COVID-19 PANDEMIC: THE OBSTRUCTIONS AND DRAWBACKS FROM THE GROWTH IN INTERACTIVE TECHNOLOGIES

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ABSTRACT

Pandemic COVID 19 outbreak leads to the development of physical distancing between humans.The repeated lockdown restrictions disrupted conventional social life activities. Partially closing of workplaces, educational institutions, recreational activities, and encouraging people to work from home has resulted in a surge in the use of interactive technology, which has largely supplanted normal lifestyle.The impacts of interactive technologies during the COVID 19 pandemic are discussed in this descriptive review. Furthermore, this paper aims to comprehend the problems that arise as a result of the sudden increase in the use of technology. The study's findings identify the possible challenges and disadvantages of various interactive technologies.The trend of different types of interactive content opens up the possibility of using hyperrealism in interactive technology to enhance immersion and elicit emotional responses.

Keywords: Interactivity; Technology;Gaming; Immersion; Virtual Reality

1.INTRODUCTION

COVID-19's impacts are having a major influence on our day-to-day life. Though this is a worldwide pandemic, it has affected every country on the planet. Sectors such as education, health, economy, society, culture, tourism, etc. had an extensive effect. Nearly after 1 year and 8 months the pandemic is prolonging and most of us are still in partial lockdown. Due to this situation, many organizations have switched to work from home. Thus, this pandemic has pushed us from a conventional approach of work to a remote and online approach. However, this sudden growth in the use of technology caused several challenges. The adoption of interactive technologyto work from home was not robust

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enough to cope with the COVID-19 impact. The importance of interactive technology pre-pandemic was not so apparent. However, interactive technologies has been an integral part in digital technologies that has existed on several platforms for online shopping, watching films, texting and voice calling. But during the COVID-19 pandemic, the importance and use of interactive technology in our daily lives have increased exponentially. The acceleration in the digital transformations is likely to continue and could leave a long-term impact in reshaping the future of our society.

When considering the impact of interactive technologies at COVID-19, it's important to think comprehensively. A technology trend could be seen in how society is accepting it to emerge out from the pandemic. Some of the technology which emerged in the forefront are Contact Tracing, Blockchain, Artificial intelligence (AI), Interactive Gaming, Robotics and Drones, Extended Reality such as Virtual Reality (VR) and Augmented Reality (AR). A positive approach was applied to counter the socio-economic challenges caused by the pandemic with use of the these technologies. AI helped in understanding and analyze the trends in the economy, COVID-19 infection rates. In many cases for immediate assistance AI chatbots were used to solve people's queries during COVID-19. Robotics were used to minimize human involvement and drone technology to monitor the population in maximum risk areas. To control the spread of the COVID-19 virus transmission the technology of contact tracing was the key component. Communication technologies such as Zoom, Microsoft Teams and Webex experienced a very high demand as people were working remotely and meetings were conducted online. The use of gaming and extended reality technology such as VR and AR grew tremendously. With the COVID-19 restrictions of touching and social distancing,many chose to use immersive VR experience for leisure, VR tourism and online shopping. Parallelly AR technology helped in visualizing new haircuts, clothes and trying new cosmetics. The COVID-19 pandemic has enforced the technological impact on our daily lives. The new normal of more frequent interaction with the technology has a versatile influence on the acceptance and use of technology.

2. BACKGROUND

2.1. *Interactive and Digital Technology*

In human history like all serious disruptions, the COVID-19 pandemic caused unprecedented health and economic crisis. The majority of the people had to make their home as an office and adapt to work remotely. This led to a drastic increase in the influence of digital technologies during the COVID-19 pandemic lockdown. Based on the recent studies it has been perceived that the most common reaction among the people during this pandemic is the fear of not accustomingto the digital technologies. In the Health Anxiety Inventory (HAI), fear scores the highest scale during the pandemic (Nicomedes & Avila, 2020). The situation of digital transition in different industries has affected society as a whole(Golinelli et al., 2020). The role of digital technologies to mitigate lifestyle and solve challenges has become predominant. As the COVID-19 pandemic has resulted in the rapid adoption of digital solutions with sophisticated technological tools. Hence an empirical link between the digital technologiesadoption and

