

# Believability in Virtual Reality: a Proposal to Study Brand Communication in Metaverses

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**Abstract:** The article presents a theoretical and empirical exercise to the possibilities of brand communication in virtual reality (VR), proposing an analysis/creation tool for emerging metaverse platforms, applied to the field of brand communication (immersive and 360-degree images, multisensoriality, first person perspective). Methodologically, this study uses an empirical approach, qualitatively evaluating an advertising piece in VR and highlighting the dimensions of believability that, in some way, affect brand communication. Results show three relevant dimensions: realism, interactivity, and engagement with the plot.

**Keywords:** virtual reality, metaverse, technology innovation, expanded media environment, brand communication.

## **Acreditabilidade em Realidade Virtual: uma Proposta para Estudar a Comunicação de Marca em Metaversos**

**Resumo:** O artigo apresenta um exercício teórico e empírico às possibilidades de comunicação de marca em Realidade Virtual (RV), propondo um instrumento de análise/criação para plataformas emergentes de metaverso, aplicado ao campo da comunicação de marcas (imagens imersivas e em 360 graus, multissensorial, perspectiva em primeira pessoa). Metodologicamente, a pesquisa apresenta abordagem empírica, explorando peças de RV qualitativamente, destacando dimensões de acreditabilidade que, de alguma forma, impactam a comunicação da marca. Os resultados enfatizam três dimensões relevantes: realismo, interatividade e envolvimento com a trama.

**Palavras-chaves:** realidade virtual, metaverso, tecnologia de inovação, ambiente midiático expandido, comunicação da marca.

## **Credibilidad en Realidad Virtual: una Propuesta para Estudiar la Comunicación de Marca en Metaversos**

**Resumen:** Este artículo presenta un ejercicio teórico y empírico a las posibilidades de comunicación de marca en Realidad Virtual (RV), proponiendo un instrumento de análisis/creación para plataformas metaverso emergentes, aplicado al campo de la comunicación de marca (imágenes inmersivas y 360 grados, multisensorial, perspectiva en primera persona). La investigación utilizó como metodología un enfoque empírico, explorando cualitativamente piezas de RV, que destacan dimensiones de credibilidad que, de alguna manera, impactan en la comunicación de la marca. Los resultados enfatizan tres dimensiones relevantes: realismo, interactividad y compromiso con la trama.

**Palabras clave:** realidad virtual, metaverso, tecnología de innovación, ambiente mediático expandido, comunicación de marca.

This article assesses the possibilities of brand communication in virtual reality (VR) environments, using a research approach, based on the concept of believability in VR, aiming to propose a tool to help researchers and creative professionals to analyze and/or create content for emerging metaverse platforms.

The content produced for VR platforms (metaverses, simulations, videogames, and others) may appropriate the intrinsic characteristics of the medium (immersion, 360-degree images, multisensory interfaces, first person perspective, and others) to create new possibilities for visual, sound, and interactive narratives by digital mediated environments expanded beyond the flat monitor screen.

The phenomena of immersion and sense of presence created in the communicational process between users, devices, and the VR environment (Borba, 2020) produce an effect of believability of experiencing digital simulations as if they were part of physical reality (Pausch et al., 1996, 1997). This concept of believability, in turn, when applied to advertising and brand communication in VR gains importance when thinking on strategies, aesthetics, mechanisms, dynamics, discourses, and ways of communicating brand intentions to the audience in a complex digital space (Steuer, 1992).

Thus, based on these considerations, how does believability may impact brand communication in advertising actions supported by VR? To answer this question, it's imperative to describe the concept of believability as well as underlining its dimensions of analysis. In methodological terms, more than presenting a theoretical basis on believability in VR (Burdea & Coiffet, 2003; Kataoka et al., 2019; Pausch et al., 1996, 1997; Slater & Wilbur, 1997; Thon, 2008; Tori & Kirner, 2006; and others), this study uses an empirical approach and qualitatively evaluate an advertising piece in VR based on contemporary advertising ideas (Borba et al., 2015; de Gauquier et al., 2019; van Kerrebroeck et al., 2017; Kotler et al., 2017, 2021) in order to highlight the presence and the effect of believability, which, in some way, influences brand communication in VR.

