivial and low-cost paper promotional materials;

▸ Presenting the product/service in an innovative way - With VR, products and services can be showcased in a completely innovative way, in addition to giving customers the opportunity to become more familiar with the benefits, features and everything they need to know about the product/service;

▸ Shortens the sales cycle - Online shopping has already revolutionized sales. VR builds on this revolution, allowing consumers to have much better and attractive access to the showroom and products from the comfort of their own home;

▸ An additional tool to enhance employee skills - as already mentioned in various chapters of this document, the use of VR in the training process allows for multiple repetition at no additional cost and achieves a higher rate of retention because of so-called learning by experiencing. Increasing the skills of employees involved in sales will inevitably lead to a financial result for the company as well;

▸ An additional sales channel - last but not least, a VR showroom or other type of sales experience will be an innovative and attractive addition to any company's toolbox for reaching the customer and selling the product;

CHALLENGES

▸ Dynamic market and high competition for the attention of potential customers;

▸ Development of multi-channel sales strategies;

▸ High cost of physical premises;

▸ Too high a cost to position a large portfolio in a physical location;

▸ Difficulties in displaying bulky or specific products or equipment;

▸ Need to increase employee skills, experience and knowledge related to the sales process;

▸ Logistics constraints.

APPLICATIONS OF VIRTUAL REALITY IN SALES

Virtual reality transforms standard sales presentations into in-person experiences. In an oversaturated world where any video content, clip, or the latest mobile game is just a few clicks away, experiences are considered the most important currency.

According to a study by the German company VRdirect, this is evidenced by the following six facts, which illustrate the changed purchasing behaviour in a digitalized world, and at the same time present opportunities for companies that dare to rely on new technologies.

1. More than half of potential customers want to see how a product works the first time they encounter it (and only 23% of salespeople are prepared to do so). If a business can provide the important information about its products in the "Attention" phase of the AIDA model (see page 14), where the potential customer can understand clearly and remember, it gives its salespeople a powerful tool to present the product in the best possible way - without losing the "ease" of the first conversation.

2. 19% of customers want to talk to a salesperson about the product already in the "Attention" phase. In most cases, they are looking for product presentations or want to participate in a product demonstration right at the beginning of the "customer journey" on the path to making the sale.

The common perception of salespeople is that the product demonstration is often seen as the last action they take to win the customer. According to HubSpot (an American inbound marketing software development company), one-third of buyers want to have the opportunity to see a product in action very early on - a particular strength of virtual reality.

3. 60% of customers want to do their own research during the "Interest" phase and only then contact the seller. This is where virtual showrooms are extremely suitable. Virtual reality can provide a high information density of the content presented, leading to a better customer perception of the information and a favourable development of the transaction.

4. Seven in ten B2B buyers watch a product video at some point in

the buying process.

5. Videos related to product features are the most popular, followed by tutorials on how to use them and professional reviews. In classic media channels, however, companies compete with other providers' content, while the attention of the customer who is immersed in a virtual environment is fully engaged by the product/service being presented through VR.

6. At least 50% of the alleged stakeholders do not belong to the target group.

There are cases where the employee realises at a relatively late stage in the sales process that the potential customer does not need the product or service offered. This still happens all too often and can only be prevented by a professional, early and clear transfer of information without expending too many resources in the "Attention" phase.

VR IMPROVES SALES IN EVERY PHASE OF THE PROCESS

There is hardly any other technology on the market that supports the sales process through all phases as effectively as virtual reality.

Using VR solutions in sales maximizes the density of information transmitted and received in the Attention phase without using too many human resources. In the "Interest" phase, sales staff have the opportunity to make more targeted presentations and deliver the right information at the right time.

As already mentioned, VR has a very important quality - the ability to "immerse" the viewer completely in the experience, thus facilitating a longer and more complete perception of the information, leading to an increased understanding of the product or service, and its potential to solve the customer's problem.

SUMMARY

Incorporating virtual reality into a sales strategy can help shorten the sales cycle in two ways:

▸ First - as mentioned earlier, employees/sales reps will be better prepared by going through different VR sales scenarios. As they are confident, their effectiveness in terms of sales will increase.

▸ Second - creating a virtual showroom can save significant costs, help reach a significantly larger audience to whom products can be presented in a visibly different and attractive way, which will naturally lead to increased sales and customer satisfaction.

▸ Thirdly, VR presentation will help potential customers get the information they need more quickly, clearly and attractively. Custom products, for example, can have long and difficult sales cycles. Because each buyer has customized requirements, the company can find itself in an endless round of reconfigurations. But when the customer is presented with a complete, realistic product visualization on their configuration, it can save a number of misunderstandings and shorten days or even weeks of the sales cycle!

