The Impact of 3D and AR on Consumer Audiences

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Abstract

Informing today is a process that is based not so much on communications as a method of transmitting information, as on the possibilities of using new technogenic forms of communication. This is primarily due to the fact that new ways of communicating with a mass audience, such as augmented and virtual reality, and 3D modeling, make it possible to provide potential consumers with a new experience that can attract attention among the information noise that surrounds the modern audience. This is especially pronounced in the activities of trading companies and brands, whose experience of communicating with the audience, discussed in the article, can become a useful experience for solving issues of working with society with the help of new information technologies. In addition, the article examines the profound impact of digitalization on our world and on individuals individually from the perspective of several established disciplines, and traditional fields of study, including psychology, neurology, psychiatry, sociology, anthropology, culture, and history. In the coming era of digitalization, humanity is changing, there are more and more observations and evidence of the possible emergence of a new form of psychological integrity of an individual.

1. Introduction

Since the beginning of the era of digitalization, humanity, and the whole world have been undergoing changes due to the rapid development of information technology, artificial intelligence, the growth of big data, global telecommunications, and robotics. Digitalization has a progressive and extensive impact on all aspects of everyday life, including information processing, communications, infrastructure, logistics, finance and commerce, industry, economics, education, healthcare, and entertainment. Along with the previously existing physical world, various types of social networks, virtual communities, and realities appear and spread, the world is rapidly filling the digital space for virtual objects and algorithms for the interaction of virtual objects with each other, as well as the interaction of virtual objects with the external real environment. As a reflection of the massive and progressive penetration of digitalization in the world and among individuals, an international study conducted in 2021 revealed 4.66 billion active Internet users and 4.2 billion active social network users worldwide, respectively. Social isolation and quarantine caused by the COVID-19 pandemic have further strengthened and expanded the penetration of digitalization worldwide, the use of Internet services has increased from 40% to 100% since the period preceding the quarantine.

There is already more and more evidence that digital technologies have a significant impact on brain function, mind, and human behavior at a deep neurobiological level. The impact of digitalization on humanity is deeper than it seems. As a result of the extensive, progressive, and deepening influence of the digitalization process on the world and people, developing phenomena and growing evidence point to the possible emergence of a new form of the individual in the era of digitalization, which can be called a digital personality.

In the process of digitalization, there were various, complex ways and levels of interaction between various changes in the world and human changes from the industrial era to the era of digitalization. Changing people adapt, survive and even transform in a changing world in the process of digitalization. At a more fundamental level, in time and space, it will be the direct and indirect interaction of various elements of digital technologies with the changing world and culture, as well as with pre-existing and changing human concepts, behavior, ideologies and identities of individuals. The process of digitalization acts as a mediator of pre-existing changes, and as a causal factor of emerging changes in the world and humanity.

While the whole new digital world is infiltrating our daily lives, mainly through the increasingly dominant digital world, as well as the confusing Internet of things and social networks, fundamental changes are already taking place in our personal and interpersonal spheres. As the development and spread of the metaverse occurs at a rapid pace, in addition to the previously existing physical world, various types of virtual communities are additionally formed, leading to various virtual realities, namely virtual reality, mixed reality, and augmented reality. The development of a continuous environment of digital twins leads to the transition from digital twins, the digital generation to the final coexistence of physical and virtual reality, called surreality. Some researchers have already predicted the evolution to a digital triplet, which is supposed to be a form of intellectual world activity involving an active level of human participation. The progressive and unprecedented formation of various digital media, as well as virtual communities and realities with various inherent systems, rules, values, and cause-and-effect relationships potentially have a profound impact on the actors involved, especially when the boundaries become increasingly blurred and displacement becomes more frequent and intense.

The digital environment in the modern world is an innovative source of the latest ways of distributing information messages in order to promote certain goods and services to the general public while being guided by all the principles of effective presentation, as well as relevant ways to attract the attention of a modern audience. It is possible to achieve such a result due to the commissioning by numerous companies around the world, including in Kazakhstan, of modern marketing methods based on the latest technologies.

