

# Authenticity in VR and XR experiences: a conceptual framework for Digital Heritage

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## Abstract

*Although people search for authentic, memorable and meaningful experiences in cultural tourism, these requirements are not considered as part of a virtual or hybrid experience and therefore are not considered keys in their design. This paper presents an analysis of the concept of authenticity, extending its meaning well beyond the traditional interpretation in ICT. Through the study of how this concept has been developed and used in different domains and through an exploration in the wild, adopting a Cultural Probe Kit approach, it has been possible to identify the three interconnected dimensions of authenticity, their characteristics and design strategies that should be adopted to strengthen the perception of authenticity in the users of Virtual and Hybrid experiences.*

## CCS Concepts

• **Human-centered computing** → Interaction design process and methods; **Empirical studies in interaction design**; • **Applied computing** → Arts and humanities

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## 1. Introduction

Cultural Heritage is key in the development of human beings and society; it can foster wonder, personal transformation and creativity [RPK\*19]. Studies in the tourism sector have shown that people search for "authentic, memorable and meaningful experiences" [Che18]. Are interactive experiences with Cultural Heritage really designed taking into consideration these expectations? How can we increase "authenticity" in the design of XR and hybrid experiences? This paper aims at analysing the concept of authenticity in interactive media and specifically interactive cultural experiences, with the goal of defining a theoretical framework, identifying its dimensions and characteristics, and finding appropriate indicators that could be used to measure the level of authenticity and the effectiveness of Virtual and Hybrid experiences. Our running hypothesis is that authenticity is a multi-dimensional concept, that goes much beyond the realism, and that an authentic experience is the one that a user takes possession of (cognitively, emotionally and sensory), re-appropriating a virtual environment, the narrative and interactions that happen in it, transforming them from something impersonal and far, into something personal and closer to the user. To prove this hypothesis we have carried out a state of the art analysis in the literature, in the fields of Philosophy, Psychology and Social Sciences (although those three domains are pretty much interconnected), Computer Science and Human Computer Interaction (Ch.2). We have then explored the concept of authenticity through a Cultural Probe Kit (Ch.3) and finally identified its characteristics,

definition and design strategies that could be adopted in the development of XR / Hybrid applications (Ch.4).

## 2. State of the Art on Authenticity

In philosophy and psychology individuals have always been treated in their relations with others and the physical world, and the concept has been studied in various fields. Its origins can be traced back to the Greek philosophers. It is derived from the word *authentikós* (*autós*, self), and has been the subject of philosophical currents [Lac14]. In philosophy, there has always been a focus on the individual, at least in the western world, with a distinction between the private self and the public self, dictating its connection with the society; self-judgement became (who am I, what is the authentic myself) crucial [Var20]. Until Hegel [Heg02], the concepts of sincerity, honesty and moral values were used more than authenticity, linked to the potential of knowing oneself and acting accordingly, with the specific goal of being considered honest and truthful by the society. Moreover, authenticity was used to define the potential of being true to oneself for personal benefits, with no relation with the society, leading to a modern ethic of authenticity and independence (autonomy), in a continuous inner search for a balance between identity and authenticity. This explains the importance of recent studies, in the field of in psychology and social sciences, about extrovert / introvert traits: extroverts have been found to perceive authenticity more easily [Fle07], [Eps79], [Mis68], and [Sny87]. Nevertheless, it has been also experimented that introverts asked to act extroverted (flexible behaviours) on purpose, have the