In short, results show the importance of realism/vividness, interactivity, and engagement with the plot to understand brand communication in VR. These three dimensions constitute the phenomena of believability in VR and are a proposal to researchers and advertising professionals to study and/or create content for immersive metaverse platforms.

### **Some Relevant Aspects about Believability in VR**

Videos on the Internet with people who “became” a meme because they experienced an embarrassing situation when using virtual reality for the first time are common. Falls, imbalances, and other feelings of disorientation are usual in these videos, which, in a way, show the formation of conflicting moments in the perception of reality of people involved.

Several aspects contribute to the belief of users that they are immersed in a virtual reality. Steuer (1992), for example, states that the vividness of the projected images and the interactivity with objects in the represented environment are the main factors to promote an immersion. In turn, Burdea and Coiffet (2003) add that the computer capacity of processing graphics for VR experience also plays an important role in the construction of an illusion of presence. According to the authors, both (1) the image resolution (the aesthetic details of what is seen) and (2) the latency of the system that supports VR (the response time of interactive commands) influence the degree of immersion of users.

More recent studies, such as those by Longhi (2016) and de la Peña et al. (2010), show that 360-degree viewing is also essential to make users feel surrounded by the digital content, after all, they can “see more of the environment by moving their head up, down, or sideways, the overview of the scene allows an impression of really being in that scenario” (Longhi, 2016, p. 11). On the other hand, Borba (2020) highlights the ability of interactional devices to be increasingly able to capture user commands (gestures, movements, voice) and modulate bodily sensations that

stimulate different senses (sight, sound, touch, smell), creating a narrative for the whole body—a full body narrative.

All aforementioned aspects show that the VR content may have some sort of relationship with realism (the vividness of images) or interactivity (the naturalness of interactions). However, not satisfied with these two dimensions, Pausch et al. (1996) published a seminal paper suggesting that, besides imagery and functionality, the storytelling in VR environments would also significantly influence the immersive experience of users. In other words, as well as the quality of the three-dimensional design or the possibility of manipulating virtual objects by sophisticated devices influence the production of an immersion in the digital environment, the quality of the narrative plots of pieces would further influence the degree of immersion (Pausch et al., 1996).

This understanding is important to analyze psychological aspects when constructing an immersive VR experience that may go beyond technical elements. Thus, initially, applying the theory of believability in VR to study brand communication contributes to the possibility of identifying and problematizing sociocultural and semiotic aspects of communication messages intrinsic to the existing process among users, devices, and virtual environment. De Gauquier et al. (2019) and Kotler et al. (2017) state that brands can strengthen their personality in the market by producing experiences with potential consumers. Therefore, VR experiences bring consumers closer to the reality of products and services (de Gauquier et al., 2019; van Kerrebroeck et al., 2017).

When Pausch et al. (1996) published the article *Disney's Aladdin: first steps toward storytelling in virtual reality*, the British author Mel Slater also conducted experiments with users, aiming to assess aspects of the perception of reality of people who explored immersive scenarios (Slater, 1999; Slater & Wilbur, 1997). These two studies helped support the concept of believability. Slater and Wilbur (1997), for example, encouraged the understanding of elements constituting immersion and the sense of presence in VR, as, even being different, both may simultaneously influence the perception of reality of users.

For these authors, immersion is exclusively linked to the sensory experience of users (their body) and, therefore, a process mediated by interactional devices. Thus, the physical body of users also feel the sensory stimuli applied to their representation in the virtual environment (their avatar) by sensory equipment that modulate sequences of inputs and outputs, such as mediated stereoscopic vision by VR goggles, the depth, texture, and intensity of sounds, the tactile feedback when touching virtual objects with haptic gloves, and others. In turn, Slater states that the sense of presence would be linked to the psychological experience (the mind) of users and, thus, a process of shift of attention between user and plot with variations of degrees due the subjectivity of individuals (preferences, desires, fears, memories).