2. Research. How brands use technology to work with the audience

The digital environment in the modern world is an innovative source of the latest ways of distributing information messages that can promote certain goods to the general public while being guided by both the principles of effective communication and relevant ways of attracting attention [1]. Based on a large number of cases where the use of three-dimensional models and augmented reality has led to various increases in useful indicators, we can say that the introduction of new technologies contributes to brands gaining more prestige, as well as the development of companies in their activities. One of the examples of how well the introduction of such "chips" influenced him is the famous world brand of women's fashion Rebecca Minkoff. This company has been working with 3D and AR since 2019, which led them to obtain the following positive indicators: those users from the website who used three-dimensional models were 44 per cent more likely to add this product to their cart, those who used the brand's 3D chip were 27 per cent more likely to leave an order, however among them, the direction of augmented reality stood out since those who used it were 65 per cent more likely to buy the product. Thus, for example, the company's clients can see in advance what size a handbag will be and whether the colour of the product matches their interests.

The latest technologies help brands not only in showing their products interactively, as well as customers in viewing the product before buying it, but can also show them to potential investors before they pour money into this brand [2].

In general, if we pay attention to the use of augmented reality in advertising, we can conclude about the numerous options that it offers. The industry achieves this effect primarily due to the high utility of AR for doing business. This conclusion is also confirmed by Forbes statistics,

according to which advertising in augmented reality offers an emotional experience 70% more memorable for buyers than the usual methods of promotion. And 78% of people after watching AR advertising now prefer it to, for example, video.

Another example of how the famous company keeps up with the times is the streaming service Netflix and one of its most popular series "Very Strange Things". It is known that the TV show gained significant success already by the release of the second season in 2017 and the popular streaming simply could not help but accompany it with competent marketing in augmented reality. So, as part of a marketing company in Snapchat, with the help of SnapChat Lens, fans could record videos with themselves in the locations of their favourite series. And although the company itself does not publish data on its Nielsen and AdWeek audience base, it became known that the second season of the project became the most popular series of the service this year.

Nevertheless, we want to highlight ways to use AR competently in marketing. So, with the help of this technology, you can make an interactive display of the product. In a similar way, in 2019, Toyota used the automobile company, which released Hybrid AR, an application through which users were shown the key features of the automobile and how it uses energy. This was done by superimposing virtual images on a real automobile, in addition, internal mechanics and transmission were shown to customers, which made it possible to convey information about the uniqueness of the product.

But moving away from the topic of big things, you need to remember about other goods, as they are purchased much more often. So, to increase the brand value, you can create a fitting experience for customers. This approach was used by the optical company Warby Parker engaged in online sales. They released an app that helped shoppers try on eyeglass frames by it directly using AR technology. After all, before the introduction of the application, there was a problem of added price, as costs increased due to the shipment of goods and their returns. And judging by the fact that in the year of release of this software, the number of its downloads doubled monthly, and this contributed to the development of the brand, since in 2020 the company's value reached three billion dollars thanks to this, besides, the company collected 245 million additional investments, it is possible to judge how successful the introduction of this novelty was for them.

Virtual reality particles can be present in any content where three-dimensional modelling is used, as we could see from the examples of augmented reality or simply added 3D elements to the framework of real advertising with real people. Nevertheless, it will be important to note the third less popular, but therefore no less interesting direction, advertising using virtual reality glasses (VR). It is known that VR technology is far from new for an ordinary person in terms of awareness about it since many people have somehow heard, and maybe even seen live or on video, how someone used such helmets.

