Immersive Reality

An Overview of Augmented and Virtual Reality Applications for SMEs and Beyond

Introduction

Digitalization, or at least a viable digitalization strategy, is an unavoidable component of successful business in the information age. The shift to online and virtual contexts was occurring rapidly even before the Covid-19 pandemic, which presented an impetus for even the smallest SMEs to implement modern technology like electronic payment, digital marketing, and more efficient electronic communication. Since the latter part of the 2010s and especially in the first years of the 2020s, the technological market has boomed with virtual and augmented reality solutions.

A hint at this development was on strong display during the Covid-19 pandemic. As web conferences and online meetings became vital lifelines for many companies, universities, and private persons, the platforms able to host these meetings matured and became more accessible. Beyond the mainstream services like Skype or Zoom, which offer breakout rooms, virtual event platforms sprouted up. Entire virtual worlds emulated spaces like lecture and conference halls to give participants a stronger feeling of presence. Within these spaces, participants can move around as avatars from room to room, actually "sit" in on talks, and move their avatars to one another to engage in individual or group discussions. These are, however, simply intangible virtual worlds, a stepping stone to the metaverse. Until we get to the metaverse, however, immersive realities are looking to close the gaps between the physical and virtual.

Immersive Media

Immersive media directly affect the way in which users or consumers see and experience their actual environment by combining the real and the virtual to produce a virtually enriched, yet tangible, experience. The technologies can be considered along a continuum, bookended by augmented reality on one side and virtual reality on the other.

Augmented reality expands upon objects in the real world by adding virtual data to them. Perhaps the most current examples of augmented reality can be found on social media. Two notable platforms are Instagram and SnapChat: users can apply filters to their own or others' faces which add things like accessories, bodily features, animal features, moods, holiday-specific themes,

and much more. As soon as the filter or device through which augmented reality is applied is taken away, these features vanish again. Virtual reality, on the other hand, is a fully immersive experience. Unlike an online conference, virtual reality helmets or goggles allow a user to step into the world and experience it in 3D. The user is the avatar that they would normally just control with the click of a mouse.

Mixed reality is a hybrid of AR and VR, neither completely immersive nor confined to physical reality. Unlike augmented reality which virtually overlays objects with more information, new objects can be inserted into an environment with mixed reality. A recent example is the popular game PokémonGo, which became a worldwide phenomenon in 2016. The game transforms your physical location into a Pokémon world—landmarks, buildings, and routes with little significance to players before the game turn into places of interest where one can catch Pokémon, have battles, or meet up with other players. Pokémon appear your screen seemingly out of nowhere in the grass or on the street right in front of you.

These examples show the prevalence of immersive medias in mainstream media and entertainment, but their growing popularity across almost all industries and sectors highlights just how heavily they will influence how we conduct business and consume products in the future.

Multifaceted Applications Across Sectors

Industry 4.0—Manufacturing, Maintenance and Service

Industry 4.0 is the new age of industrial revolution, geared towards smart automatization and digitalization in manufacturing and beyond. It increasingly blurs the lines between the physical and digital worlds by interlacing people, machines, logistics and communications to optimize production lines. Augmented and virtual reality applications can be found within the areas of display interaction technology, tracking, human-computer interaction, object detection, recognition technology, calibration, model rendering, system modelling, analysis technology, and collision detection. [1] From the manufacturing and maintenance sectors' perspectives, AR and VR offer time-saving and cost-reduction processes.

Smart glasses are a great example for augmented reality solutions in the service industry. When working on a repair or the assembly of specific components, the glasses blend in specific information about parts or assembly instructions. This is particularly helpful for field technicians, as it eliminates the need to consult handbooks or call specialized colleagues for help, which can reduce the number of technicians needed for a job, and can be used for training purposes.

Particularly within the context of manufacturing and maintenance, immersive reality solutions are being hailed as the key to closing the knowledge-gap between the younger and older

---

[1]

Damiani, Lorenzo, et al. „Augmented and virtual reality applications in industrial systems: A qualitative review towards the industry 4.0 era." *IFAC PapersOnLine* 2018: 624-630. Web.

workforce. Older colleagues who have not been exposed to the same technologically advanced training as those entering the workforce can receive user-friendly, hands-on training by way of virtual or augmented reality.

