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Mini Review

The Metaverse and Digital Therapeutics

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Abstract

The Metaverse is the subject of much interest, speculation, publicity, and investment. The fact that a global giant such as Facebook has changed its brand identity to "Meta" speaks volumes about how the Metaverse is seen as a massive opportunity for many different types of applications, primarily seeking to develop the Metaverse as an engaging and profitable virtual environment where people can interact, socialize, do business and be entertained. It seems to be true that there has never been a better and more appropriate time in human history for a potential solution to the most pressing global challenges humanity has ever faced, such as pandemics (which limit human to human contact) and climate change (restricting the cost of travel). This article looks at the development of Metaverse technologies over the last 20 years up to the present time and explores the use of the Metaverse as a platform for digital therapeutics.

Keywords: Metaverse; Digital Therapeutics; Workrooms

Introduction and Background

For many people, the Metaverse is a new concept that involves the use of virtual reality or augmented reality headsets to access virtual world applications which are either completely or partially synthetic (computer-generated). The reality is that although the term Metaverse originated from a novel written in 1992, the first practical, functional and widely accessible Metaverse came into existence as long ago as 2003 when the virtual world "Second Life" [1,2] illustrated in figure 1. was launched by Linden Labs.

Figure 1: Second Life Example Metaverse applications circa 2007-2010.

Although Second Life is a proprietary technology platform that requires software to be downloaded and installed on a desktop Windows or Mac computer. It is still arguably the most developed Metaverse in existence with considerably more functionality than many other virtual reality applications on Facebook's "Horizon" platform.

Many developers of current Metaverse applications will argue that, because Second Life does not use virtual reality headsets nor does it use Web 3.0 technology to be accessed on computers and smartphones, it is not the full Metaverse. The argument against that is that, in terms of delivering a realistic, immersive 3D environment in which users can meet, trade, learn and interface with the real world, Second Life is a far more advanced "alternate reality" than even Facebook Horizon.

Web 3.0 metaverse

Web 3.0 can be thought of like a 3D immersive internet that users can navigate on computers, tablets, smartphones, and virtual reality headsets. It is a technology platform accessed over the

internet and does not require the user to download proprietary software. It uses standard browsers such as Google Chrome to run remote applications and experiences. The quality of the Web 3.0 experience depends on the speed of the internet connection, typically at least 4G or 5G wireless connectivity.

The capability of Web 3.0 to handle 3D immersive media which includes real-world photographs as shown in figure 2 enables users to explore and navigate either individually or in a shared experience with others over the internet. Unlike Second Life, Web 3.0 lacks the inherent ability to host large numbers of users simultaneously, but it does provide the option to explore these immersive experiences through a virtual reality headset as well as through a desktop or smartphone browser. The 360in360 Living memories [3,4] Web 3.0 example shown in Figure 2 is part of a family of demonstrators showing how the Metaverse can host a recording of events and memories. The use of Web 3.0 for social and educational applications that trigger memories and emotions is an example of digital therapeutics.

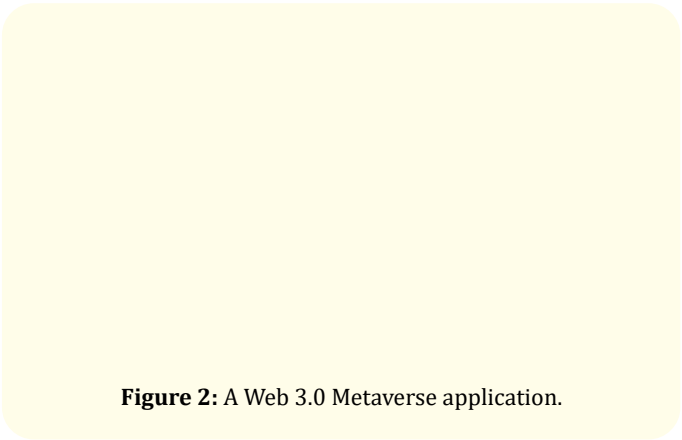

Figure 2: A Web 3.0 Metaverse application.

Facebook (Meta) horizons metaverse platform

The important differentiator between Proprietary platforms, Web 3.0, and the Horizons Platform, including the Oculus store, is the fact that the native Metaverse environment for Horizons is a virtual reality headset such as the Oculus Quest. This means that the applications can usually only be accessed through a VR headset connected to the internet. The equivalent analogous environments would be Google Play on Android devices and the App Store on IOS smartphones.

