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Flowing through Virtual Animated Worlds – Perceptions of the Metaverse

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Abstract — **In our daily lives in modern societies, our reality and the perceptions and perspectives that we have about it, are constantly being transformed or shaped by technology. Different types of technology influence our representations, whether physical, social, or virtual. So, we must learn to live along with it. How far and how deep can we go? How aware are we of the time we spend in virtual immersion, and of the significance of the metaverse? To find out possible answers to these questioning, we need to consider a previous and critical question: How do we perceive the metaverse? This is our starting point – or research question. (To go further, we should also research about how we are linked (or submerged) in the metaverse.)**

The aim of the present study is to explore how the metaverse is present in our everyday – considering an adult population - and what are our perceptions about it. It consists on a documental analysis – or meta-analysis – of 15 of the most relevant scientific papers (according to some inclusion criteria), published in the last 2 years, using the Iramuteq and WordCloud MonkeyLearn Software to determine and model the main themes and associated concepts with the metaverse, linked to virtual reality, animation or gaming – this is important in order to establish possible associations between these topics, and analyze, in a broader way, the metaverse. Initial results suggest that people use and consider virtual reality - and the metaverse - as a means of socializing and communicating, inseparable from their daily lives, whether at a playful, learning or even professional level. This exploratory study gave us important findings about the perceptions of the metaverse and clues to verify links between it and the associated themes. Our results will not just help us understand which topics can be more deeply investigated, but also be useful for us to verify the most relevant research items to be considered in a PhD project in preparation.

Keywords— Metaverse, virtual reality, animation, gaming, learning

I. INTRODUCTION

It's amazing to see how technology evolves over the years, shaping a variety of aspects of our lives. We can see this evolution on our work station, family and social relations, on leisure and on bureaucratic aspects of our lives. However, we sometimes do not fully understand, at a conscient level, this new reality brought by technology.

Reality was the illusion, imagination, something not tangible express on reality, it was something intra-mentis[1], the state or quality to be real[2] and even the place that exists and available to be experienced[3]. But what is this reality we see? What does she depend on? Watzlawick (1991) decided to explore this theme and question about reality. In this research Watzlawick found that communication was something that could modify relations and therefore if my communication has a reality behind it (my reality) this can be different or mistaken due to other person's reality. So, it's important to mention the social representations [4] are very important to take in account when talking about information technologies and communication. To understand this reality that technology offers us nowadays we have to dive on the virtual reality concept.

Virtual reality is something recent brought by the evolution of technology bringing new means of communication[5]. Is defined not just has a new communication mean but has an opportunity to dive on cyberspace and to allow us to "exist" in worlds that only exist on our imagination, responsible for creation of virtual environments[6], it can be achieved by different devices[7] and it has developed with immersive experience and digital transformation[8]. Virtual reality has 4 key elements to considered: virtual world, immersion sensorial feedback and intractability[3]. So now we understand that our reality and the virtual reality are connected and that technology has a major influence on them whether physical, social and virtually.

With technological development, the evolution of games is also clear, and it is something that these days continues to be investigated. Some authors mention that gaming has been around for a long time and is defined as being structured by rules[9] and they are the ones to be the first applications of the metaverse[10] with their virtual worlds. Digital games or video games began in the 1950s and were initially created to demonstrate the potential of computers[11]. With the technological evolution and the adhesion that these games had, the gaming universe emerged.

Nowadays, it is possible to enter this world through consoles, tablets, computers, smartphones or any other electronic device. With the evolution, the gaming area responded to all our desires, as well as our environments and offered us experiences and opportunities that we didn't know we wanted after all[5].

Looking at animation, in games, the reality will combine the virtual – and the virtual characters that assume almost real roles –, generating new realities, languages and types of communication, becoming either specific to a single individual or global, transforming a society[12], and should understand this perception at an ethical and even political level[13]. Heilig said "virtual reality is dreams [14]", and we now know that is only possible because of animation and it's huge power to transform our reality.

Gaming is clearly the founder of Metaverse, as it was games that tied us to a screen, enveloping us in an alternate world. It is not that reality and history are unimportant, in the gaming universe these concepts are just not a priority[15], and some authors also add that gaming increasingly becomes a lived experience and the limits between the Metaverse and what is gaming and what is not[5]. In some cases, the limits

are not clear and we can say that all games in the gaming universe, more or less real, are all promoters of Metaverse.

With this understanding we are now able to comprehend the Metaverse, this concept can be defined has the post-reality universe, a perpetual and persistent multiuser environment merging physical reality with the digital virtuality [16], and is a 3D based world based on a virtual reality simulation to express real life[17], mixing gaming, social networking, augmented and virtual reality for a more digital engagement[18]. The Metaverse can be achieved via internet with augmented reality devices, game consoles, computers, tablets or mobile phones[7].

Metaverse, virtual reality, physical reality and technology bring us the possibility to live beyond the physical aspect of our reality environment. We can live in a conjunction of a real physical reality and a created virtual reality or we can choose to live, for some time, in a fully virtual world (games). We this decision comes the type of immersion we choose to experiment or live, and this is up to the individual and what he pretends or wants. And it's these choices available that bring us to questions like, how aware are we about the virtual immersion? And what's the significance of the metaverse? And how is it perceived and conceived by us?