In addition, there are enough VR glasses models from various companies on the market now, among which Oculus Rift and Oculus Quest, whose developers have long joined Facebook, Playstation VR and Playstation VR 2 from Sony, aimed more at the gaming component of the industry and HTC Vive, offering similar functions. Just working with the latter was chosen by the aviation company Textron Aviation to show its aircraft to potential customers. By itself, the technology of virtual reality glasses is far from the most affordable device for the average user, let alone its own aircraft, nevertheless, it allowed this company not to reach a new level of costs. The fact is that Textron Aviation cannot send every customer on a flight to make a purchase decision to display its aircraft. Of course, this would be the best experience for him and would allow him to form his own opinion, but it is very expensive. The buyer can go into a real plane, see how everything looks from the inside, and touch the materials, but it will not be possible to experience the sensations of a real flight. To solve this problem, the company decided to purchase virtual reality glasses to show many important aspects that complement the viewing of real aircraft. Firstly, customers will be able to visit the virtual cabin of the aircraft and see for themselves what it's like to fly in it. Secondly, it will be possible to change the colour palette using special remotes and, accordingly, select the necessary one. It will be important to compare the noise inside the cabin, as users will be able to listen to the sound inside this model, as well as the company's competitors directly during viewing and make sure of the important selling component of the new aircraft, namely low noise. This solution allowed the brand to solve the

problem cost-effectively and efficiently, since in addition to the relative cheapness, it also made it easier to work with four to five mobile groups that prepare stands every week and can travel around the country due to the ease of equipment. In addition, an important aspect of the direction of the choice in the direction of HTC Vive was the high quality of the video image.

An interesting way to increase profits for brands may be the introduction of QR codes on their products. This approach is used by various companies, among which it is worth mentioning the Rollie Nation shoe brand located in Australia, which began to print special codes on its products, where it was possible to find out information about shoes with their help. In the end, this contributed to a much faster decision about making purchases. Of course, large enterprises will not miss such an opportunity, as Amazon did with its Halloween promotion. The fact is that a special pumpkin was applied to the thematic boxes, after scanning which buyers could apply it as filters on their faces and share it on social networks.

AR's ability to create a memorable experience for users is one of the strongest advantages. According to The Drum Report, activities using augmented reality can hold a person's attention for more than 85 seconds, which is extremely important considering that people's focus has decreased to the level of a golden fish, and therefore we can say about the value of their application.

Such experience is being implemented everywhere in the sports field, which is clearly shown by the example of the NFL club, the Dallas Cowboys, one of the most popular teams in American football.

At the home opening match of the season at the stadium, the club, together with AT&T, Samsung and Nexus Studios, launched an augmented reality experience, thanks to which fans could watch with their smartphones, players and mascots of the team interacting with different objects in the stadium. Nevertheless, such an action did not end with this entertainment alone, since during the big break of the match, fans could play a special animated game that worked when pointing their phones at the field. In addition, kiosks aimed at creating virtual "selfies" were erected around the stadium, allowing fans to take pictures with their favourite players while posting them on social networks. Such an event contributed to the appearance on social media of more than fifty million impressions of the overall experience, which may indicate the success and popularity of the actions taken.

Speaking about attracting attention, we have already noted that augmented reality increases the time that users spend interacting with advertising. This fact is also confirmed by information from Reydar, where it was reported that the advertising from the Engineering Design Show received 16 per cent coverage of their campaign with interactive robots, while the average viewing time of the ad reached as much as two minutes and twenty-nine seconds [3].

A similar success story awaited the popular fast food chain Burger King, due to the fact that the fast food brand launched a special promotion in Brazil, in which everyone who downloaded the famous company's application could get a free "Whopper", a branded and standard burger of this restaurant chain. All that needed to be done for this was to simply point the camera at the advertising signs of competitors, which provoked the application to virtual burning of the banner, since with the help of a special AR "chip", it was literally covered with superimposed fire, followed by the appearance of the Burger King inscription, which read – "grilled always better", and you can get your free "Whopper".

Thus, Burger King was able to get huge marketing support for itself, since according to the data on the results obtained, over half a million people "burned" advertisements of competitors of the restaurant chain (by the way, a voucher for a free burger was issued one per person) and received a free prize. At the same time, the value of the company itself increased in the market, and the application broke through to the first place in the ranking of the most downloaded in the AppStore, which in itself affected another indicator, namely, an increase in in-app sales by 54.6%. However, advertising using AR technologies has been used before, for example, in 2014 in London, Pepsi Max turned the wall of a local bus stop into a window where people could watch flying saucers, attacking robots and tigers running down the street. This use of augmented reality technologies made this campaign one of the most creative approaches in AR advertising that year [4].