Fashion Industry

The fashion industry is also rapidly adapting to the digital future and the realities of online shopping. Already in 2017, Anna Rojahn[2] presented virtual reality solutions in the luxury fashion sphere at Fashiontech Berlin. At that time, live fashion shows were already being virtually expanded with augmented reality, whereby audience members could point their smartphones at the catwalk and see extra features around the models; Prada was experimenting with virtual reality app, raising questions about how virtual reality can be implemented as a story-telling mechanism around collections.

For non-luxury clothing retailers, smart mirrors and virtual fitting rooms are offering consumers a way to try on clothing and accessories without actually having to touch them. The American brand Walmart currently uses an augmented reality technology originally developed by Zeekit, which allows buyers to see how items of clothing fit without trying it on themselves. With "choose my model," consumers can pick a model closet to their own body type and see how the article fits.[3] This and similar solutions became very popular during the Covid-19 pandemic when physically shopping in stores was impossible. For online clothing shops, these types of virtual fitting rooms are also more economical—they help reduce the number of returns because consumers are more likely to buy clothing that fits. In physical stores, smart augmented reality mirrors scan passersby with a webcam and overlay the scans with clothing or accessories. They eliminate wait times for normal fitting rooms and offer a unique marketing strategy within the store. Show windows can also be outfitted with augmented reality to make mannequins come to life or blend in more details about products displayed.

Architecture and Design

Immersive reality has also found its place in the home design sector. Big-name home goods retailers like IKEA and Wayfair (amongst many others) have already developed augmented reality apps that allow users to visualize specific pieces in their homes. A user simply has to point their device at the room or space and a virtual 3D model of the product is projected into the picture.

While 3D design apps are still popular for architectural design and allow users to design spaces inside or outside of their homes online, virtual reality goggles are an attractive solution for physical design studios. Clients get the best of both worlds: they meet with planers in person to design their space—bathroom, kitchen, garden, etc.— giving them the 1:1 attention and

---

[2] Rojahn, Anna. *Augmented & Virtual Reality for the Fashion Industry*. FASHIONTECH Berlin, 23. January 2017. YouTube.

[3] Incandela, Denise. *Walmart Launches Zeekit Virtual Fitting Room Technology*. Walmart, 02. March 2022. Web.

assistance unavailable online, then they can experience the space's feel and functionality for themselves instead of relying on a screen.

Simple and Cost-Effective Solutions for SMEs

Nearly every application presented in this paper is readily available on the market and can be customized to fit an SMEs need. Furthermore, there are a number of easy solutions available to those unable, or for whom it is impractical, to invest time or money into complicated programs.

AR and VR provide innovative ways for SMEs stay competitive and are becoming increasingly accessible for companies with little time and/or budget. Hardware like virtual reality goggles or smart glasses are more affordable than in years past, with virtual reality glasses by PlayStation available for about €300.

Social media can also offer SMEs a quick and easy opportunity to use augmented reality for marketing purposes. In 2017, Meta launched its own open access augmented reality e-learning platform, SparkAR, through which SMEs can create their own filters to use on Instagram and SnapChat. The site takes users through the AR process step-by-step in laymen terms; for users less interested in using Meta's platforms, Spark is a free and convenient introduction to AR and programming. Another simple solution is augmented reality business cards. There are a variety of ways to create and program AR business cards to suit the budget and knowledge base of any SME.

Conclusion

Introducing immersive reality applications to SMEs is no longer some futuristic idea—the technology is here, now, and more accessible than ever. They are not only capable of increasingly an SMEs visibility and offering customers creative ways to engage with their products, they're future-safe and even sustainable. Less paper and less travel, just to name a few advantages of immersive medias, mean reduced consumption of nonrenewable resources and environmentally friendlier business practices. This is a prevalent topic in business and politics which must be taken into consideration as we move forward in the digital age.

The aftermath of the Covid-19 pandemic has inspired the market with innovative immersive solutions. Now is the time for SMEs to capitalize on this energy and invest in these applications.