pandemic can be seen. In this case, the role of interactive technology is enormous. According to Dick & Burrill (2016), interactive technology basedinformation flows in two-ways through an graphical interface between the user and the technology; the user typically communicates a request for data or action to the technology, with the technology returning the requested data or action result to the user.The term "interactivity" refers to interaction, cooperation, or any sort of exchange between two or more actors, which allows for at least two possible interpretations: either as an interaction between a human and a machine from a technological point of view; or as a communication exchange between individuals from a pedagogical point of view (Severin & Tankard, 2001). The term interactivity could be used without referring to technology. However, in everyday life, the use of this terminology is commonly seen in situations where people communicate with or through technological tools (Gudmundsdóttir et al., 2014). Hence, interactivity can be understood as two things working together to influence each other to exchange information.

Both the digital technologies and interactive technology are interlinked to each other. interactive technology is anvital part of digital technologies as it helps to immerse the user. To comprehend the concept and significance of interactive technology it is interesting to understanddigital technologies. In this digital age, the digital technologieshas become a crucial part of our routine life. Television, smartphones, laptops and smartwatches are just some of the digital technologies that are often used for performing diverse tasks. The use of advanced digital technologies has strengthened productivity in various sectors around the world. Globalization also helped in improving technology adoption through the transfer of foreign knowledge, enhancing international competition(Damian & Manea, 2018).The evolution of digital technologies has an extensive influence on society. Which can be perceived by the growth in the number of new users. The latest trends indicate that 4.5 billion people use the internet and 3.8 billion on social media which means that 60% of the world's population are consumers of digital technologies (Kemp, 2020). Furthermore, the consumers of digital technology interactions can be categorized between linear and non-linear multimedia. In linear multimedia,there are nonavigational capabilities. It has a definite start and finishes. It follows a logical path from the beginning to the end. The information in a linear structure is given in chronological sequence.Non-linear multimedia, on the other hand, does not adhere to this one-way pattern and instead enables users to freely navigate around all elements of the multimedia in any sequence. This allows customizingthe interaction experiences based on choices and requirements (Taylor D, 2019).

Hence, it can be summarised that the blend of interactive technology and digital technology together formed interactive digital technology.Since the start of COVID-19, the use of interactive digital technology has been very extensive in our lives.Lockdown situations around the many countries restricted outdoor activities due to which the communication, leisure and educational type activities became more coherent with the intensive use of interactive digital technology. Though, since the 1990sinteractive digital technologies has developed knowledge management platforms, mobile applications,

digital games, immersive virtual reality (VR) experiences, interactive videos,interactive art, cinema and social media(Spacey, 2017). The extensive use of it was seen in the education sector.

2.2.   *Interactive Digital Technologyin Educational Context*

In the COVID-19 the use of interactive digital technologies has increased for educational purposes. Millions of students have suffered from the closure of educational institutions. But due to online classes and travel restrictions, "massive online open courses" (MOOCs) gained popularity and attracted a large number of students from different countries around the world (Eichhorn & Matkin, 2016). However, it lacked in providing comprehensive educational support.In most parts of the globe, mobility is under control and it makesdifficult for educational institutions to continue offering face-to-face courses in which students may interactwith one another (Donthu & Gustafsson, 2020).In the COVID-19 pandemic, digital technology is a major medium of instruction for both institutions and students (Mustapha et al., 2021).To continue theeducational programs, institutions rely heavily on the development of the Internet and digital network technologies. Countries with a strong internet infrastructure and gadgets were better able to react and function from a distance during the pandemic breakout (Wodon, 2020).Although digital education has become increasingly comprehensive in terms of accessibility and outreach for teaching and learning, cost and time savings, flexibility in location, travel savings, making education more inclusive. But it is only when the Covid-19 pandemic struck the world that digital education was fully implemented. Through various digital platforms, students moved from the face-to-face to asynchronous or synchronous online mode of education by using different types of tools in support of the learning(Iivari et al., 2020).Another advantage of digital technology can be seen in completing the education with the graduation of the final year students (Mustapha et al., 2021). In the context of travel limitations,interactive digital technologies has opened up new global platforms for exchanging and sharing knowledge through virtual international conferences. This created the space for educators and students to interact and share information without the need for travel(Dharmarajan et al., 2020).Constructive and sustainable community development has continued to enhance the learning experiences (Iyengar, 2020). The COVID-19 pandemic has shown that the need for people adapts to new environments. Parents enhanced their digital competencies to support their children atthe home for doing homework by taking the role of a passive teacher(Dwivedi et al.,2020; Oberländer et al., 2020). However for comprehensive sustainable developmentof digital technologiesis still a challenge for communities without the accessibilityof the internet facility(Abideen et al., 2020). The digital technologieshas innovated drastically during the COVID-19 but has helped in controllingand forecasting future events only where it has the reach.

