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ESSENTIAL VALUES IN THE DESIGN OF AUGMENTED-REALITY APPLICATIONS FOR MUSEUMS

Ioana Grancea[*1] and Viorel Grancea[2]

[1] *'Alexandru Ioan Cuza' University, Faculty of Philosophy and Social-Political Sciences, Carol Avenue no. 11, Iași, Romania*
[2] *'Gheorghe Asachi' Technical University, Faculty of Material Science and Engineering, Dimitrie Mangeron Avenue no. 41, Iași, Romania*

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Abstract

Augmented-reality applications are rapidly making their way to contemporary museums. Can we draw a set of clear standards to define 'excellence' in this field? While technical standards have been discussed in other works, we want to address the intellectual and experiential value of these newly-formed hybrid spaces. We look at religious books as examples of museum exhibits that can become subject to augmentation and wonder what exactly can be won and what exactly risks being lost in the process of their 'augmentation'. The values we discuss in this article as being essential to the users of this technology can be translated into a set of key-questions that need to be raised with regard to the design of any augmented reality installation with cultural purposes.

Keywords: museum, communication, liturgical, texts, augmented

1. Introduction - the use of augmented reality in museums

In a previous article, published in the *Proceedings* volume *of the European Symposium on Religious Art Restoration and Conservation* [1], we have discussed some of the possible functions that *augmented reality* technology could fulfil in museums that display religious artworks. For those readers who are not familiar with that particular contribution of ours, we use this introduction to outline the theoretical foundations of the research we are undertaking in the domain of museum communication. We start from a brief account of what *augmented reality applications* are programmed to do, before proceeding to the essential functions they can perform in museum spaces.

Augmented reality is a term used to define a "real-time direct or indirect view of a physical real-world environment that has been enhanced by adding virtual computer-generated information to it" [2]. In other words, augmented reality technology superimposes digital media content upon the real world in real

[*]E-mail: ioanagranceacomunicare@gmail, tel.: +40 722 331 104

time, thus increasing the illusion that the overlaid content is 'actually there' in one's immediate surroundings. The results of augmented reality differ from those of virtual reality. In virtual-reality systems, the computer-generated world has no touch point with the physical environment in which one is situated at the moment of immersion. Augmented reality, on the other hand, produces what we might call *hybrid spaces* on a perceptual level: one sees simultaneously the real world, as it is, and the add-ons generated by computer, created so as to fit in the real environment.

The digital media content overlaid on the real environment can perform several functions, ranging from the offering of user-friendly guidance to visitors, to the expression of sharp criticism of corporate greed or public politics, for example. Tourism applications include explanatory text that appears next to important monuments in a city or archive footage that allow visitors to see what the street they are walking on looked like in the past, while activist applications include black clouds that are projected next to the headquarters of major corporate polluters, or ironic commentary and counter-argumentation displayed next to advertising billboards [3].

Augmented reality technology can also be used to provide insights into the cultural context that gave birth to the artefacts that are displayed in a particular museum. By pointing the *augmented-reality device* towards a particular artefact, the visitor could see – next to the image of the object – additional text or additional pictures or videos that offer a richer background for understanding the meaning and the import of that artefact. Such detailed accounts could be related to the *thick descriptions* of anthropology. Let us explain briefly that concept:

Anthropological theory holds that to understand particular human manifestations, one has to go deeper into the layers of cultural significance that attribute a particular meaning to a particular behaviour in a particular context. Clifford Geertz sees *thick descriptions* as systematic attempts, informed both by theory and direct observation, to uncover the conceptual structures that underlie the acts performed by people. The aim of this endeavour is "to draw large conclusions from small, but very densely textured facts; to support broad assertions about the role of culture in collective life by engaging them exactly with complex specifics" [4].

Such densely-textured facts are often at the base of religious art, so they need *thick descriptions* in order to be properly understood by the audience. If museum communication is to be true to its core mission – that of telling real stories about specific artefacts belonging to one domain of human activity – then it follows that *thick descriptions* are always needed. Unfortunately, it often happens that excessively *thinned* descriptions of many religious artefacts (many of them used in worship until this day) leave visitors in the dark about what it is they really see. In these cases, visitors are not initiated in the cultural background that could reveal the *actual* meaning of this object – namely, the meaning invested in it by the community that uses it.

