The future of technology in museums

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Introduction

In recent years, a growing emphasis is placed on the applications of new technologies in museum spaces and on the potential advantages that such applications can have on the overall visitor experience (Freeman et al., 2016). This emphasis does not only originate from museum professionals but also from the public, since technology has become a standard that visitors more often expect.

The application of new technologies in museum spaces offers certain advantages to their visitors, with their effect being characterised as "catalytic" (Parry, 2007, p.140). It has been argued that technology brings museums closer to wider accessibility, inclusion and democracy (MacDevitt, 2018). Moreover, the digital turn embraced by many museums "helped to support a realignment of museography from object-centred to experience-centred design" (Parry, 2007, p.81). However, a question that is central to the use of technological innovations is what exactly is a desirable museum experience? Does technology support, rather than overshadow, museum objects? Although a large corpus of literature is devoted to the advantages of technology for museum visitors, the actual evaluation of its effects or possible implications and challenges remain an under-studied area.

Thus, the aim of this paper is first, to explore some of the challenges that museum professionals and visitors face due to the increasing application of new technologies in museum spaces. Second, to envision and discuss the future of technologies in museums.

New technologies in museum spaces: the need for a critical approach

Current research on new technologies in museum spaces, usually explores the technical aspect of technological applications and the difficulties encountered in the development of such projects or the lack of professional development of museum professionals on digital applications (Carvalho & Matos, 2018). Thus, current discourses on the relation between museums and digital technology solely focus "on projects and their technical considerations" (Cameron & Kenderdine, 2010, p.3).

However, we argue that the focus of using such technologies in museums should be the visitor experience rather than the technology itself, and unfortunately very few studies were carried out having the area of user experience as their primary focus. It seems that current research lacks the necessary critical thinking on the implications and possibilities of new technologies and so new technologies remain "largely unmapped in terms of a critical theory for cultural heritage per se" (ibid). Having said that, current discussions on the uses of new technology reflect the two different approaches adopted by museum professionals, who have either "lamented or celebrated these developments" (Witcomb, 2010, p.37). In the chasm between these contradicting views, new technologies are either "a threat to the established culture and practices of the museum complex or an opportunity to reinvent itself and ensure its own survival into the twenty-first century" (ibid, p.35). However, this chasm is unconstructive, since neither approach can fully encapsulate the actual dimension and impact of new technologies in museums.

The challenges of current interactive technologies used in museum spaces

Several challenges are identified in current literature. The main ones are grouped in six main categories.

Category 1: Distraction

Several scholars argue that new technologies isolate visitors, and take their attention away from the physical objects on display. Thus, digital technologies, if not used properly, may start to "compete" with the physical museum, rather than complement the physical museum. In many cases, visitors may spend "more time with the system than with the original object", resulting in a "displacement" of the object by the technology used (VomLehn et al., 2005, p.133).

Category 2: Screen dependency

Most technological applications rely on mobile devices or touch screens, which, as several scholars note, has created an absorption of visitors into screens, called "the heads-down phenomenon" or the "lure of the screen concern" (Mayr & Wessel, 2007, p.18). While some argue that screen dependency has aided the inclusion of younger visitors, it may also degrade the reflective experience of a museum visit, impede an escape from the visitors' daily routine and create a tension between physical and digital experiences, with digital experiences gaining more ground rather than the promotion of personal human interactions.

Category 3: Technical/ practical issues

Several issues were also noted from a practical point of view. For example, users of VR and AR applications argue that most HMDs are uncomfortable, cause headaches and nausea, do not allow users to see the environment around them and, because of these characteristics, cannot be used for long (Kain, 2016). Another very important limitation is the high cost of implementing such technologies in museums. Apart from quickly becoming obsolete, such technologies are in the constant need of updating

and maintenance, which requires investment of both money and the appropriate personnel.