2.3.   *Digital Innovation (DI) of Technology*

During the pandemic,the DI platform offered information transition, teaching and learning and knowledge sharing in the community by the use of digital education(Khan & Qureshi, 2020). Emergent technology such as AI and VR are the essential components for a transformative change in the future.Digital innovations in different sectors have implied the adaptiveness of new technologies with a sustainable approach. Hence, DI is significantly correlated with sustainable development(Tønnessen et al., 2021).

Adoption studies haverevealed that the adoption process is not simple, as it may affect a variety of factors such as learning technology, context, and approach.Fear appears to be having an impact on the adoption of technology during the COVID-19 pandemic when most organizations have begun to implementdifferent technologies (Al-Maroof et al., 2020).Another kind of fear in severalsectorsis from lack of preparedness and technical readiness, both of which have a detrimental impact on technology adoption (Mac Callum et al., 2014; Thatcher & Perrewe, 2002). The majority of users haveoffered various reasons for their aversion to using technology. Some of them have acknowledged that it is a question of self-assurance. When a person works, he is bound to make mistakes, which heightens the anxiety element. One of the most important assumptions in the current study is that the fear factor that arises as a result of the transmission of COVID-19.Thus, incremental advancement in DI with keeping the need of the people could help in reducing the fear touse the technology and increase acceptance.

3. METHODS

3.1. Research Questions and Literature Search Process

This descriptive researchreview is aimed to address two research questions; How influential is interactive technology during the COVID-19 pandemic? What problems arise and challenges faced during the sudden increase in the use of technology?. The initial search to review the literature was implementedfrom Feb 10 2021 to 15 April 2021 and later extended to 15 June 2021. The search for the scientific literature was conducted in databases such as GoogleScholar, Web of Science, Scopus to include quantitative and qualitative studies related to answer the research questions. The search query consists of the terms "COVID-19", "Influence of Digital Technology", "Interactive technology","Trends in Technology" and "Technology acceptance problems". Based on the search a multi-level screening from the title and abstract of the articles were conducted. Those articles which did meet the criteria in the context of the research questions were included. To identify useful literature the search was kept in relevance to digital technology uses in sectors such as education, healthcare, business, and other areas. By the end of May 2021, the number of articles found was 104.However only selected and relevant researches were investigated based on newest and compelling information about the developments in interactive technologies.