In our previous article, we offered particular instances of such thinned descriptions and showed how augmented reality devices could fill this void and offer visitors a *thick understanding* of the artefacts: visitors could discover, in the form of multimedia content overlaid on the real objects, information about the people who created those artefacts, about the people who kept the tradition of producing them, about the people who did major efforts to preserve this tradition, about people who use them with religious purposes, about the significance believers attribute to those artefacts (from the past and to the present day), about the cultural and spiritual atmosphere in which those artefacts perform symbolic functions.

In short, the general question posed by our previous article was 'what use can be given to augmented reality technology in a religious-art museum?' and our answer was that augmented reality devices can help deliver *thick descriptions* with a 'contemporary' flavour. But this statement can only serve as a very general purpose for the creators of augmented museum experiences. It needs to be translated in operational goals and specific objectives, with well-defined standards for the delivery of *thick* descriptions. We need to take into account the emotional needs and the cognitive possibilities of the audience, not just the technical resources of augmented reality technology. In this new contribution, we want to clarify the conditions that need to be met for AR content to successfully perform its function of ensuring a *thick understanding* on the part of museum visitors. The overarching question of our present research is: *What criteria should be kept in mind when designing these augmented reality experiences for museum goers?*

In what follows, we invite readers to reflect on some of the essential values that can ensure a *thick understanding* of museum artefacts. We take religious books as an example of a museum exhibit in need of *thick* descriptions. To develop a *thick description* of an artefact, one needs to outline the layers of significance it entails. To ensure a *thick understanding* of an artefact, visitors need to be actively involved in discovering the meanings that people have attributed to it, in the time of its creation and in the course of its evolution and large-scale use.

2. Getting the audience involved

In a contemporary museum the attempt to deliver *thick descriptions* in a classical manner would face a major challenge: contemporary audiences are said to be impatient, rapidly bored by the 'speech' of a museum guide. Direct participation in the process of discovery seems to be the only way that visitors can be motivated to pay attention. Perhaps now more than ever experiential learning is a 'must'. The entertainment framework that has taken over society, not just children, requires novel forms of stimulation. If we want people to follow what we have to say, if we want them to remember it and further share it with friends, we need to get them involved in the process of discovery.

Can *augmented reality applications* do that? Can we say that they create a sense of involvement and direct participation, just because they imply things appearing at the touch of a button or of a screen? Indeed, in augmented reality applications a new level of *projected reality* appears next to the real objects in one's surroundings. But this does not entail *participation* in its own right. It does not mean real involvement. Essentially, in what concerns the cognitive processing performed by the viewer, this version of augmented reality does not go too far from watching TV, although technically so much progress is being made. Overstimulation of one's sight does not ensure a higher level of participation.

Designers who develop augmented reality experiences should become aware that *multimedia* content is too often rendered equivalent to *interactive* content! We are told by the marketers of these augmented-reality devices that 'children are getting bored with passive learning, and augmented reality can make them get involved'. While a 3D character that pops out of a drawing may be involving on an emotional level, it still requires nothing 'active' on the part of the viewer. The character pops out, and viewers watch. In fact, it can be even less cognitively challenging than the classical version of a drawing on a paper: had it not popped out in its 3D shape, maybe children would have made an imaginative effort to invest it with a human identity, they would have had to construct in their mind the image of the character suggested by the drawing or by the text they have in front of their eyes. On a commonsensical level, we know that the absence of a given image is more cognitively challenging than its presence. Children develop their imaginative skills particularly when the object is not shown *per se* in front of their eyes.

In a similar vein, footage of an old city centre superimposed on the modern one is not any more *involving* than a documentary film we watch on any other type of screen. Indeed, it is impressive to have it on the screen of your smartphone, to have – as it were – 'control' of its appearance and disappearance [5]. Being in a place while watching projected images of older versions of that very same place is undoubtedly fascinating, but can it be considered to be an (inter)active experience? What exactly do we do, except for pointing the device in a specific direction? That is not worthy of the name 'activity'. If people do not move, if they do not interact with one another in this new *augmented space*, if they do not have cognitive or physical tasks that are challenging enough to make them experience a state of flow in this new environment, we are not very far from the paradigm of passive learning.

