

Seeking the Possibilities of the Metaverse Platforms for the Architects and Designers

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Abstract – Virtual worlds and experiences have come in front in the last decades with 3D visualization and programming development. Various companies and startups have projects and release to be part of this transformation, metaverse. Several possibilities exist for developing and using virtual worlds, such as designing digital assets, device production, trade, coding, space creation, documentation, establishing principles, security, advertisement, and real estate. Professionals from diverse occupations are asked to be part of the developer team due to their skills and abilities. Since the metaverse platforms have originated and developed in computer-processable mediums, coders and programmers have taken the lead. Virtual spaces and buildings are an important part of the creation of virtual worlds of which building design activities need to be part. This research is a premise study for seeking possibilities of activities and works that architects or 3D space and building designer handle. In order to explore the components of the metaverse world, an extensive web survey was done among released platforms. They were evaluated in four dimensions: real estate, space creation and modification capability, and event activities. Brief literature is also conducted about metaverse and contemporary situations.

Keywords – Metaverse, 3D modeling, Architect's works, Virtual world creation, Virtual activities

I. INTRODUCTION

For almost sixty years, 3D modeling of buildings and spaces has been done virtually for diverse objectives such as rendering, games, simulations, or calculations. In parallel with the improvements in technology, the information on the attributes has been able to connect to geometries and shapes in virtual environments. For example, semantic knowledge works with the geometrical objects of the 3D model, which makes simulations or calculations of buildings possible before the construction in a BIM environment [1]. These models in virtual environments are digital twins or copies of real-world objects or buildings, making monitoring, predicting, or optimizing possible [2].

In parallel with technological improvements in hardware and software, which are parts of creating, executing, and using 3D environments, the work in establishing virtual worlds has increased in the last

two decades. Companies and startups have tried to develop metaverse platforms with different themes, capabilities, and target groups. The main fact behind this huge flow is to bring users breathtaking experiences with more virtual interactions [3]. Therefore, imaginary virtual worlds, themes, stories, activities, avatars, and games have been created. The existing buildings or public spaces have been copied or used to create modifications. For so many attempts, real-world knowledge has been used as grounding scenarios. The professionals of real life are needed to create, govern, develop, or maintain the security of platforms. This study mainly focuses on the role, skill, or work possibilities in the metaverse. First, a brief literature survey is conducted for the definition and situation of the metaverse, and then the method and results are presented. The research tends to increase

awareness of roles for architects and space designers in virtual metaverse environments.

II. METAVERSE

The word metaverse was first used in the novel 'Snow Crash' by Stephenson Neal in 1992 [4], [5]. Metaverses have transformed from chats and messages to vivid networks and virtual worlds affecting nations and economies [6]. The metaverse is a virtual world that combines the physical and digital worlds, which is still in the early stage of development [7]. Apart from being only a 3D representation or digital twin of the objects or scenes of the real world, the metaverse offers an inclusive virtual world in that users can interact, live and have rights to things. The metaverse applications can be classified in two: metaverse as a tool to solve difficulties and problems in the real world and metaverse as a stand-alone target and highly dependent on the virtual environment [8]. Whether the platform serves as a tool to increase communication and collaboration in the office or make it possible for social meetings, or be a target platform for the game, business, or real estate, the users' expectations are getting more significant in terms of perceptual experience, interaction and discovering new possibilities than the real world.

Various companies and communities have developed metaverse platforms for different objectives like gaming, education, real estate, experience in virtual life, etc. The purpose of the virtual world can be classified into two as game-like, to win or score, and non-game, which is for educational, commercial, socializing, or other purposes [6]. The game can also be an educational or commercial business, implementing these objectives in virtual environments. The potential of a metaverse platform is generally from the ability to do impossible or hard things in the real world. Time, budget, physical limits, and distance between participants make initiating many activities in the real world very difficult. Thus, metaverse platforms and the virtual world become an alternative or new way and medium to do these services.

The birth of the internet in 1991, the first usage of the metaverse term in 1992, and the start of the second life platform in 2003 can be stated as important events near the millennium. Roblox was released in 2006 after bitcoin and blockchain technology were initiated, which were the ancestor of non-fungible tokens [3]. NFT technology, which

is very new in blockchain technology, guarantees the ownership of virtual assets [7].

