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ENHANCING VISITOR EXPERIENCE IN MUSEUMS AND MONUMENTS THROUGH TECHNOLOGY: CONSUMER DEMAND

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Table of contents

Abstract

This thesis intends to analyze the use of technology in museums and monuments to strengthen the tourism experience, with emphasis on Portugal. Previous literature tackles this subject on a broad basis, an issue this thesis addresses. Hence, how can Turismo de Portugal enhance visitor experience in museums and monuments through technology? We advocate for Portugal's museums and monuments to explore the value of technology in today's world. By surveying related consumers, we demonstrate there is demand for technological enhancements within cultural spaces. The significance of this study is that it informs our theoretical understanding that visitors wish for technology in cultural sites.

Keywords

Tourism; Technology; Experience; Museums; Monuments; Consumer

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Introduction

Megatrends tend to last two decades, if not more, and have the power to transform people's habits globally. Technology is a notable example since digital evolution significantly changes the way people live, work and travel. In 2022, technology is present everywhere, even in simple and unexpected objects like toilets. This presence creates an expectation on the part of consumers in terms of technological advances in each industry, as many professionals have attested during our research. Technology as a supporting tool for museums and monuments has a positive impact on visitor experience due to its interactive nature and knowledge sharing capabilities.

Many managers have introduced new technological tools to revitalize the experience within their museum or monument to attract newer generations. Numerous studies have been conducted to determine the impact of the use of technology in museums and monuments, and the evidence indicates that it does in fact enhance the visitor's experience.

Interactivity is one of the main reasons for this enhancement as well as one of the aspects that drives cultural sites to adopt technology. Technologies such as Augmented Reality or tablets offering quizzes allow visitors to interact with the artwork while simultaneously being educated.

Nonetheless, interactivity is not the only benefit of technology in cultural sites. Nowadays, to avoid queuing for hours to enter a museum or monument, it is possible to buy tickets online which allows the website to manage attendance and entrance times simultaneously. This measure may seem trivial but is incredibly important because it is from this moment that a visitors' experience and satisfaction begin.

Technology also helps to popularize access to culture and knowledge. The Mona Lisa is a famous unfinished portrait of its time which regained popularity following its theft by an Italian, suspected of being Picasso or Apollinaire, who wanted to restore the painting to its country of

origin. This work of art is one of more than 480,000 owned by the Louvre, of which many were stolen by Napoleon during his military conquests and are displayed today to the public. Another fact is that he once called this art gallery his home before it became the largest and most visited museum in the world.

These facts show how essential museums and monuments are for collecting, preserving, and conveying years of history and cultural heritage. With the help of technology, cultural sites like the Louvre can readily deliver these facts to visitors through an audio guide, for example, where they can learn more based on their preferences. This information is also made available online for everyone's knowledge and to increase viewership. Sometimes people cannot visit museums due to financial concerns, medical reasons, or many other issues. Hence, technology enables museums and monuments to democratize cultural and historical knowledge to counteract the inequality in access to culture still present today.

The aim of this research is to highlight the significant role of technology in enhancing visitors' experience in museums and monuments by exploring professionals' and consumers' perception and experience with technology as well as the potential advantages and limitations of different technologies in this environment. In order to illustrate its importance, advantages and make recommendations to Turismo de Portugal, this paper focuses on the following research questions:

1. How can Turismo de Portugal enhance visitor experience in museums and monuments through technology?
2. Is there consumer demand for the use of technology in museums and monuments?
3. Which types of technologies are more desirable for consumers?

The scope of this study consists of a quantitative analysis with 84 participants aged 18 and up, collected by sharing the survey with our network and asking people in tourist areas, such as queues for museums. The volunteer recruitment process ended when three months passed to allow time for data analysis. To assess their opinion on technology in museums and monuments, each participant was required to answer a brief questionnaire.

This paper contributes to previous literature by addressing consumer demand for the use of technology in museums and monuments and specifically providing recommendations for Portugal.

Consumer demand

Traditionally, museums have taken a more classic approach and modeled their exhibitions around the artifacts being presented, usually with informative signage and no interaction. Today, consumers have shifted towards a more people-centered approach which keeps visitors engaged while also being educational and it is time for museums and monuments to follow suit. Technology can be used as a complementary tool for museums and monuments to facilitate an interactive and educational nature when site personnel are not available. The goal of this research focuses on whether or not incorporating relevant technology into cultural sites, such as Virtual Reality and Multimedia Guides, to improve overall visitor experience is something consumers want.

There is currently not much literature available concerning what museum and monument consumers wish for regarding technology when visiting such sites. However, many related studies have found there is increasing interest and benefits to incorporating technology in cultural spaces. The approach of this research consists of collecting information about enhancing cultural visitors' experiences with the use of technology directly from the consumers through a quantitative survey. To learn from cultural visitors rather than site managers is one of the main objectives of this study.

Another is which types of technologies are considered most useful and easy to use when exploring museums and monuments.