Visitors in a museum should be cognitively stimulated, invited to think, learn, remember, contribute, move, draw, play, and discuss with peers [6]. If the technical limits of augmented reality devices do not yet allow for that, then museum curators and the other designers of visitor experiences should also include moments when visitors take a break from the visual immersion in the augmented space and perform more active tasks. A museum experience should not be understood only in terms of the dominant technology they are in contact with. Designers should not only be concerned with technical features, but also

with the human features that can make people attracted to the special corner of the world that is the museum. When technical limits shall be overcome, augmented reality applications could involve direct contribution on the part of the users, direct participation in each other's augmented space (for multiple users), as well as direct manipulation of objects in the augmented space.

In addition, people's reactions can become a wonderful feedback channel for museum guides and curators, because these reactions can reveal important aspects of visitors' perception and (lack of) internalization of the core message that the museum is trying to convey, aside from being a pleasant social activity [7]. This could further help in implementing changes in the visitor experience to ensure the museum's relevance and appeal, as well as its capacity to deliver the core messages in a clear and memorable way. This importance of visitor feedback has always been true, but with augmented reality we are moving into a new dimension of this type of participation: visitor books can now be much more appealing by inviting co-participation in the projected world. Visitors can see – in the form of digital layers of information superimposed on real objects – a selection of what previous visitors have written for them. Thus, writing could be done more richly, bearing in mind a reader from the future who may interpret a certain artwork from the museum in light of the interpretation offered today by ourselves.

But this co-participation and re-symbolization of museum spaces must also have clear limits. From our point of view, the truth of an artefact is not fluid, flexible, changing with each interpretation. Its purpose, meaning, and scope are all decipherable in authorial intentions.

3. Respecting the truth of the augmented reality content

Kaleidoscopic user-generated spaces are appealing to the designers of augmented-reality experiences, but creators must pay attention to the risk for content to be severely diluted. Thick descriptions of museum artefacts must not be replaced by slogans integrated into a wider web of meanings spun by uninformed audiences. Moving the emphasis from the author to contemporary user-created content may actually mean a switch to *thinned* descriptions and *thinned* understanding, leaving room for subjective re-interpretations, postulating truth a relative, old-fashioned, disposable notion. We do not agree with that approach.

In augmented reality applications**,** physical reality is *enhanced*, enriched by additional layers of information. But who guarantees for the truth of the augmented reality content that is projected? How can we define misinformation in this new context? On a large scale, these are challenging aspects for specialists in law, epistemology or ethics. But on a smaller scale, that of museum communication, it is most often a matter of individual conscience, as it can be exercised in the creative work performed by augmented reality designers and museum curators. For them, an important guide to truth is author meaning.

One of the most important principles is to postulate *author meaning* as *the starting point* for telling the story of an artefact. The creative concept of any exhibition should be rooted in author meaning. *Thick descriptions* could then be built around the values that dominated the time in which this author created this work, the relationship with other creators of that time, the tensions and the influences that are detectable in his work, the tradition they drew from. If the author is not individually known (as it is the case with many results of archaeological research), the focus could be placed on what we are entitled to assume about the community that made it possible for that object to be created.

Also, it is important for museum communication to be explicit about the limits of what is known – and knowable, for that matter. The 'input spaces' that compose the hybrid augmented space need not be products of fantasy, especially when displayed in a museum. Otherwise, the cultural relevance of the entire endeavour may be lost, and the entertainment framework would completely take over, loosening the truth of the content to the point where the museum would cease to have any value of its own. That would not only be unfair to its purpose from a cultural or historical point of view, but it would be an awful marketing strategy, because the differentiating point of the museum would be lost. A museum must remain faithful to a set of core values, even when the winds of entertainment are blowing with full force, as it is today. Pathways to success can be found in this attentive combination of true informative content with entertaining occasions for direct contributions on the part of the users. But the organizing framework of the hybrid spaces thus created needs to remain that of honestly and responsibly communicating a truth about humanity.

We personally disagree with re-makes, actors interpreting the author and any scenario that completes the known facts with products of imagination. If there is nothing about the author that is available in visual form – a photograph, a piece of text written by him, a signature, or a statue or a monument that are directly pointing to the author's work, if there is no available visual material, we would recommend the path of suggestion: find something that can be symbolically, metaphorically or metonymically related to the subject that is discussed. If that is not possible either, than explanatory text should be sufficient. Alternating text and images may, in fact, be more cognitively stimulating for the audience, even if it is less impressing from a technical point of view.