Figure 1. Literature search process
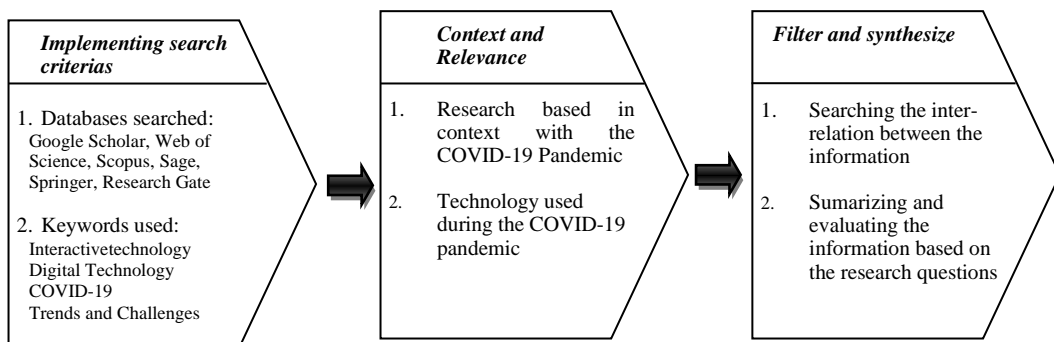
The literature search process was done in three major stages as shown in Figure 1. Different boolean operators such as OR, AND, NOT were used to identify articles related to the research and combine different variables. The keep the reliability of the research coherent, peer-reviewed latest researches were evaluated. Furthermore a literature review matrix was prepared in order to identify pertinent informations in broad categories related to specific contentas shown in Table 1. Findings based on the literature metrics has been compared and evaluated to synthesize the information and identify the differences.

Table1. Summary of literature review matrix

Category	Studies
COVID-19 pandemic, current crisis, pandemic scenario	Donthu, N., & Gustafsson, A. (2020); Abideen, A. Z., Mohamad, F. B., & Hassan, M. R. (2020); Donthu, N., & Gustafsson, A. (2020).
Technology adoption, Social media, Digital technologies, Gaming	Al-Maroof, R. S., Salloum, S. A., Hassanien, A. E., & Shaalan, K. (2020); Budd, J., Miller, B. S., Manning, E. M., Lampos, V., Zhuang, M., Edelstein, M., Rees, G., Emery, V. C., Stevens, M. M., Keegan, N., Short, M. J., Pillay, D., Manley, E., Cox, I. J., Heymann, D., Johnson, A. M., & McKendry, R. A. (2020); Cabarcos, M. Á., Soriano, D. R., & Chousa, J. (2020)
Emergent technologies, Artificial intelligence	Eichhorn, S., & Matkin, G. W. (2016); Damian, D., & Manea, C. (2018); Dwivedi, Y., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N., Sharma, S., & Upadhyay, N. (2020).

| Education variations, Digital trends	Iyengar, R. (2020); Kemp, S. (2020); Mustapha, I., Thuy Van, N., Shahverdi, M., Qureshi, M. I., & Khan, N. (2021).
Interactive technology, Digital technology	Taylor D, P . (2019); Spacey, J. (2017); Tuma, F. (2021) ; Vargo, D., Zhu, L., Benwell, B., & Yan, Z. (2021); Whitelaw, S., Mamas, M. A., Topol, E., & van Spall, H. G. C. (2020)
Technology anxiety, ICT	Thatcher, J. B., & Perrewe, L. P. (2002); Tønnessen, Ø., Dhir, A., & Flåten, B.-T. (2021); Mac Callum, K., Jeffrey, L., & Kinshuk. (2014)

4. EMPIRICAL ANALYSIS

4.1. *Relationship of Technology and COVID-19*

Technology plays an important role in the storing, sharing and transferring of information in audio-visual medium(Tuma, 2021). Emergent technologies such as AI and Big Data helped to systematically analyze and extract complex information in the tracking of people and control the spreading of the COVID-19 virus. Digital tools like real-time tracking apps, migration and mobility maps also benefit in locating people's movement during lockdown(Whitelaw et al., 2020). However, tools such as body temperature sensors, security cameras for video surveillance, bank card use records and facial recognition tools were aggressively used for contact tracing. Furthermore, 24/7self-monitoring smartwatch technology to observe the sleep patterns, pulse rate, calories burn and temperature is extensively preferred. In Figure 2. different technologies which harnessed the strategies to control the COVID-19 are shown.