Buildings and structures are designed and constructed due to these designs, including some documents, drawings, and specification documents. The rationales and facts rule the overall process of building design and construction process. However, in a virtual world, the possibilities are limitless. These buildings, artifacts, spaces, and elements may be redesigned or transferred into virtual environments. Virtual artists, programmers and 3D modelers, and game developers have produced many elements in metaverse platforms. Nowadays, architects and architectural companies tend to design virtual buildings in collaboration with developers to create attention for digital assets. It is important since the skills of the space and building designers are valuable and beneficial, and they should be asked to give effort to the development of the platforms. Figure 1 is the design of Andres Reisinger in which the limits of privacy and publicity are reinterpreted [9]. Figure 2 is designed by PLP architecture company to bridge the gap between users interested in digital and physical estate [10].



Figure 1. Glass box



Figure 2. NFT Skyscraper

III. MATERIALS AND METHOD

The market tries to shape the metaverse platforms and their usage. Big investments in developments and released platforms are present. Since every company and startup tends to get a position in the business and take a role separately, the evaluations and comparisons could be made through released examples. The platforms can be divided into two categories considering the participation of users. The first is platforms for creating and developing platforms or digital assets for the metaverse. Omniverse is a platform for creating and operating applications of metaverse to build custom large-scale virtual worlds [11]. Unity, known by game developers, is also an important platform for creating virtual environments [12]. The first category is not the main focus of this research because they are also known and used by architects and space and building designers. Their capability also matches the works for creating and operating metaverse platforms.

The second category is the platforms in which the participation of real-time users is wanted. The objectives and activities of the platform are different. For example, feeding pets or betting for virtual games could be founded, whereas some platforms are developed for virtual concerts or exhibitions. For the scope of the study, the general activities and capabilities related to designing and modifying spaces or relating to estate and events are more important than other activities, games, or features. Therefore, four items are defined to evaluate platforms after the first initial web survey of metaverse platforms.

- Real Estate: Capability to own and rent buildings and lands. Choice: Yes, No
- Space Creation: Capability of users (non-developers) to create spaces (buildings, open areas). Choice (range):0,1,2,3
- Modify: Capability of users (non-developers) to modify any 3D geometrical elements and objects. Choice (range):0,1,2,3
- Events: Capability of users (non-developers) to create or attend events or activities for collaboration. Choice (range):0,1,2,3

Figure 3 illustrates the main research flow of surveying metaverse platforms. First extensive web survey to find and explore the platforms was handled. It is important to state that this survey is

like finding a black cat in a coal mine. So, also listing the existing platforms is useful for further work. Secondly, the white pages of platforms were read, and pre-investigation was made through the interface of platforms. Finally, all the choices for items were noted among metaverse platforms. The initial observation was considered for choices that could be updated due to detailed examinations and platform changes.

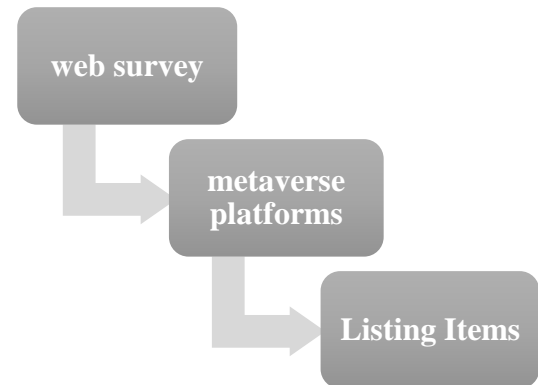


Figure 3. Research Flow

IV. RESULTS

Thirty-four platforms that could be stated as part of metaverse(s) were investigated through a web survey. Released dates, target groups, and activities are different. Table 1 shows the platform names and items; real estate, space creation, modify, and events with ranks. 82% of them have the opportunity to own, sell, buy, and rent virtual lands, spaces and buildings.