BEST PRACTICES

Porsche - Panamera VR

Porsche demonstrates how virtual reality can be used for innovative product presentations with content created for the Porsche Panamera VR. Instead of simply showing product specifications, images and videos, the German automaker puts the user directly behind the wheel. Not only does the user get the most important information(fig. 48), but they also "experience" the Panamera in action: up close, on the race track (fig. 49).

IKEA

IKEA created their own VR app that allows visitors to "immerse" themselves in different virtual room models, choose furnishings, change wall and furniture colors, fabrics and other features. In this way, visitors get a much clearer idea of colour combinations and how suitable a product would be for their home (Figures 50 and 51).

fig. 48

fig. 49

fig. 50

fig. 51

10. REAL ESTATE

VR/360° photo and video presentations and Virtual Decorating are exceptional presentation tools for selling and renting real estate. With VR, any property can be presented in its perfect condition, at any time of the day and to potential clients who are miles away. This product is very suitable in times of limited mobility, saves time and money, helps buyers/tenants to imagine the property in the best way and with the feeling of being physically present in it. VR technology also allows interested parties to "visit" virtually a property that is under construction or even at the planning stage.

WHY VIRTUAL REALITY FOR THE REAL ESTATE MARKET?

Presenting a property in a VR/360° environment is a modern and significantly more attractive way to promote online, compared to traditional photos or 2D videos.

The technology allows to significantly reduce the cost of money and time in property viewings, while reaching a wider audience.

VR can be used to showcase an existing property or one that is under construction or at the design stage. People, for the most part, can't imagine what a property would look like from just

photos or a drawing. VR solves this problem by allowing the buyer to "teleport" into the home to get a feel for the volumes and see different furnishing options. This significantly increases the chances of making a sale.

VR presentation allows buyers and investors to "transport themselves" and view multiple properties from the comfort of their office or their agent's office, narrowing the choices for actual viewing to only the properties that truly interest them. The technology allows demo attendees to meet in the virtual environment as avatars, with investors/traders better able to present a site and buyers able to ask their questions.

The costly, time-consuming and often highly organised process of on-site viewings is largely eliminated.

Virtual presentations can help sell any type of real estate, from houses and apartments to offices, commercial and industrial buildings/spaces.

The technology allows a large number of people to virtually visit a large number of properties. Within minutes, the customer is "transported" to different sites and assesses which ones are worth visiting in person.

Goldman Sachs forecasts that the portion of the real estate market related to VR and AR globally will reach $80 billion by 2025.

This forecast is pre-COVID-19 and a significant increase in forecast value is expected in light of the new realities.

According to a study by VRARA (World VR/AR Association):

- 40.4% of apartment buyers confirmed that VR tours played an important role in their purchase decision;
- 72.7% of the clients who were offered a virtual tour by their builder/broker rated this tool as extremely suitable;
- 64.4% of property buyers confirmed that the 3D and VR/360° content helped them to feel and get a real idea of the room sizes in the properties.

ADVANTAGES

- Saves time and money;
- Gives the customer a real picture, including condition and dimensions;
- Creates an emotional connection and sense of ownership;
- Offers global access;
- Enhances the image/recognition of companies that use it.

CHALLENGES

- Physical remoteness of sites;
- Increasingly dynamic daily life;
- Higher travel costs between locations;
- Inability to get a real sense of the property from photos or video;
- High competition in the real estate market.

APPLICATIONS OF VR IN REAL ESTATE PRESENTATIONS

360 degree real estate photography

360° photography allows the creation of interactive VR tours where the user chooses which room to visit and view in detail.

In this type of tours it is possible to integrate various information about the property, such as dimensions, plans, characteristics of flooring and other materials, furnishings, if any, etc.

The advantage is the "freedom" of the potential buyer/tenant to view the property as they would in a real situation.

VR video for real estate

This type of VR presentation allows the creation of a virtual video tour with a host - a real broker/agent or actor.

This way, the virtual host will "walk" their clients through the property as they would in reality. In his narration, he can emphasize all the important details about the property, some of which can be illustrated with additional embedded multimedia elements such as floor plans, detailed images, parameters, videos, etc.

VR visualizations of properties

VR/360° visualizations are computer generated images - photorealistic interiors and exteriors of buildings that are in the planning or construction stage.

A 3D tour or 360° video can be created even just based on architectural plans and designs. This allows potential clients or investors to get the most realistic view and feel of a property before it is completed. This greatly facilitates the presentation of the object and its realization.