4. How these recommendations could be applied to liturgical texts displayed in a museum

In the case of religious books displayed in a museum, people could be invited to anonymously write the thoughts and feelings they experienced upon their personal meeting with that liturgical text. For too long, this museum-mediated meeting was basically a meeting with the cover of the document, not its contents. This amounted to an excessively *thinned* perception of these books. But with augmented reality applications, visitors could have the opportunity to

read in detail any page of the book, because each page could become augmented reality content after being scanned by museum curators. In addition, visitors could have them translated – augmented reality applications that provide instant translations are widely available at the moment.

So the meeting would be different: visitors could see the text itself, they could attempt to read it from a subjective perspective, and then they could be invited to write a personal confession related to that text. After a selection performed by museum curators, some of the personal contributions could remain there, attached in digital format to (specific pages of) this book and available to future visitors who would be willing to read the thoughts shared by their predecessors. This can build into a wonderful community that could extend through the years and would be less vulnerable to external destruction. What a surprise would it be to see the comments written a hundred years ago to that same prayer, with all the detectable differences in form of expression, with all the detectable similarities in what concerns the spiritual life. This community, defying age and earthly death, would be a contemporary reply to the wider community that exists in the heart of Christianity for ages. Many prayers are hundreds of years old, and often they are still in use today in liturgical life, and Christians relate to their content. They are still relevant, because the truth they hold is that of the human heart, in its deeper essence, not in its external and ever-changing manifestations. The survival of these texts for so long and their living force today could be perceived in a new light by museum goers who are directly involved in this experience of contributing with a prayer or a message addressed to the generations that will come after us. The responsibility towards spiritual legacy would be experienced in a new way by the contributor.

This engagement with the text could spur further questions from the visitors, and these questions could be addressed to the museum guide or, as this technology evolves, they could be typed in their augmented reality devices, with pre-recorded answers to many of the possible questions. Visitors may ask, for example, why read somebody else's words in prayer? Why is it that the Church recommends written prayers from a book, when people could simply produce an authentic prayer based on their own state of mind?

Museum curators and augmented-reality designers could use the projected content to introduce visitors to the fact that believers see these texts as attempts to be in communion with the Holy Spirit that dwells in the Saints who wrote them. Believers engage with these words from a first-person point of view in trying to inhabit that spiritual realm in which they were written and to have their hearts nourished with the presence of God. On the other hand, these prayers are relevant to their readers because they are written in the name of humanity, and their sense is not autobiographical: when the first person 'I' or 'we' is used, usually the reference is to the human nature that resides in each of us, with all the light and darkness it entails. The Holy Spirit is praying from within these words, confessing our sins as humans and opening us towards the works of *theosis*. It is as if, with the first person it uses, the saint who wrote these prayers

in divine inspiration is taking humanity's sins upon himself, addressing God to heal these wounds.

In what concerns the aforementioned standards of truth, the projected images would need to be faithful to the initial meaning and to the initial *ethos* of these texts, but also to the people who have historically been involved in the printing of liturgical books. Their personal struggle to get this accomplished can be integrated in a visual story. Many of them sacrificed a lot in order to see these works published, many of them died before seeing this dream accomplished. There are documented, real-life stories that are worth being told, showing to what length these people were prepared to go in order to preserve this invaluable treasure for the Christians who would come after them and would want to use the spiritual insights contained in these words.

One possible solution would be to focus the digital content on *who*, rather than *what*. Maybe the divine inspiration in writing these prayers cannot be visually shown, but it can be suggested by visual cues indicating the state of deep concentration, humbleness of the heart, clearly identifiable in archive photography of monks or nuns, in their gestures caught on camera. Another category of *who* envisages the people who have historically been involved in the printing industry of the holy books can be shown. There are beautiful real-life stories that are worth being told and known by the young generation, who probably has very *thinned* representations of what it meant to get a book published in those days.

One example is the artistic-suggestive documentary played at the Museum of the Bible in Washington D.C., called 'Experience the Book'. The film focuses on historic events that had the Holy Book at their centre [Full name of the film that is discussed here: *Experience the Book – Museum of the Bible*, 2017]. We personally appreciate the cinematic feeling enticed by the film, although we would have opted for more suggestion and less explicit *showing* of character faces.

If direct recordings of those people do not exist (as it is probably the case with many of the liturgical texts, whose authors, translators, publishers, and users have not been photographed or filmed), suggestive scenes can be created on purpose, not explicitly showing an identifiable person: a character that is filmed from behind as he leaves riding his horse, a close-up with a writing hand are just two of the examples that could be used in a neutral way, connoting the meaning of that action without falsifying anything about the looks, the air, the gesture of the historical character.