II. Objectives

The main goal of this study is to contribute to understand how the metaverse is present in our daily lives – considering an adult population – and what are the perceptions about it.

III. Method

This study consists on a documental analysis of 15 of the most relevant scientific papers, regarding this main theme the Metaverse? The 15 papers where selected with the following criteria: have been published in the last 2 years; having keywords mentioning metaverse, virtual reality, gaming or some derivate from the 3 main keywords; having a title that would mention metaverse, virtual reality, gaming or some derivate from these concepts; having an abstract that mention metaverse, virtual reality or gaming; and, after a more profound analysis understand the relevance for this study.

The data gathered from these articles was analysed using the Iramuteq software and WordCloud generator with machine learning and AI by MonkeyLearn Software, through frequencies, relevance percentage and concept grouped analysing the content of the textual data. This helped us determine and model the main themes and associated concepts with the metaverse, linked with virtual reality, gaming and animation.

IV. Results

A. Analysis of most frequent key word

In this analysis we opted to understand what the frequencies were of the most import key words mentioned on the 15 articles we analyzed, using Iramuteq software.

For this analysis we opted for a descriptive analysis, according to the most frequent words (see Table 1). We observed that the most frequent key words are "Metaverse (F = 57), "Virtual" (F = 34), "Reality" (F = 30), "Technology" (F = 26), "VR" (F = 21), "User" (F = 18), "World" (F = 17), "Study" (F = 15), "Perceive" (F = 15), "Experience" (F = 15).

TABLE I.   FREQUENCY OF KEY WORDS MENTIONED

Key word	Frequency (F)
Metaverse	57
Virtual	34
Reality	30
Technology	26
Vr (virtual reality)	21
User	18
World	17
Study	15
Perceive	15
Experience	15
Online	12
Consumer	11
Game (gaming)	10
social	9
Interest	9
Education	9
Digital	9
Augment	9
Internet	8
Interaction	8
Escape	8
Research	7
Real	7
Physical	7
Immersive	7
Environment	7
Design	7
AI (artificial intelligence)	7
Section	6
Potential	6
Learn	6
Intention	6
Factor	6
AR (augment reality)	6

For a better understanding we transformed this data into a word cloud figure, using Iramuteq software (see Figure 1).
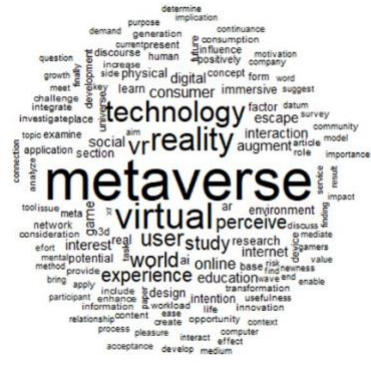
Fig. 1. Word cloud frequency key words

The Metaverse is connected with the Virtual, Reality, Technology, Virtual Reality, User and World key words – users recognize the metaverse in their study, work or social experience.

B. Analyzing relation of concepts mentions

For this analysis we also used frequencies and added the % of relevance, using the WordCloud Software by MonkeyLearn. We made an analysis of the text from all articles and observed the relevance of the most important concepts or phrases mentions (see Table 2).

We observed that the most frequent concepts or phrases mention are "augmented reality" (F = 5, % = 100), "perceived ease of use" (F = 2, % = 84.73), "perceived pleasure" (F = 3, % = 80.92), "metaverse" (F = 37, % = 73.29), "augmented reality device" (F = 2, % = 72.52), "virtual world" (F = 13, % = 68.37), "perceived curiosity" (F = 2, % = 61.83), "complimentary term" (F = 2, % = 61.83), "perceived usefulness" (F = 3, % = 61.83) and "perceived enjoyment" (F = 2, % = 61.83).

TABLE II. FREQUENCY OF CONCEPTS MENTIONED (MOST RELEVANT)

Key word	F	% relevance
augmented reality	5	100
perceived ease of use	2	84,73
perceived pleasure	3	80,92
metaverse	37	73,29
augmented reality device	2	72,52
virtual world	12	68,37
perceived curiosity	2	61,83
complimentary term	2	61,83
perceived usefulness	2	61,83
perceived enjoyment	2	61,83
presented vr for education	1	54,20
summarized dimensional learning environment	1	54,20
metaverse has the potential	1	54,20
meaningful vr consumer experience escape	1	54,20
presented sequential research agenda	1	54,20
internet has a huge importance	1	54,20

Key word	F	% relevance
suitable environment for metaverse	1	54,20
derived metaverse of utilization	1	54,20
issues have important implications	1	54,20
proposed series of hypotheses	1	54,20
augmented virtual reality device	1	54,20
based metaverse of utilization	1	54,20
metaverse has the opportunity	1	54,20
employed structural equation modelling	1	54,20
important implication for education	1	54,20
driven vr consumer experience escape	1	54,20
based 2d e learning tool	1	54,20
comprehensive investigation of ai	1	54,20
virtual reality	8	53,47

Some concepts were highlighted for their relevance, such as "augmented reality" (100%), "perceived ease of use" (84.73%), "perceived pleasure" (80.92%), "metaverse" (73.29%), "augmented reality device" (72.52%) and "virtual world" (68.37%) (Figure 2) (Table 2). This articles, above all mention the importance of the reality and virtual worlds, has well has the perceived pleasure and curiosity regarding the metaverse concept.