same capability of perceiving an authentic experience [Fle10]. In line with this, [WGEP21] defines “Subjective Authenticity” as the judgement that one is acting in accordance with one’s true self-concept. The possibility of letting individuals express themselves, finding their meaning and reflecting, is therefore key in the development of the perception of authenticity. Furthermore, the moral characteristics and values, as already analysed by existential philosophy [Car15], seem to give importance to the meaningfulness of experiences. Particularly significant, in this direction, is the work of Jasper, psychologist and philosopher, who, in its “Psychology of the WordViews”, wrote that authenticity is what touches a person’s deeper self and endures, evolves, and changes together with the individual [Jas]. He introduces the concept of depth or intensity (in contrast with superficiality), time and evolution. We can derive that an authentic experience, therefore, is something that is perceived by the individual as personal and close to the inner part of the self and meaningful; it is not the same for everybody and it may change over time and, most importantly, it can be nurtured, by soliciting the self in its complexity and in its relations. Although the self has been always considered a reference in the definition of authenticity, and beyond the consideration of the role of society as a reference for the moral values, the inter-relations with “the others” have been even recently considered relevant and studied, such as in socio-linguistics. In this field, the concept has been analysed as referring to language, intended as a tool we have to exchange information and build and maintain interpersonal social relations with others. It is, in fact, the essence of an authentic life, which involves acting and expressing emotions in ways that are congruent with physiological sensations, beliefs and cognition [Lac14]. Language is also recognised to contribute to shape concepts and to stabilise and organise knowledge acquisition [Dov16]. According to Coupland [Cou10] and Austin [Aus75], authenticity has a performative aspect, the “authentication”, intended as an active process that involves verbal exposition and dialogue, and as a tactic that allows individuals to establish authentic or inauthentic participation in social groups. The value of verbal exchange emerges also in the “Mediated Dialogue” approaches proposed by [Mck20]. Although authenticity is seen today, in the “Age of Authenticity”, as a pervasive ideal, impacting social and political thinking [Var20], this concept also extends beyond the self and the others. It has been used since the beginning, as to refer to something faithful to an original or “of unquestioned origin or authorship”, encompassing a process of verification [Var20]. This process has been recognised as having three aspects: it was considered as the action of separating “the true thing” or “original” from counterfeits and duplicates, as in the definition of “Indexical Authenticity” by [Gra04]; as that of identifying verisimilitudes (whether or not an object conforms to an observer’s expectations about how the object should appear), as for “Iconic Authenticity” [Dei89]; and as a way to correctly identify “the origin, authorship or provenance of an object”, as for “Nominal Authenticity”, defined by [Dut03]. In addition to tourists’ expectations [Che18], in tourism studies emerges the relation between authenticity and realism, accuracy and objectivity [RB12]. Specifically, objectivity cannot be separated from the ability of the visitors to discern the veracity of the sights or experiences they encounter. Moreover, tourists are found to give importance to authentic material objects, when they are produced by skilled artisans, or to rituals and events, when they are associated with traditional out-growths of cultures [Wan99].

Some contend that a sense of place can be created [TBM17]. In any case, as Cohen notices when defining “Constructive Authenticity” [Coh19], the authenticity of an experience is variable, negotiable, and context-dependent [Sal97]. In Computer Science and Human Computer Interaction, and specifically in works related to VR experiences, the main dimension considered as relevant is that of the “world”. In fact, it is frequently solely associated in general with the sense of presence and immersivity level, that involve the embodiment in a digital space [Kro16], [Loo99], [Sta98] and with the realism of the virtual environments, that depends on the devices [Kro16]. A different aspect emerges in studies about serious games, where randomness and unexpected elements are considered fundamental in the perception of authenticity [Gri17].