The structure of this paper is as follows, a literature review of relevant studies discussing the benefits of incorporating technology into cultural sites, followed by the study of consumer demand for technology in museums and monuments. This section will include the research questions, research design, selection of research participants, data collection and analysis, results, and finally conclude with limitations.

I. Literature Review

Museums and monuments have long been known as a great tool to educate and advance society through heritage and knowledge sharing, according to the International Council of Museums (2022). It is said that museums are a special place where education and leisure are intertwined (Recupero et al. 2019, 8). However, consumers are traditionally not part of the curation of exhibitions or related activities signifying that cultural sites are historically collection-centered and forget who their audience is (Recupero et al. 2019, 2). There is now a shift towards a more audience-centered approach which is in direct response to an increased lack of public funding and the need to compete with other leisure activities (Recupero et al. 2019, 1).

Here is where the use of technology becomes an integral conversation. Moving forward, the types of technologies considered for this paper and subsequent research are Virtual Reality, Augmented Reality, Multimedia Guides, Binaural/3D Audio, and Mobile Apps. Similar studies have been conducted where participants were asked to visit a museum in Rome that specifically used AR and VR technology. Visitors conveyed their desire to encounter the same experience in other cultural sites (Recupero et al. 2019, 5). This led the researchers to believe unusual and engaging experiences are typically those most remembered while on vacation. Further, when they

return home, there is the possibility of sharing their experience with others who then might visit on their own, resulting in word-of-mouth marketing.

In 2018, Sorenson, Jensen, and Hagedorn-Rasmussen (2018) wrote about how consumers today want personalized experiences in tourism. They follow what Recupero et al. (2019) remark about companies typically being more firm-centric. It is found that moving towards co-creation, customized products with personalized interactions, is the direction companies should strive for (Sorenson, Jensen, and Hagedorn-Rasmussen 2018). A common misconception from firms is they believe *they* can create value for consumers when it is really the opposite. Users themselves create value for a product or service when they are engaging in an experience which can only be produced based on their own perceptions, lived experiences, expectations, and more (Sorenson, Jensen, and Hagedorn-Rasmussen 2018). However, co-creation can be the bridge that leads to companies being able to influence consumers of their own perceived value (Sorenson, Jensen, and Hagedorn-Rasmussen 2018).

In terms of how museums and monuments can incorporate technology into their spaces, museum marketing may have an answer. Museum marketing is described as communicating information in an efficient way so the audience can properly process the information (Loncaric, Prodan, and Ribaric 2016, 3). However, this type of marketing does depend on the country of origin and what the museum offers. There are four key aspects of museum marketing to consider: the development of a museum, how it will be financed, what the competitive environment is, and getting to know the visitors better (Loncaric, Prodan, and Ribaric 2016, 3).

Loncaric, Prodan and Ribaric (2016) studied the correlations between a well-designed website and actual visits to museums based on a shift towards a people-based display of culture with communication and away from the classic display. Sometimes websites are a person's first

impression of a cultural site which means they need to stand out. Well-designed websites are found to have positive correlation with attracting potential and existing visitors to physically set foot in the museum due to their efficient delivery of information and trust gained around the quality of their exhibits and displays (Loncaric, Prodan, and Ribaric 2016, 5). Their research provides a guideline for museum managers about what consumers are looking for as part of their overall experience.

While this may sound like a great idea, it is no small feat. Budgetary constraints are often the reason cultural sites lack a website that wows consumers. The four biggest complaints from consumers are found to be lack of access to a museum's full content, not being able to find what they were looking for (e.g., location, art on display), not finding a museum's hours, and not being able to chat with curators (Loncaric, Prodan, and Ribaric 2016, 4). These are important findings because they ask visitors directly what they are looking for when they decide to enter a tourist space, which correlates with the research presented in this paper. It also provides insight into what consumers find most important when they consider visiting a museum or monument.

Technology can be used as a great tool to replicate humans when personnel are not available (Perdue, Stoinski, and Maple 2012, 3) as most can agree having a live guide is preferable. To further the idea that museums are an education center which need to shift from focusing on the object to the subject being presented (Nizar and Rahmat 2018, 1), one Atlanta Zoo studied the effects of technology when presenting their visitors with information about their exhibits. Researchers found that visitors remembered more of the information presented to them in a video format than they did when it was presented on traditional signage (Perdue, Stoinski, and Maple 2012, 9).

Another zoo in the United States corroborated this idea that when live presentations cannot be made available, traditional signage does not deliver as well as interactive technology (Mony and Heimlich 2008). They found that people prefer to have the opportunity to ask questions and immediately receive responses which technology can resemble. While their research found that human interaction will always supersede other forms of information channels because people place greater value on human interaction, interactive technology can help bridge that gap (Mony and Heimlich 2008).