Real-time virtual meetings and presentations

Virtual reality enables planners, investors, agents and potential stakeholders to come together in real time, regardless of their distance.

The technology allows 3D objects, visualizations, 360° photos and videos to be presented in a virtual environment while all meeting participants are together, communicating and interacting with each other and the digital content, no matter where they are in the world.

It is a next-generation remote interaction tool that has the potential to transform a range of sectors and relationships.

SUMMARY

Virtual and augmented realities are transforming the real estate business so much that they are becoming the standard for the world's leading agencies. One of the main reasons virtual reality has become so popular in this field is that it saves time for both brokers/agents and property buyers. This type of presentation is accessible from anywhere in the world and at any time.

BEST PRACTICES

Sotheby's is among the companies successfully using VR tours for real estate marketing. It's no coincidence that luxury property sellers are pioneering the use of VR. The reason for their interest in the technology is the high efficiency of this tool when dealing with sophisticated/difficult clients who do not have enough time to visit extremely expensive properties, while at the same time wanting to have enough complete information about the property (fig. 52 and 53).

One of the UK's oldest property companies, Strutt & Parker, part of the BNP Paribas Real Estate holding company, has successfully used VR for property sales. The company's salespeople value VR because with the same impact the same experience can be used with clients located in London as with those in Singapore. In other words, virtual reality shortens distances, which is a very important element in today's global world.

fig. 52

fig. 53

11. INDUSTRY

Digital technologies are playing a critical role in the rapid growth of various industry sectors, spanning all business functions. The advent of new technologies such as Virtual and Augmented Reality is revolutionizing the way business is conducted across a wide range of sectors of the economy such as energy, oil and gas, natural resource extraction, infrastructure projects, manufacturing, healthcare, aviation, education and training, tourism, etc.

ADVANTAGES

▸ Visualization of objects - VR is the best tool available for visualizing objects and spaces that don't yet exist, and with the feel of real dimensions. With the help of VR technology, any person can "transport" themselves into a 3D-model of a workshop, factory or infrastructure site, view the construction plans in a truly unique and understandable way, regardless of education and professional experience.

▸ VR is also suited for a synthesized representation of industries and processes, enabling the viewer to 'be present' at all stages of a product's creation and to visit production facilities they would not otherwise have the opportunity to - whether for safety reasons or corporate information security requirements. In this type of presentation, certain processes can be presented while others that are company secrets remain out of the viewer's reach.

▸ VR presentations of industrial sites and industries are also extremely suitable for so-called onboarding, enabling new employees to learn important information and procedures in a short time and in complete safety.

▸ - The technology offers a number of advantages and is also increasingly being used in recruitment campaigns, with the aim of presenting career opportunities within a company in a compelling way.

CHALLENGES

▸ The industry is a very specific sector that requires a serious approach in every aspect - from safety rules and procedures and certain work processes, to proper presentation to partners and the general public, to specifics related to data protection and corporate secrets;

▸ Large companies often develop initiatives to make the public aware of their activities. So-called 'open days' are organized during which visits to production processes are carried out. However, this creates a number of difficulties and dangers - employees are engaged to accompany visitors, time-consuming safety briefings are carried out, work processes are subject to the presence of outsiders. These events are part of companies' corporate social responsibility and public relations, but create significant operational bottlenecks.

▸ One of the main challenges of today is the shortage of personnel. Companies from all economic sectors are competing for their attention and striving to attract the right talent. To do this, they need to build their employer brand and present it very well to potential stakeholders

APPLICATION OF VIRTUAL REALITY IN INDUSTRY

Virtual reality provides a solution to all these challenges. It can digitally transform a wide range of activities in an industry context. The technology is mainly used in four areas:

Engineering and design

The stage of creating a prototype of a product is usually an integral part of the design process in manufacturing.

Creating a product prototype can be a costly process, especially if the product is a complex facility. In the event that refinement is needed, the cost can increase even more. Creating a prototype in virtual reality can offer huge benefits. The overall cost can be less than creating a number of physical prototypes, even after factoring in the cost of developing the virtual reality application.

Training

Virtual reality training for industry is one of the most successful applications of the technology.

They can be classified into three categories:

- VR training
- Facilities related training
- Training related to specialized operations and standards

Inspection and quality assurance

Virtualised data is increasingly used and important in many industries. For example, in the mining sector or infrastructure construction, a very useful tool is the photogrammetric capture of a terrain and its conversion into a 3D model. If carried out with the necessary professionalism and accuracy, this capture provides invaluable data that serves as a basis for planning or inspection. An example of this is the ability to calculate exactly how many cubic meters of material is an embankment or, based on a series of photographs, to create a model of which direction a vein of valuable ore is spreading.