Such technologies can be used not only in this way. B2B marketing, that is, between businesses, can be a costly business in which you often have to use printed materials. To make it more fresh in terms of novelty and virality, in 2016, thINK launched an application specifically for the conference, with which users could scan postcards and receive information in AR format. This event brought a gaming component, as the participants also competed for the main prize [5].

In 2012, using new technologies, the Chinese online store Yihaodian found an interesting solution to compete with large chains. Due to the fact that the main activity of the company was on the Internet, they decided to open 1,000 of their stores all over Beijing at once, but they did not have to build buildings for this. It turned out that the brand's new stores will be completely virtual and visitors will only need to point their phones at the location of a computer-modeled store in order to see virtual shelves with products and purchase them. After making purchases, they will be delivered directly to customers' homes. This solution made it possible to bring comfort to shopping, as it saved people from having to wait in queues, while not depriving them of the opportunity to participate in the real buying process. Various locations were selected for placement, among which squares can be noted, as well as territories located next to office buildings [6].

2.1 AR, 3D and artificial intelligence as an aspect of the communicative space

AR is a technology that has found application not only in the field of marketing but has also determined its place in many other branches of human activity. So, Google, known for its great contribution to the development of augmented reality, it is enough to recall the famous Google Glasses, has released an interesting feature for another very popular product of its own – Translator. The function that allows you to translate any written text into different languages of the world has also distinguished itself with another useful feature. The fact is that if you use a special option to take a picture of the inscription in a foreign language, the translator will display it in a suitable variant for you. It is noteworthy that if you have a WiFi connection, you will be able to receive the transfer immediately. However, if there is no Internet access nearby, you can always download the necessary languages in advance and the translator will work offline, which is a great convenience. Access to this software is available for both Android and iOS.

Amikasa also has a similar function as applications from IKEA or Leroy Merlin – special software that allows you to place 3D models of furniture elements in different rooms of your apartment. It is also important to note the possibility of using furniture sets belonging to completely different companies, and you can also buy them directly using the furniture application. But Wanna Kicks allows you to see how the shoes will look before their official purchase, which makes it similar in functionality to the same software from Nike. There is also an option similar to Nike By You to share your photos online with friends, unless of course, you need an additional opinion before buying. Returning to the topic of Google, it is necessary to say that the Google Lens application has replaced their famous glasses. It is software, when you hover it over any object, if it is successfully recognized by the application, you will receive a detailed description and where you can buy it. In addition, you can simply make regular queries in the search engine, save phone numbers and find out where nearby you can find attractions.

An augmented reality application called Roar, similar in functionality, was created to help with tips when buying certain things. Thus, thanks to him, it was possible to learn a lot of information, just enough to take photos, among which there may be food and drinks. In addition to ingredients and prices, it was possible to find out customer reviews and promotions. It also included the possibility of buying movie tickets through posters, which were just enough to scan. And new updates should bring additional features [7].

Among the recent innovations in the 3D modelling industry, the introduction of artificial intelligence into the production process of three-dimensional graphics has appeared. And although it is not possible to directly create ready-made images using AI at the moment, many specialists or novice designers began to worry that artificial intelligence could take their work away from them in the future. To the greatest extent at the present time, this has affected 2D

artists and designers, since ready-made images are quietly generated by many neural networks, which takes much less time to produce than the work of a real person. Nevertheless, artificial intelligence has been developing for a long time and such a way of creating images is far from new, except that recently it has achieved significant improvements in quality, which made it possible to obtain acceptable images and use them for publication. And although many artists were really concerned about this fact, others on the contrary took it for granted, since it is quite difficult to stop such a process and a good solution would be to learn how to use it.

It is this opinion that the supporters of the technological novelty rely on, since in fact AI perfectly helps specialists in creating a faster and better workflow. After all, artificial intelligence can create images that are very creative in their content, and an artist or designer will only need to make changes, due to the fact that at the moment neural networks still have their disadvantages.