For a better understanding we transformed this data into word clouds figures (see Figure 2, Figure 3 and Figure 4).
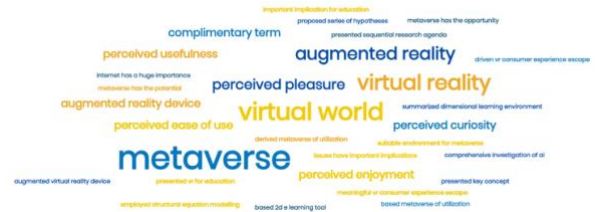

Fig. 2. WordCloud frequency of concepts mentioned (most relevant)

Fig. 3. Word Cloud frequency of concept mention (higher relevance)

Fig. 4. WordCloud all concepts

C. Analysis of key word relation

For this question we used Reinert method, from Iramuteq software. With this we were able to understand the linkage between the main concepts refer in the articles.
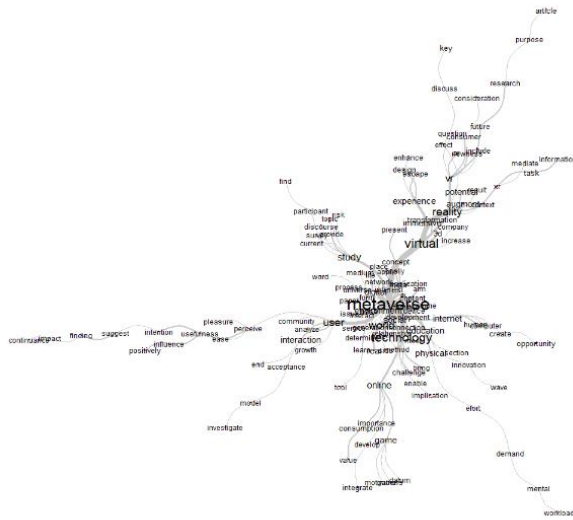

Fig. 5.   Key word relations

Observing the relations between the key words we can observed that the Metaverse is in the center of all the other concepts words. Then we have the virtual concept, where we can find the connection to the reality and the virtual and virtual reality concepts. The technology linked to the online (environment), game and its importance has an integration and consumption concept. And we have the user, which reveal us the importance of his interaction, acceptance and intention for the main concept.

V.   CONCLUSIONS AND FUTURE WORK

The metaverse has bring us a whole perspective of reality allowing us to join technology on the creation of new immersive ways to live our lives. Digital transformation have come into our lives because of the metaverse[7], and we should be aware of the big bang imminence from this concept[19] because we never know that "a thing that seems trivial – a mobile phone, a touchscreen, a video game – becomes essential, and ends up changing the world in ways both predicted and never seen considered[20]".

Regarding our research question how is the metaverse perceived and conceived by us, it is possible to determine the most relevant concepts related with the metaverse: Virtual, Reality, Technology, Virtual Reality, User and World because they are the base of the metaverse concept. We also found relevant concepts has perceived of pleasure, ease of use, curiosity that where study to positively influence the ease of use, usefulness and attitude towards the metaverse technology[17], giving us more clarity on how we perceived the metaverse.

The metaverse is "meta" and "universe" and describes it has an immersive experience engaging technological virtual environments that are beyond a physical reality[21].

However, we must keep in mind that the user or individual are the center of all this evolution, from technology pursue for new realities, has we could also see in the results the perceived

ease of use, pleasure, curiosity and usefulness are relevant, and I add mandatory, for the metaverse, virtual reality and technology concepts to continue to thrive and seek for more transformations and evolution.

Computer games are the first application of the metaverse[10] and possible because of their shift shapes and free possibilities of creating virtual worlds, and therefore the significance of games appears naturally on our results (see Table 1, Figure 5)

The gaming area has responded to all of our wishes, to our environments and offers us experience and opportunities that we do not know that we wanted[5]. This is only possible because of the virtual reality, creating the possibility of an immersion experience and transformation of new worlds. But one of these virtual worlds would be possible if the animation did not exist. Animation function is to be a portal between fantasy and reality, the virtual and the social using technology[22]. Or, in other words, we may virtually play as if we were playing in a social context – via the metaverse. "One way or another if human evolution is to go on, we shall have to learn to enjoy life more thoroughly.[23]" and the metaverse make that even more possible.

The present findings gave us important knowledge about the associated concepts with the metaverse, as well as an idea of how it is conceived and perceived. This will also help us to understand which topics can be more deeply investigated and which concepts are most relevant to be considered on the PhD project in preparation.

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