Repair and maintenance

Visualizations and information to assist with tasks related to equipment maintenance or repair:

- Reference videos and digital manuals

  Manufacturing companies have begun to provide VR training content that places the viewer in an interactive virtual environment where they can learn about the operation of a machine or piece of equipment, experimenting with it without the risk of damage or injury.

- Remote expert assistance
- Often, companies need to invite experts from the company that manufactured the equipment - to perform a scheduled or emergency inspection. Such inspection visits are usually costly and require careful anticipation and determination of the time range in which to carry it out.

- The manufacturer can avoid sending an expert to the machine by using virtual reality. The technology enables 360 degree live streaming, where the inspector has full visibility of a particular process or facility.

- Visualize specific components and functions beyond physical barriers;
  Virtual presentation of components that are either in an inaccessible location or are too large or small.

Planning of areas

When planning the area for assembly lines or production shops, various elements need to be considered, including the size of the equipment, the connections between different components, safety clearances, electrical outlets, power line entrances, and many other things. A virtual model of the room and equipment layout can save considerable money and effort by allowing pre-testing of the operation of the entire system.

Presentation of specific/heavy equipment

Heavy equipment manufacturers who present their products at trade shows and exhibitions usually have difficulty setting up a presentation space at the venue. The manufacturer has to think about transporting, connecting and using the machinery at the exhibition and last but not least, safety.

A machine can require a large space and weigh several tons, resulting in additional costs for logistics and organization. In addition, heavy equipment is usually produced in response to specific requests and not kept in stock. By creating a VR zone, visitors to an exhibition or event can be shown the technology in action without the risk of danger to them.

SUMMARY

The applications of virtual reality in industrial manufacturing are many and solve significant problems. It can be applied in all processes and business functions namely - design and engineering, business development and marketing, project management, training, supply chain management, inspection, commissioning, maintenance and troubleshooting, site operations, health safety and environment, quality management etc.

BEST PRACTICES

AURUBIS BULGARIA

The Aurubis Bulgaria manufacturing company has over 60 years of history.

Since 2007, it has been part of the Aurubis Group - Europe's largest copper processing company with nearly 7,400 employees, operating production facilities and a sales network in 24 countries on three continents.

Interest in the production activities at one of the largest plants in Bulgaria is high and the company organizes open days where external visitors can take part in an organized visit to the plant. These visits arouse great interest, but create significant difficulties for the team. Metallurgical production is a very complex, responsible and dangerous process and the visits require a great deal of organization, coordination and carry certain risks. Before each visit within the plant, visitors are given a forty minute safety briefing.

The company decided that the VR presentation would eliminate many of the inconveniences associated with physical visits to production areas, while also introducing viewers to processes they might not witness (fig. 54).

BMW
PROTOTYPE DESIGN IN VR

Engineers and designers at BMW use VR to collaborate effectively, testing how different components of the car look and interact when assembled. This is done even before the physical prototypes are created, significantly reducing the cost of the prototyping process.

FORD

The company is using VR in different areas. One of the interesting applications is the simulation of human movements in certain processes. They use VR technology to identify and design alternative employee actions based on data from body motion sensors during the assembly of the vehicle and its components. The aim is to reduce the risk of injury and increase productivity. As a consequence of the application of VR, there has been up to a 70% reduction in employee injuries and a 90% reduction in ergonomic problems.

Another application they see is sales. They have created a VR application that allows potential customers to "feel" what it is like to be in their vehicle.

fig. 54

fig. 55

fig. 56

12. FASHION

Virtual reality has widespread applications in the fashion and retail industries, allowing shopping to become more interactive, immersive and creative than ever before. Many fashion brands are working on creating new experiences to provide customers with a different and interesting journey into the world of fashion, to make the shopping experience unforgettable, unique and completely relevant to their personal tastes.

From testing variations of fabrics and colours for the production of a fashion line, fashion shows in virtual reality, presenting the "story" of the brand and production processes, to virtual stores and promotional campaigns.

ADVANTAGES

- ▶ Allows the average person to learn about the processes involved in creating a garment, a collection and an entire brand in a way that will create a stronger connection with the brand;
- ▶ Makes it possible to attend a fashion event remotely or after it has already ended;
- ▶ Provides the opportunity to create a virtual fashion boutique with 3D models of the items;
- ▶ Enables certain processes to be presented as a training product as well.

CHALLENGES

- ▶ Multiple fashion brands on the market;
- ▶ High level of boutiques;
- ▶ High customer demands;
- ▶ High prices for renting and buying retail and exhibition space;
- ▶ Globalization of the market;
- ▶ Inability of wider audience to attend certain fashion events.