Firstly, the final pictures obtained with the help of generation still need to be refined, since they may be far from the final representation.

Secondly, neural networks have difficulties producing identical images from different angles, and therefore a specialist will have to refine this difficulty.

A similar conclusion can be drawn for 3D modellers who can use neural networks, for example, to obtain concepts for their work and use these references for further modelling. This can be done by networks such as MidJourney generating images. It is noteworthy that artists began to express their indignation at this, for example, on the ArtStation platform, posting pictures with appropriate protest slogans [8].

An important precedent is the fact that in order to train these neural networks, developers need to pass through them huge amounts of data compiled from the works of artists, which causes disputes over copyright. It turns out that these programs are trained on the basis of the works of other authors without any compensation. A similar path is followed by the Point-E machine learning system, which also uses millions of three-dimensional models for its training, which in many cases allows summing up the task assigned to the program at the very beginning of work. According to research opinions, the functions of this software can already allow the use of point clouds created by Point-E, printing various products using a 3D printer, besides being used in the process of creating animations and games.

However, Point-E is only a way to create points of a certain shape using clouds, without taking into account the details, which led the creators of the software to the need to train another AI to transform points into grids, that is, sets of edges, faces and vertices defining the object.

In total, the system created by developers from Open AI is divided into two parts, the first is a variant of converting text prompts into an image. This part of the functioning of Point-E does not differ from other neural networks generating images in the likeness of DALL-E 2 and Stable Diffusion. The system was trained on special labels left on the images to create an understanding of the connection of the visual with the text. But in the conversion of images into a three-dimensional view, the connection of labels in pictures with objects having volume has already been used. A similar system generating a 3D system called Dream Fields was introduced by Google in 2021. However, next year, along with the launch of the extension for the previous version, Dream Fusion saw the light, software capable of reproducing text in the form of three-dimensional representations of objects, but with one important feature, the system no longer needed data to study and can produce ready-made versions without any database [9].

However, while AI is gaining more and more opportunities in terms of 3D modelling, at the moment it will still be difficult for him to bypass modern professionals since only they can bring any idea of designers to a ready-made production look. The process of creating a 3D photo, although it may seem quite complicated at first glance, is actually simple. First, you will need to create a 3D design file, for example, if you need to create such a layout for a smart speaker. 2D photo sources may be involved, but not always. So, CAD templates or simple scanning without direct use of the camera may be enough. Thus, the result of these actions will be a raw three-dimensional model, which will be the basis for the final product. Then these prototypes will be transferred to modelling programs, where they will be subject to rendering, thanks to which

designers will be able to get the final frames, which tend to be in various decorations and have numerous ready-made angles that can be changed according to the need of the client.

This approach shows significant advantages of 3D photography in relation to conventional images since it not only reduces the time spent on completing the entire shooting process but also makes the entire working sequence profitable by reducing the cost. To begin with, let's pay attention to the speed since it usually takes a lot of time for the team to organize the shooting process. You will have to rent and prepare an equipped photo studio, you need to put lighting, and tripods with cameras. In addition, you will have to pay professional photographers, which in itself can be very expensive and this is not taking into account additional specialists like inventory managers or graphic designers, whose help may be needed for the successful and smooth operation of the project. And here we should not forget about the time required to complete the process, from creating photos to posting them on the website, all this can increase the time to finish the work to weeks, or even months. Summing up all this, it is believed that the price for only one photo can reach from 100 to 400 dollars.

Nevertheless, all these points are offset by the presence of 3D modellers working both in your company and outside it as freelancers on outsourcing. Such a team of specialists, although it still consists of some necessary number of professionals, still has fewer of them in its composition than with a traditional photo shoot. At the same time, they may not even need cameras, since the software and the design of the product files will be enough. In terms of time, you can also count on a reduction, since a number of photos can be ready within one day. All these actions contribute to lowering the price for the photo, as it was calculated that the cost for one piece will be ten times less than with normal shooting.