Also, symbolic imagery or text accompanied by expressive music can be used to express the interior struggle, or the external barriers and obstacles these people were facing. Designers of augmented reality experiences would need to ensure a unitary style of this imagery and that they are compatible with the *ethos* of the Church to which the texts belong. Alternating text with imagery can be another solution if no visual content is available – and in some cases it could even be more productive for the cognitive grasp of the contents that are presented.

Throughout this complicated endeavour of suggesting the *who*-s involved in the production and reception of liturgical texts, it is important that we remain in the horizon of mystery, of respect for what we do not know, for what we cannot know. It is this air that should be kept all the way through the experience, no matter how far augmented reality technology will go.

We need to leave room for people to breathe, to take in the message, to reflect on it, to discuss it with others, to leave a personal mark. *Thick descriptions* must not be *heavy* on the users. Otherwise, if we try to show too much, we may find ourselves belittling or underplaying the importance of the mystery, of the untold, of the overwhelming gentleness that dominates spiritual life. In other words, we may find ourselves mistaking the explanatory framework suitable for the subject matter just because technological advancement and 'fun' necessities have implicitly pushed us in the wrong direction.

5. Conclusions

People who enter a museum have different aspirations, starting with social purposes and ending with the attempt to escape routine. Some of the visitors may be passionate about the technical explanations that accompany the objects displayed in the museum, while others may be more interested in their higher significance: what these artefacts tell us about human essence, about what we are, what we used to be, and what we can become.

In an attempt to explain our fascination for museums, Coleen Leth has suggested that we keep returning to museums because they are "living, breathing, active records of *us* – in the most universal and global sense of the word" [C. Leth, *Seeing the Past as Present: Why Museums Matter*, presentation at TEDxOxBridge]. Of course, she had a rather universal 'us' in mind (understood as the soul of humanity), but in fact, the evolution of augmented reality can end up keeping records of visitors themselves, embodied in their personal contributions. If they participate in activities that involve them directly, and then give their consent for further use of the material they have contributed with (shared thoughts, memories, poems, drawings, photographs, and so on), this contribution could become the content of future augmented reality projections attached to those museum exhibits. This would mean that the content of the museum would not only grow in its ability to talk more richly about itself, but it would also be more informative about how other people engaged with that very same content, in different moments of history.

However, more content is not always good news. *Thick descriptions* may be a legitimate aspiration for anthropologists who are keen on the subject they are investigating, but museum goers are not in the same position. This is why an important caution to bear in mind is that more information delivered in a digital form does not automatically bring about a superior understanding on the part of the visitors.

Hybrid spaces born out of the two distinct inputs (the real artefacts and the digital content superimposed on it) can be cluttered, confusing or distracting from the joys of a museum visit. Therefore, simplicity, single-minded propositions, clarity of thought should become a constant preoccupation of museum curators and designers of augmented-reality experiences. Even if a lot can be said, even more now with the possibilities of this new technology, one must have the courage to cut, to give up a part of the content, to rethink the digital content so as to direct the visitors towards understanding the subject matter and, most importantly, to help them grasp the tone, the atmosphere, the personality that are characteristic to the subject matter.

Therefore, designers of augmented reality experiences could work on the basis of a *creative brief* that would include specific answers to the following questions: What are the visitors *doing* while being immersed in this augmented space? What are they doing before this immersion? What are they doing after it? What is the most important message we want to leave with them after they step out of the museum? What specific occasions did we create for them to engage with that message, to do something about it, be it in the form of interpersonal play or personal commentary?

In addition, it is important to remember that artful-immersion moments need to be alternated with purposeful silence-moments when visitors are advised to look at the real world around them, to interact with other visitors, and perhaps write down impressions or participate in role-play aimed at helping them understand better the situations recounted in the digital content.

Finally, augmented reality content needs to be faithful to the topic it represents. When developing creative concepts that would lead a museum visit, one must keep in mind the primacy of *creator meaning*. *Thick descriptions* of all cultural artifacts have always placed a great emphasis on the meaning that the creators of an object attributed to it. It is in *the truth* of the subject matter that we must find the starting point, the route, and the destination of the museum visit, no matter how hard we are pushed by an entertainment framework to think otherwise. Museums must make the most of their cultural and spiritual assets, not downplay them for the sake of being entertaining.

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