APPLICATION OF VIRTUAL REALITY IN THE FASHION WORLD

As in any other sector, it is important to create a qualitative and different representation of the brand and products. Consumers are increasingly savvy and demanding. For a brand to succeed in capturing the attention of the public, an innovative approach is needed to reach people, hold their attention and engage them with the brand.

VR BRAND PRESENTATION

A very interesting application of the technology would be to place VR headset in the boutiques of the brand, allowing visitors to watch a 360° panoramic video presentation of the entire process of creating the clothes, to be present in the designer's studio while creating the models and cuts, to learn about the process of choosing fabrics, sewing, etc. Such an experience will create a much deeper connection between the customers and the brand. (fig. 57).

STORE DESIGN AND LAYOUT

The application of virtual reality in the fashion world is also related to the planning of boutique design and layout to find the most optimal and workable option. By recreating branded stores in virtual reality, fashion companies can try out different designs and layouts until they settle on the option that best suits their needs and the preferences of their customers. Although virtual reality can be an expensive solution, it's still more cost-effective than physical store redesigns, only to find that the design doesn't work as well.

DESIGN OF ITEMS AND ACCESSORIES

VR technology can also be used to design a brand's items and accessories. For example, before actually producing a handbag in a new colour, a fashion designer tests it in VR to see if it is as spectacular as she expects.

VIRTUAL STORE OR ADVERTISING CAMPAIGN IN VIRTUAL REALITY

Building a virtual boutique would set the brand apart from the competition. Such a product could save significant time and money.

SUMMARY

More and more fashion brands are using virtual reality technology in creative and innovative ways, weaving it seamlessly into their product presentation and marketing strategy, creating interactive and "immersive" experiences that aim to increase customer satisfaction, strengthen and improve brand recognition, and take the industry into the future.

BEST PRACTICES

DIOR EYES

Back in 2015, Dior used virtual reality to create the Dior Eyes experience. It allows users to "peek" behind the scenes of a fashion show in a virtual environment. This approach allows customers to get up close and personal with the brand in an unconventional way and be part of an event they might not otherwise be able to experience (fig. 58).

NEW YORK FASHION WEEK (fig. 59)

Back in 2017, during New York Fashion Week, visitors were given Samsung virtual reality goggles that transported them to an Italian city, while digital mannequins presented the various collections. This new approach is generating a lot of interest, as it is different from the way brands have presented fashion before.

BALENCIAGA

Since the start of the Covid-19 pandemic, virtual reality has become an increasingly popular choice for presenting fashion shows. In 2020, fashion brand Balenciaga is staging a VR show for its A/W2021 collection, providing a new and innovative way for guests to experience the latest designs from their collection from the comfort of their own home. In this way, the excitement of the catwalk is brought directly into people's homes, giving them the unique opportunity to be part of a high-end fashion event.

fig. 57

fig. 58

fig. 59

III. SUMMARY

According to a PriceWaterhouse study, VR and AR already contribute over $46 billion to global GDP. More and more companies globally are integrating these new technologies into their business processes and advertising campaigns, and the benefits are real.

Five tips to heed when a company is ready to integrate virtual reality into business and marketing strategy:

1. Creating a VR product should not be an end in itself. It is usually part of a larger toolkit. The VR experience needs to be conceptualised so that it makes real sense and delivers real benefits. A specific business problem needs to be identified and solved, for example, using the technology to present more attractively and successfully at exhibitions, speed up workflow, improve employee safety, build on knowledge, reduce costs or open up new revenue streams.

2. Technology is only one part of the overall VR product. Understanding its capabilities and creating an effective concept for its use are key to realizing a quality product, but it must be tailored to the specifics of the particular project.

3. The VR experience created for a company's purposes must be easy to perceive and comfortable for users to use (in terms of the quality of the captured or computer-generated material, the software used and the model of virtual reality goggles). The use of low quality content and equipment can have the opposite effect.

4. The best way to see the benefits of the technology is to launch with a pilot product to show to what extent the results of using VR meet expectations and the desired effect.

5. The outcome of the pilot programme needs to be measured and analysed. The next steps should be based on the feedback received - to make a bigger investment in the virtual experience already created, to create a complementary or completely different one, depending on the future goals.

VR technology offers an innovative delivery of any company's message. It creates exciting new ways for consumers to interact with a brand or product. They are given the opportunity to not just be passive observers and consumers, but active participants.

This builds a stronger relationship with customers and employees. It is an innovative approach that provides a different experience for customers and partners, leaving a lasting impression on them.

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