It is also worth considering the fact that you can always make additional changes in 3D photos, which makes this method much more attractive. Someone may argue, based on the quality of the work performed, that it may be inferior to the usual photos, but with the modern capacities of graphic programs, this is not so important, since the functionality and the presence of editing indicate clear advantages. It is noteworthy that 75 per cent of the IKEA catalogue consists of 3D rendering [10].

3. Conclusion

The fundamental elements of a person's self-consciousness under the influence of constant immersion in virtual reality in a digital environment will gradually be "digitized", including our consciousness, sense of reality, sense of individuality, experience and self-perception. Our sense of experience, sense of boundaries, sense of continuity and accumulated memories will also shift and alternately differentiate between our online status and offline status.

Artificial intelligence should be a tool for increasing intelligence, where human values, freedom of action and freedom of choice will be priorities. Since digitalization is a continuous global process in time and space, it will take time to see its potentially imperceptible impact on people in the process of digitalization. In particular, it can be expected that the impact of digitalization on young people, up to the levels of self, mind and brain, will be more inevitable and profound, given its more primary, dominant and direct impact on them as digital derivatives. To explore such a complex, subtle, new and deep research topic, several disciplines and traditional fields of study should be used. The study of the "digitized archetype" should focus on fixing, differentiating and analysing changes in the profiles of self-consciousness of the individual over time with probable subsequent prevention and intervention in order to mitigate any adverse consequences for the psyche and consciousness of the individual.

Different types of research developments and research methodologies can vary from qualitative research to quantitative research, from cross-sectional research to long-term research, as well as from target groups and field research to population-scale research. Further analysis may focus on groups of different ages and varying degrees of digitalization. It is also necessary to monitor any changes between generations and any cultural differences in the original archetype in the process of digitization in time and space, paying special attention to any

changes in fundamental human nature and universal humanistic qualities for further necessary philosophical and ethical analysis. Subsequently, a joint program of various stakeholders, including citizens, multidisciplinary specialists and experts, scientists and researchers, information technology experts and entrepreneurs, as well as policymakers, would be a way to solve this unique and global problem related to human existence.

3D modelling has a high ability to attract attention, this is achieved by the effects of novelty and increased interaction with the audience. Against the backdrop of increased information noise, such advertising allows companies to stand out. Due to this, relationships with the audience are established, and the image becomes better. Another indication of the importance of using 3D modelling in advertising is the fact that the attention span of modern people is decreasing, and 3D advertising makes it possible to retain it.

In the case of augmented reality, one of the important components of its success, in addition to the high level of immersion, can also be considered its accessibility, since content using AR can be viewed on any modern gadget, which is supported by statistics of the expected figure of 1.7 billion people using augmented reality already in 2023.

The works of 3D modellers are of high quality, sufficient to cover the promotion of goods for the most part, this is evidenced by the fact that 75 per cent of the IKEA catalogue consists of 3D rendering. If we take into account only the 3D rendering market, then according to data for 2022, its cost has reached $ 3 billion, while for the period from 2022 to 2032, this figure will increase to 35 billion, which is due to an average annual increase of 20 per cent. This effect is facilitated by the adaptation of technology in the real estate and commodity services industries and is supported by attracting attention due to the possibility of tuning the results obtained. Therefore, this direction is considered highly promising and requires further consideration in scientific and practical environments. In particular, it will be important to mention the importance of considering the introduction of additional training specialities aimed at training specialists in the 3D modelling environment, including those capable of working in the fields of marketing and advertising. Since 3D technologies can be combined in their work with another novelty of the modern world, artificial intelligence, the Point-E program became an example of the interaction of the two industries with each other, and this was also shown by the case of IKEA, which used AI to create 3D designs of its furniture based on catalogues of previous years. At the moment, the total market for the use of AI in the world reaches $ 327 billion, and the planning of AI in marketing reaches an indicator of 15.84 billion with a forecast to grow to 108.7 billion by 2028.

All these cases provide a wealth of experience, which in turn allows us to consider new technologies as a way to influence public opinion and decision-making in the communicative component of working with society.

4. Acknowledgements

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