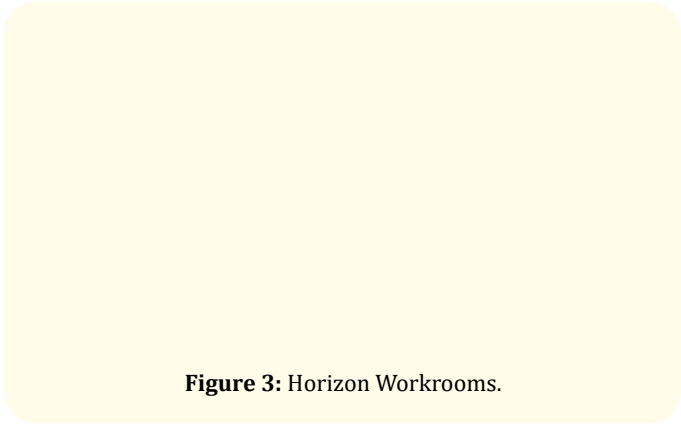

Figure 3: Horizon Workrooms.

This platform provides similar functionality to Second Life in its ability to host large numbers of personalized avatars in what are primarily synthetic (computer-designed) environments for meetings, entertainment, education, socializing, and trading.

As in Second Life, one of the aims of the platform is to build bridges between the real (physical) and virtual worlds so that, in the example shown in Figure 3, it is possible to connect what is stored and displayed on your desktop computer on a screen in the virtual meeting room and interact with other avatars in the meeting not only by audio but also by avatar gestures and actions which mirror those of the participants. This now also includes the ability to be able to control many functions with your hands without the need for handheld controller devices.

Digital therapeutics in the metaverse

Digital Therapeutics involves the use of digital technologies for health and wellbeing. This can include both physical and mental health. Digital therapeutics avoids the use of drugs and consequent risk of addiction and co-morbidity and can support clinical compliance.

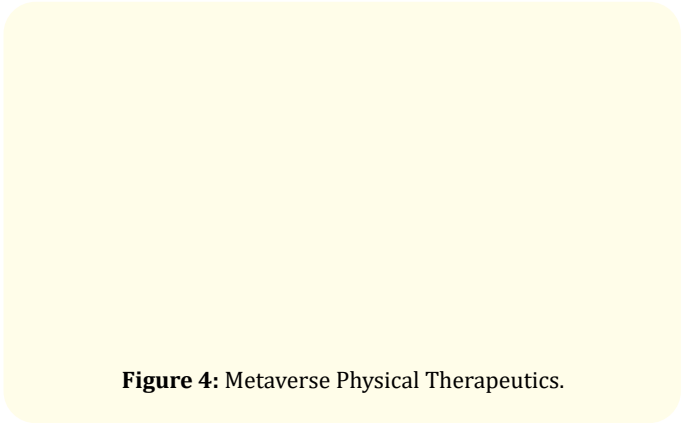

Figure 4: Metaverse Physical Therapeutics.

There are many examples of the Metaverse being used to encourage physical exercise either as an individual or with a trainer or even friends. Applications such as VZFit [5] (Figure 4) and others that use VR headsets include game-like environments where avatars can exercise together and in real-world scenarios based on Google Street-View images. In this way, users can create their cycle routes from anywhere in the world.

Not only do these applications encourage healthy exercise but they also incorporate social aspects similar to what might be experienced in a physical fitness club.

Metaverse mental health and wellbeing

Figure 5: Metaverse Mindfulness Therapeutics.

The inherent immersive nature of the Metaverse, especially when experienced via a VR headset, lends itself to digital therapeutics for mental health. Whether it is the Living Memories Web 3.0 application that provides support for dementia sufferers, applications such as Alcove VR which creates a personalized social space for a variety of wellbeing solutions targeting the elderly or the Tripp [6] mindfulness VR application shown in Figure 5, the Metaverse has massive potential for mental health therapeutics.

Indeed, in the USA, the Federal Drug Agency (FDA) is beginning to recognize digital therapeutics as a proven treatment that can be prescribed and even funded.

Conclusion

This combination of the rapidly maturing disruptive technologies that make the Metaverse a practical possibility and global health and environmental challenges means that the Metaverse is here to stay. This phenomenon which began in 2003 as a practical reality with Linden Labs Second Life today offers many opportunities to use the Metaverse for positive clinical interventions both for self-management of physical and mental health and with the remote support of trained clinicians.

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