### 3. Exploring Authenticity through Cultural Probe Kit approaches

Following the analyses indicated above, we conducted a field study on how people perceive authenticity in the context of cultural heritage. We have adopted and designed a Cultural Probe Kit (CPK) [Gav99]. CPK are usually used to gather information about the daily lives of a group of individuals and gain a deeper understanding of people’s experiences in different contexts. They are tools for self-reporting, that allow participants to observe, think about, and describe their experiences, in situations where it is not possible to undertake direct observations, or when it is to be avoided any interference of the researchers. The obtained results are qualitative. We have already and successfully used this approach [PBA23] [PB22] and in this case our main objective was to gather inspirational information to better define authenticity and understand its characteristics, what causes it and how it is triggered. We decided to take into consideration an homogeneous group of potential users of Digital Heritage interactive applications: university students enrolled in the University of Bologna’s Master of Digital Humanities and Digital Knowledge program, 25 people between 22 and 46 years old, coming from different countries. The CPK was made of a number of Activities and of a Diary, all organised and provided in a small paper book. The activities included tasks (a) on the perception of authenticity in a museum context; (b) on the perception of authenticity in daily life; (c) repeated behaviours and observations; (d) authenticity in digital experiences. Specifically, we aimed at exploring through the above-mentioned tasks the following questions: Q1) whether the perception of authenticity is connected with emotions; Q2) which emotion best describes an authentic experience (among Fear, Happiness, Sadness, Disgust, Anger, and Surprise); Q3) which senses and therefore stimuli, are mostly involved (among sight/Visuals, hearing/Sounds, touch, sense of smell, and taste); Q4) whether the authenticity is related to trustworthiness and reliability; Q5) what is identified by individuals as a truly authentic digital experience; Q6) which correlation there is between realism of digital scenarios and authenticity; and Q7) whether the stimuli and triggers were the same in everyday life and in digital experiences. During (a), we asked our sample to perform several tasks during a museum visit, such as taking a picture of what they perceived as authentic and another of what was considered inauthentic, commenting on them (Fig.1). With (b), participants had to write a story about a significant and authentic episode that happened in their life, possibly uploading a picture of it. With this activity we

left open to the possibility to fully explore thoughts and feelings regarding the perception of authenticity. (c) In order to be able to track how frequently participants had real experiences each day, users had to write down those experiences in the diary. Finally, (d) included a number of questions to be replied online (we used Google Form). A total number of 25 anonymised CPK were collected. Most important findings regarding the many characteristics of authenticity emerged, partially overlapping with the studies. One of the new insights, for instance, regarded the role and importance of the perception of an “atmosphere”, as discussed in Ch. 4. The subjectivity, as expected, was high, but we still could draft interesting conclusions that are reported in the next subsection.



**Figure 1:** 3 photos of the CPK with comments: (left) drawing: “it’s the perception of something profound [...] and therefore authentic”; (middle) globe: “an experience that we actually lived [...] real people doing something not because I was taking a photo”; (right) ceiling: “Looking at the roof, I felt like entering somebody’s house”.

#### 4. Discussion

From the study carried out and presented in ch.3, a number of keywords emerged, in relation to authenticity and its dimensions: Self Identity, Reflection, Self-expression, Meaningfulness, Intensity, Evolution, Cognition; Others Language, Dialogue, Relation; World Verification, Realism, Reliability, Accuracy, Objectivity, Embodiment, Context, Randomness and Unexpected. The “performative” aspect instead is very relevant and it can be found transversally in the three dimensions. In the CPK we have then reached the following main conclusions: 1) the three dimensions (self, others, world) emerged clearly from activities, stories and comments (Fig.1); 2) emotions have a key role in the perception of authenticity (not necessarily positive emotions) as the meaningfulness of the experience; 3) social component of the experience (being together and exchanging thoughts through dialogues) is relevant (fig.1, middle); 4) the validation process and identification of truth and reliability was considered of higher importance than the realism; 5) a sense of familiarity is an effect of authenticity; 6) the “atmosphere” of the environment was also identified as impacting the perception of authenticity (illumination, sounds, etc.). Summarising, we could confirm that authenticity is characterised by three dimensions that are interconnected and that most of the components are peculiar to one of them (i.e. others-dialogue, world-atmosphere). We have summarised the framework identifying the key terminology with domains and main components:

SELF:

- **Personal Disposition** (Identity, Extroversion, Self-expression, Attention, Sense of Direction),
- **Personal Context** (Values, Meaningfulness, Choice, Goals, Challenge, Expectations),
- **Cognition, Emotions, Sensations** (reflection and self-monitoring, feedback),
- **Personal Embodiment,**
- **Familiarity,**
- **Level** (Depth-Intensity),
- **Time** (Personal Evolution)

OTHERS:

- **Language** (Exchange, Dialogue),
- **Social practices** (Relation, Interaction with others and Feedback, Challenge),
- **Social embodiment,**
- **Social norms,**
- **Social unpredictability**

WORLD:

- **Verification** (Validation, Realism, Reliability),
- **Physical Context** with its rules,
- **Action** (Interaction with the world, Feedback),
- **Atmosphere** (illumination, sound, etc),
- **Time** (time flow),
- **Environmental embodiment,**
- **Comfort,**
- **Unpredictability and Unicity** (Randomness, originality)

A Self encounters, identifies, and collides with the Other (who is also a Self) in a temporal and spatial environment (the World), through a system of interactions in order to have an authentic experience. Authenticity starts therefore with the self; it touches its deepest self and endures, develops, and changes with it. Humans are recognized as social creatures because of their ability to make and sustain connections with others. The ability to relate to others is a hallmark of humanity, and people have developed various methods of communication and interaction to establish and maintain social ties. An individual’s authenticity is influenced, personally and socially, by the environment, in which he or she lives. The proposed framework shows the three dimensions as cardinal points of a space-time within which the different components act and interact. Using the framework with its components as a guideline, it is possible to design virtual experiences that better satisfy visitors and users expectations. For instance, in the self-dimension, it is possible to work on user identification within an application and on the development of the sense of belonging, as in the selection of a character or in the personalisation of the virtual experience; or we can adopt emotive or provocative storytelling strategies, to trigger the curiosity and improve meaningfulness [RPK\*19]. In the Others dimension, designers can develop collaborative experiences and solicit exchange dynamics including a guide or a master, as in Role Playing Games; or they can design hybrid experiences in co-presence to improve social embodiment. In world dimension, it is possible to develop not only 3d interactive environments, but also focus on their reliability providing users with tools that support their validation and interpretation process; or designers could

strengthen the embodiment, improving the atmospheric effects of the environments (light, material, sound effects), or include unexpected elements. After the development of the Authenticity Conceptual Framework, we have also started to define the methodological tools that could enable us to measure the authenticity of an experience. The goal is to develop a questionnaire for the analysis of authenticity in virtual experiences, both in the early stage of the creation (pre-production) and in the final stage of the prototype, to determine whether the experience created is sufficiently authentic.

## Conclusions

The Authenticity Conceptual Framework that we have drafted has identified a number of components that refer to three different domains. These components are studied in literature and have also emerged in our recent experiment with CPK. This work was used to demonstrate how the design of virtual experiences could benefit if specific strategies are adopted to increase the perception of authenticity along the three axes. It has also shown how, only after having developed the theoretical ground, it is possible to identify measurable components that could help designers and developers to co-create and to test their application to better answer visitors' expectations. We have also understood that Authenticity has a key performative property: it is an action with actors, tools, context of execution, space, time (it is not static but it develops) and modalities of execution. We have therefore defined Authenticity in Virtual Experiences as:

*a multi-dimensional concept, made of three main domains (self, others, world) and of components (reflection-emotion -sensation, exchange and embodiment), working by touching the deeper self of the user, through performative actions that transform the unfamiliar (distant) into familiar (close).*

The question of the connection between those three dimensions remains open. If we increase one of the dimensions, i.e. by introducing a certain component, does this impact the other dimensions and how? Are they so inter-correlated that, when we increase one, we should also expect (and also therefore design) a decrease on one of the others, or both? This is, for instance, what happens in photography, when, in order to obtain a well exposed image, photographers set ISO, F-Number and Shutter speed, in accordance with a priority and goal. To make an example, if we design an experience where the self and world dimensions are well designed in their components (i.e. a user is immersed into a realistic environment with a nice atmosphere, particularly meaningful for him, and he is following a storytelling that is leading him to reflect or feel great emotions, etc.), do we have to decrease the "other" dimension, to keep the perception of authenticity (i.e. the designer does not introduce other users to let him concentrate and focus on the experience)? We are planning in the future to use a VR prototype as an experimental setting to verify this last question.

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