Slater (1999) contributed to Pausch's findings, showing that in VR, the senses of presence and immersion coexist and, when well developed, can create a complex perception of reality. To explain this complex perception of reality, the author used the concept of believability, changing the idea that storytelling would be more important than realism or interactivity and putting them on the same level. Slater (1999) named the relationship between immersion and the sense of presence as plausibility of inhabiting a new reality. Regardless of the term, both Pausch et al. (1996) and Slater (1999) referred to the notion of inhabiting the VR environment, but one author considered more the subjectivity of the experience of users with the plot while the other considered both objective and subjective aspects to the same extent.

To better understand the properties of believability and the phenomena of immersion and presence, Borba (2020) conducted a theoretical-practical study that suggests a structure of believability in VR from dimensions including the characteristics of the medium and everything that can be found in a VR experience, resulting in three dimensions: realism, interactivity, and engagement (Figure 1).

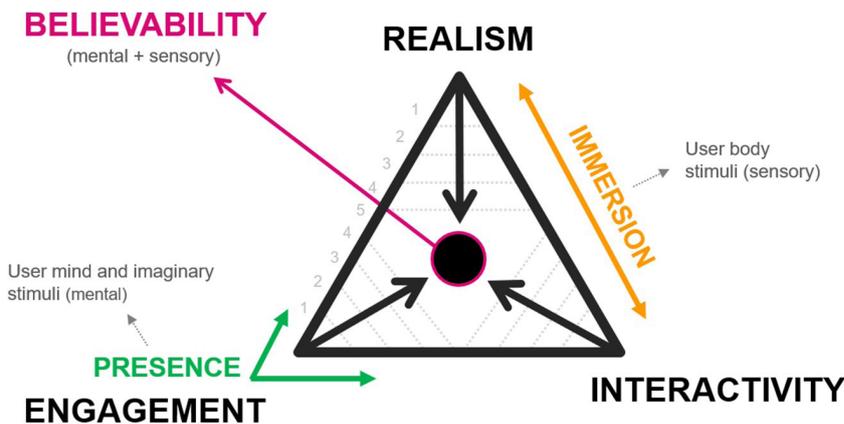


Figure 1: Three dimensions of believability in VR (realism, interactivity, and engagement) Note. Borba (2020).

**Methodology**

Based on the research question (“how does believability affect brand communication in advertising actions supported by VR?”), this study applied an exploratory methodology. In line with the theoretical chapter, an empirical approach was used to evaluate an advertising piece in VR and collect qualitative data, analyzing the dimensions of believability that, in some way, may affect brand communication.

Initially, the dimensions guiding the data collection and the metrics were established for analysis and later discussion on believability in the construction of brand communication in VR.

The dimensions of analysis were selected based on Borba (2020), as the author presented a triangulation of attributes that conceptualize believability in VR according to other authors: Steuer (1992), Pausch et al. (1996, 1997), Slater and Wilbur (1997), Slater (1999), Burdea (2003), Tori and Kirner (2006), Thon (2008), Borba et al. (2015), Kotler et al. (2017), van Kerrebroeck et al. (2017), Kataoka et al. (2019), and de Gauquier et al. (2019). Therefore, realism, interactivity, and engagement were used as guidelines for a qualitative research (Table 1). The Lufthansa VR Experience was the advertising piece used<sup>1</sup>.

<sup>1</sup>The full video is available at [www.youtube.com/watch?v=OPRcbFrp9Y4/](http://www.youtube.com/watch?v=OPRcbFrp9Y4/). Accessed in August 14th, 2022.