Category 4: Social issues / visitor- group relationship

New technologies may change the "visitor-group-relationship" (Mayr & Wessel, 2007, p.18). Although visiting a museum is often a social occasion, most technologies used in museums are designed for a single-user and do not allow "shared experiences with other visitors" (ibid). Thus, the museum visit is transformed into an individual experience which reduces social interaction to the minimum.

Category 5: Exhibition flow issues

Technology in museums may also affect the exhibition flow and thus the overall experience. As noted by the evaluation studies of Ciolfi et al. (2001, p.605), "kiosks interpose themselves between the visitors and the objects, preventing the visitors from maintaining their physical proximity to the exhibit". Thus, such touch screens or other applications may break "the condition of flow and engagement" that the visitors experience during the museum visit (ibid). Technological applications using fixed interactive applications may also create an impoverished experience to the rest of the visitors waiting in long queues for their turn.

Category 6: Ethical and data protection issues

Many technologies currently offered in museums, have the advantage of providing personalised content to the visitors. However, this personalisation requires the collection of many personal data, which in turn raises concerns on issues of data protection and on the willingness of museum visitors to share such information.

Discussion and Future Directions

The review of the challenges of new technologies used in museums leads to a need to re-think and possibly re-conceptualize the type of experience that such technologies should encourage, so that new proposals on the development of new technologies in museums are formed. These proposals will be useful for museum professionals, technology developers, and evaluators who want to focus on the user experience.

User engagement and social interaction

A museum visit can be a transformative experience and new technologies can play a major role in the creation of such experiences, if used wisely. In order to achieve transformative experiences and at the same time encourage truly engaging activities, we should invent new ways to encourage visitors' critical thinking apart from simple physical interactions with multimedia tools (Stylianou-Lambert, 2010). Museum experiences also require a level of social interaction. Therefore, museums need "experiences that work well with multiple users, and provide points of social interaction" (Chan & Cope, 2015).

Particular note should be made to the concepts of interactivity and participation. Current trends focus on the stimulations of more “active, hands-on opportunities” that can “foster deeper knowledge acquisition” (Freeman et al., 2016, p.18). However, although these new forms of interactivity may enhance educational experiences, often they do so at the expect of other museum experiences: more introspective, personal or social ones. As Zheng et al (2015) argue, it would be useful to shift the focus from creating “hands-on” to “heart-on” interactive experiences (p.19).

A question that should be central to this discussion is: what does active engagement in a museum environment truly means? And under what circumstances can this active engagement lead to truly transformational experiences? Although technology can facilitate the provision of choice and personalization to the visitor, this does not necessarily mean that the visitor is “engaged in critical reflection” (Stylianou-Lambert, 2010, p.139). Thus, a visitor’s physical action does not guarantee critical reflection or meaningful engagement.

The way in which we approach the multimedia used in museums can also be re-conceptualised. As Witcomb (2010, p.36) suggests, if we think of multimedia applications as “objects” and as a “material form of expression”, it might be possible to think about multimedia displays in more innovative ways than a touch screen interactive. We argue that multimedia installations can be screen-less in order to avoid screen dependency and provide an escape from everyday world. They may also “engage emotions” and produce a different kind of knowledge—“one that embodies in a very material way, shared experiences, empathy and memory” (ibid). In essence, such multimedia installations can be considered something more than just “interpretive aids” but can also be seen as “creative art objects” (ibid, p.38) or, we may add “imagination aids”.

Conclusion

Obviously, it’s not constructive if technology is used for the sake of it or for the sake of innovation but it should be designed with the visitor in mind. Thus, the need to adopt a ‘user-centric’ approach, while keeping in mind the challenges of technology in museums, when developing new technologies for museum spaces is imperative. We argue that technological applications should be flexible, seamless, immersive, user-centric, and should promote social engagement, and critical thinking. Moreover, apart from their use in promoting knowledge, new technologies may also be seen as promoting imagination or collaboratively experiences. It can also be seen as a creative art objects: an object in itself. Finally, the designers of such applications should keep in mind that the museum audience is varied, and thus a user-centric design should take into account all different audience needs. All these points should be considered carefully during the implementation of new technologies.

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