Figure 2. Technologies used in COVID-19
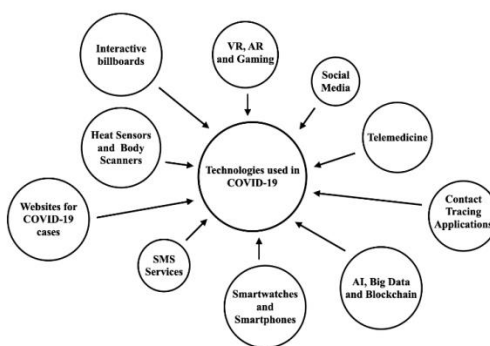
These technological interventions with active community participation have majorly supported to control of the spread of false information about COVID-19. However, it was not the same for people from low-income countries with weaker health care systems. The use of digital technologies in these countries was very limited and it affected awareness hence the community transmission was high(Budd et al., 2020). The technology invasion constitutes threats to the mental and physical well-being to make life complex for individuals who are not found of it. It could lead to restriction the access to information. This could be seen in the case of the elderly people who are not used to technology for everyday use.

Both positive and negative effects of the digital technology are visible in the sphere from social media engagements, businesses, lifestyle, healthcare, education and human behavior. In the case of education recorded classes could be seen again if any student misses. It created a comprehensive learning environment. Innovative approaches were used for facilitating the approach of technology in people's lives during COVID-19.The impact of technology on the healthcare system is substantial. During the pandemic, medical professionals and all types of patients with various chronic conditions are without any doubt the greatest group of consumers of digital technology (Vargo et al., 2021). In many places, real-time monitoring apps to check the health status and temperature control were used for people entering premises ofthe schools, colleges, universities, entertainment places and offices.The economy and businesses were also impacted. Videoconferencing technology was used.This allows presenters to assess their participants' attentiveness in real-time, record their voice, conversations, and faces, as well as their home environment (Papadopoulos et al., 2020). However there were privacy concerns as many user's were uncomfortable of their conversations being recorded. The sharp rise intechnological developments were seen in the gaming and eSports industry. Gaming and eSports do not appear to be a fleeting fad, and the sector has flourished during the COVID-19 pandemic (Cabarcos et al., 2020). Digital games are perceived as relief for families during the lockdown restrictions. However, the addictive nature of gaming impacted socializing and coping with stress. It is necessary to find a balance between the games that satisfy the need and simultaneously provide knowledge and awareness (Willy C. Kriz, 2020). Thesedigital technologiesplayed an important role in overpowering the effects of COVID-19.

5.CONCLUSION

From the assessment of the selected articles, our review suggeststhat the influence of interactive technologyappeared to be very impactful during the COVID-19 pandemic. By the high degree of innovation on both digital and interactive technologies,several potential effects are seen on the education, healthcare, economic, tourism, manufacturing, aviation, tradeand service sectorswith a significant difference from high-income countries to low-income countries due to the labor shortage disruptionsin pandemic. For the effective global implementation of interactive technology, one of the minimal requirements is high-speed broadband. The regions and users which suffered problems with interactive technology were lacking in technological infrastructure. With

subsidized internet plans, free Wi-Fi hotspots and digital training provided could narrow the disparities.But the hardware and software technology saw growth inprice during the COVID-19 pandemic. However, the technological deficiency was greatly improved across several sectors. Due to these improvements in interactive technology, unprecedented changes were seen in society. Nevertheless, the impact and uncontrolled penetration of digital technology is still a global matter of concern. Privacy and data security concerns were the potential offsets faced during the COVID-19 pandemic.

At present fewer scientific contributions addresses the influence of interactive digital technologies on people's lifestyle during the COVID-19 pandemic. As the pandemic continues more digital technologies are going to engage the lifestyle of people. AI, big data analysis, real-time tracing, telemedicine and many online internet-based technologies are some of them.Furthermore, hyperrealism combined with interaction may open up new immersion possibilities in the future. The seamless integration of hyper-realistic graphical visualization with interactive digital technologiesmight increase the consumers' emotional reactions in the digital era. As a result, futuristic interaction visualizations might utilize the technology of likeness and hyperrealism to try to find new ways to restrict the sensation of uncanniness.

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