Dimensions	Attributes to be observed
<b>Realism</b> 	Aesthetic aspects, which includes imagery attributes related to the content design (shapes, scales, proportions, perspectives, depths, textures, colors, lights, and shadows), technical attributes of the digital image (resolution, latency, and stereoscopy) and sound aspects of the space/objects (timbres, intensities, and pitch).
<b>Interactivity</b> 	Aspects of navigation in the landscape, commands, orientation and manipulation of 3D objects, spaces, and contents in the virtual environment, including the relationship between users and devices that transpose their intentions of movements from the physical to the digital space. In interactivity, observing the behavior of objects inside the scene when manipulated by the representation of users (their avatar) is important.
<b>Engagement</b> 	Aspects of the storytelling, plot, and narrative during the VR experience, including the story to be told and the details that constitute the experience, such as missions to be accomplished, goals to be achieved, elements in the scenario that helps create meanings, and others.

Table 1: Attributes of the dimensions of believability Note. Based on Borba (2020).

To analyze how the three dimensions of believability may affect brand communication in the Lufthansa VR Experience, a Likert scale was used, in which one point corresponded to a low effect and five points corresponded to a high effect. Even though this approach was applied only to one example, it may help other researchers and advertising professionals to study brand communication in VR environments and metaverses (Kim, 2021; Saker & Frith, 2022).

## Discussion

The discussion on data about believability applied to brand communication in VR is a qualitative exercise. First, an observation was made to the advertising piece (Lufthansa VR Experience), seeking to identify its communication structure in VR and the communication message proposed by the brand. During the observation, descriptive notes were taken about the three dimensions of believability and their relationship with brand communication.

The technical composition of images in VR was made by two components in the advertising piece. Basically, it was a 360-degree video serving as a basis for the content enunciation. During this main stage, the layers of computer graphics (3D objects) were inserted, allowing users to interact with the content inside the scene. Besides seeing the scene by a head-mounted display (HMD), users used a joystick to freely manipulate the objects. Moreover, sounds were projected by speakers built into the structure of a physical armchair, in which users were sat (in the showroom of the brand in a giant fair). Users wore no headphones; however, it did not avoid the interference of ambient noise.

The narrative of the experience included four scenes: a) understanding the aircraft space; b) interacting with in-flight services; c) visiting a beach; d) outside VR. In the first scene, users could only see the aircraft space from an aisle seat in the business class, as they could not choose seats, and move their head in 360 degrees to see people around, organizing themselves to sit, storing bags, and even saying “halo” (“hello,” in German). In the second scene, a flight attendant brought the meal to the user, making it possible to know the types of food served on board. Users could also manipulate objects with the hand holding the joystick. In the third scene, without any explanation of a teleportation, users found themselves sitting in a beach chair in front of the Golden Gate Bridge in San Francisco with a postcard of the bridge itself in hand, which could be freely manipulated. Finally, in the fourth scene, the experience ended with a real-world interaction with the actor who played the flight attendant, who approached users and gave them a physical version of that same postcard.

Realism reached three points on the Likert scale. Initially, the advertising piece had a high degree of realism, as users saw the interior of the aircraft by a high resolution 360-degree video. Moreover, the movements and dialogues of people in the scene helped create a realistic atmosphere, as, while users saw the space around them from a first-person perspective in an aisle seat, they could hear and see people acting naturally. However, the interaction with the objects included in in-flight services (cutlery and glasses) showed a strong contrast of realism, as the visual quality decreased because 3D objects did not have a realistic design. The virtual hand of users, which allowed the real-time visualization of the physical hand movements, had even less graphic quality, as its morphology did not imitate textures, colors, and details of the skin of a human hand.

Interactivity also reached three points on the scale. Moments of interactivity with 3D objects were few in this experience. In the first scene, users could only move their head in 360 degrees to look around the aircraft. During the second and third scenes, interactivity significantly increased, as the movements of the arms and hands of users were transposed to the digital space in real-time by tappers inside the joystick. Besides natural movements, users could pick up, manipulate, and use the 3D objects over-layered on the 360-degree video. Despite this interactivity, due to the lack of tactile elements, users could not feel the textures, temperature, or different shapes of the virtual objects.