Space creation capability is investigated among platforms. 13 out of 34 have no opportunity to create. Also, eight platforms give very limited rights to the user to create spaces. In the range of 3, the average score is 1.32 for space creation.

The capability of the user they can modify 3D geometrical elements and objects was tried to be measured. The average score is 1.88 out of 3, slightly bigger than the score for space creation. Users can modify the digital elements in shape, color, or texture.

Creating and attending events could be seen in the right column, which is 1.65 score on average. Ten platforms do not allow users to create or attend events.

Table 1. Metaverse Platforms

Platform	Real Estate	Space Creation	Modify	Events
Axie Infinity	No	0	1	0
Battle Infinity	No	0	1	0
Bloktopia	Yes	1	2	0
Decentraland	Yes	3	3	3
Everdome	Yes	3	3	3
Ertha	Yes	3	3	3
Hyper Nation	Yes	3	3	3
Illuvium	Yes	1	1	1
Metahero	Yes	0	3	0
Meta Horizon Worlds	Yes	3	3	3
Microsoft Mesh	Yes	2	2	3
Mines of Dalarnia	Yes	1	1	0
Monaverse	Yes	1	3	3
My Neighbor Alice	Yes	1	2	0
Nakamoto Games	Yes	0	2	3
Polkacity	Yes	0	2	1
Roblox	Yes	3	3	3
Roboteria	Yes	3	3	1
Sandbox	Yes	0	0	3
Sansar	Yes	2	2	0
Second Life	Yes	3	3	3
Sensorium Galaxy	No	1	2	3
Somnium space	Yes	1	2	3
Sorare	No	0	0	3
Spatial	Yes	3	3	0
Stageverse	No	0	1	1
Star Atlas	No	0	0	0
Tamadog	No	0	0	0
Uhive	Yes	3	3	1
Ultra	No	0	1	3
Upland	Yes	3	3	1
Verseprop	Yes	1	1	1
Viverse	Yes	0	1	3
Voxels	Yes	0	1	1
Averages	Yes 82,35%	1,32	1,88	1,65

V. FINDINGS

It is clear that in the production process of any metaverse platform, architects and designers have roles and collaborate with developers. They need to increase their level of skills and knowledge of programming, or the interface between these different teams should be managed successfully. The situations and capabilities of metaverse platforms were surveyed, and the results were presented in the previous section. Based on the results, it can be stated that virtual real estate came

in front, and from real-world experiences and works, architects have a profession to be implemented into the virtual world. Space, building, or open areas creation and design are in the works of architects and designers in the real world that should be considered in virtual design. Both the development process of platforms and use and shaping period, design of digital elements, geometries and buildings will be better with the involvement of designers. Modification capability is part of this issue; besides, the users need to take a role and sense in the virtual world. Creating and attending events are beneficial for collaboration and managing everything. Designers and architects are part and leader of the project team in real life that works collaboratively. Findings related to the possible roles of architects and designers in the metaverse are presented below, conducted with a literature survey of the metaverse and a web survey of the metaverse platforms.

- Virtual world design: Work on designing the layout and aesthetic of virtual cities and other environments in the metaverse.
- Building design: Working designing individual virtual buildings or structures, such as virtual homes, shops, and other commercial spaces
- Virtual reality real estate: Work on designing and assessing virtual spaces which can be used as real estate.
- Project management: Serving as project manager, overseeing the development of virtual worlds and environments.

VI. CONCLUSION

This study first presents a literature survey about metaverse and some examples of designing virtual buildings. The method for seeking the possibilities for architects and designers in the metaverse was conducted with a web survey. Based on the findings from the web survey and inferences from the literature, architects' and designers' real-world skills and experiences are valuable for metaverse development and used in connection to their inclination to virtual environments. Both for the production process of platforms and having experience in the involvement of designers will be beneficial. Therefore, increasing space creation and organizing capability of platforms will improve participation. This area is a possible future profession branch for architects and designers.

The limitation is the need for detailed examination among metaverse platforms; however, the research aims to discover the methods of combining the possible roles of architects and designers with metaverse.

NOTES

The metaverse platforms were surveyed in December 2022. The white pages and limited experience on platforms were used to gather data.

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