Engagement reached four points on the scale. The storytelling was well elaborated, following a chronological order in four scenes. The experience of engagement with the brand begins at the time when users agree to sit in the armchair that simulates the seat of an aircraft in the Lufthansa’s showroom. From the moment when they put VR goggles on, the very idea of a space occupied by other passengers creates a feeling of being in that place and not exactly in a media environment with a 360-degree video. In the first scene, users are agents and use their own head movements to know the space around, its characteristics, the details and accessories on the screen, and the table in front of them, understanding the space to accommodate during a flight (product/service demonstration).

Engagement continued to increase in the second scene, in which users focused on in-flight services and freely interacted with virtual objects, and the third scene, on the beach in San Francisco, a destination of Lufthansa on sale during that period of the year. In this case, the attempt to involve users with the natural wonders of the beach and/or the architectural structure of the famous Golden Gate Bridge are visual resources that serve as advertising appeal to increase the desire to be there physically. Finally, when taking off VR goggles, in physical showroom of the brand, users were introduced to the actor who played the flight attendant who had served them the meal in the virtual space.

The VR experience of this brand values the use of realism, interactivity, and engagement to build believability in the perception of users. However, although realism works properly by audiovisual resources that produce immersion, engagement worked most efficiently in this brand communication in VR, as unfolding the plot with different situations awakens in users a desire to maintain attention to everything in the virtual environment, making them believe they were there. Figure 2 presents a graph for believability regarding the brand communication of the sample studied.

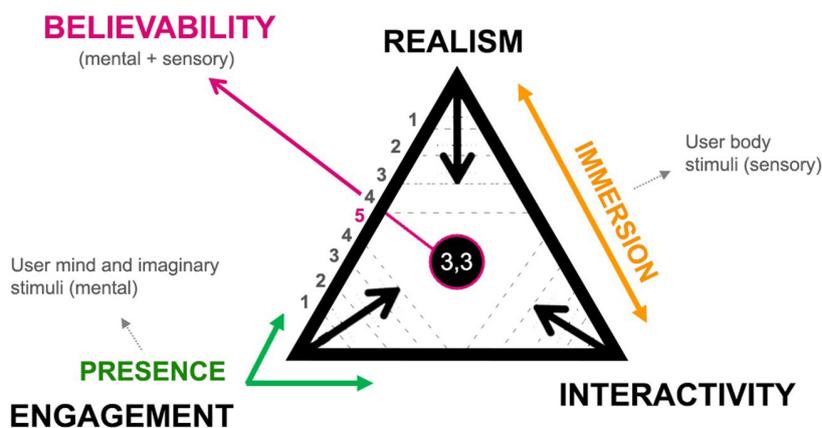


Figure 2: Evaluation of believability in the brand communication VR experience of Lufthansa  
 Note. Developed by the author based on Borba (2020).

**Conclusion**

This article presented a theoretical and empirical exercise to the possibilities of brand communication in VR by believability. Even in its first steps, this study discussed the concept of believability in VR, applying it to an advertising piece and seeking to understand how its dimensions (realism, interactivity, and engagement) may affect brand communication.

The contents produced for the VR environment appropriates the characteristics of the medium (immersion, sense of presence, first person perspective, 360-degree and 3D images, sounds, multisensory interactions, and others) to create for users an illusion of being inside the media environment.

The studied case, in which the brand used this communication medium to present their services to consumers, showed that believability can be both (1) an interesting

way to guide the creation of a relevant VR experience for users and (2) a tool to study brand communication. Studying the properties of realism, interactivity, and engagement existing in the VR experience allowed the data collection and analysis that guided the discussion on the effects of the phenomena of immersion and sense of presence, consequently leading to the conclusion about the degree of performance and/or influence of believability in brand communication in VR.

Therefore, assessing the believability applied to brand communication in a VR experience may help researchers and professionals study and produce content for emerging immersive environments, such as metaverses, simulators, and videogame. Future studies may use a larger sample of advertisements.

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