Going along with the theme of moving away from solely looking at artifacts, Tobiassen, Taxen, and Bowers (2000) find that visitors might want the chance to be more hands-on with the display. A notable example of this is the Opera del Duomo Museum in Florence, Italy. They have developed replicas they call TouchAble which allow tourists to touch the art they see in display cases or behind barriers. This method was developed in response to accessibility reasons (i.e., visual impairments) but can be a wonderful way to engage young children who are naturally keen to touch everything or who may not be able to read yet (Tobiassen, Taxen, and Bowers 2000, 4).

How accustomed a person is to technology does play a significant role in their adoption rates of recent technological advancements, especially in museum and monument environments. Their familiarity can drive their attitude towards newly emerging tech and related activities or tasks. Innovativeness, a term coined by Everett Rogers (1995), is how fast a person adopts an innovation before others. This is broken down into five distinct categories: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards (Rogers 1995).

Researchers Kang and Gretzel (2012) studied the effects of podcasts in a museum space using the Technology Acceptance Model. This model was created by Fred Davis (1989) to emphasize the perceptions of a potential consumer measured by perceived usefulness (PU) and perceived ease

of use (PEU). Figure 1 below shows a quick outline of the technology use pipeline which the model presents. If a consumer does not believe the technology is either useful or easy to use, they simply will not use it (Recker 2015). It is important to note that younger generations and those who use apps every day (outside of tourism) find usefulness especially important (Swart, Sotiriadis and Engelbrecht 2019, 3). The model does not explain much about the technology itself but what a person believes or perceives the technology to be (Recker 2015). However, there are some limitations to this model. It assumes people are rational decision makers and rational in their behaviors meaning they develop a plan to use the technology then follow through with it (Recker 2015). Although not everything has a plan or reason beforehand. A second limitation of this model is that it does not explain how to make technology useful or easy to use (Recker 2015).

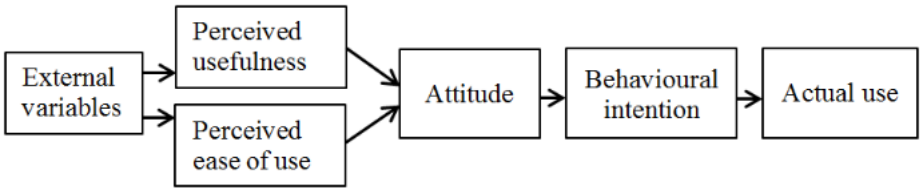

Figure 1: Technology Acceptance Model

Kang and Gretzel's (2012) results regarding perceived usefulness and perceived ease of use are interesting. First, they emphasize that internet familiarity is a crucial role in how a person perceives the use of technology in environments such as museums and monuments (Kang and Gretzel 2012). They believe cultural sites should consider the general attitude of tourists toward and experience with technologies when understanding how to implement them into tourism spaces. More than half of their respondents said they prefer using a rented device from the museum than their own for recorded content (Kang and Gretzel 2012). This is likely due to lack of device storage, Wi-Fi capabilities or more complementary issues.

Another study which uses the widely accepted TAM approach to evaluate their intentions is one conducted during a business event/exhibition. Swart, Sotiriadis and Engelbrecht (2019) pushed for the event to use a mobile app to study the perceived usefulness (PU) and perceived ease of use (PEU). Despite a person's perceived expertise, perceived usefulness was found to have both direct and indirect effects on tourist's intentions to use the app, one being that tourists' attitudes do play a role in whether they will actually use it (Swart, Sotiriadis, and Engelbrecht 2019, 3). The researchers suggest putting the consumer first by making the technology benefit the tourist and not the provider in order to influence them because they found, overall, consumers like technology in their tourism experiences (Swart, Sotiriadis, and Engelbrecht 2019, 4).

To further this discussion, they suggest that the use of mobile technology in the tourism industry could provide more opportunities for businesses to capture the attention of targeted markets and start to build loyalty because they found that the more people use apps, the more they will want them in their tourism experiences (Swart, Sotiriadis and Engelbrecht 2019, 3). Mobile technology should be built with convenience and added value in mind. This means apps need to be efficient, enticing, informative, interactive, and offer services that are effective (Swart, Sotiriadis and Engelbrecht 2019, 4).

II. Aim and Research Question

The aim of this research is to better understand the consumer point of view regarding visitor experience to museums and monuments. A main focal point being their perception of the use of technology in tourist spaces as it is not studied enough in related analyses. Again, technologies discussed in this research are Virtual Reality, Augmented Reality, Multimedia Guides, Binaural/3D Audio, and Mobile Apps. Therefore, this study intends to answer the following research questions:

1. Is there consumer demand for the use of technology in museums and monuments?

2. Which types of technologies are more desirable for consumers?

III. Research Design

It was imperative for the research design to incorporate perceived usefulness and perceived ease of use as it is a principal factor for museums and monuments to consider when they decide which technologies to use. Therefore, a quantitative survey was created which includes 29 multiple choice questions, some of which use the 5-point Likert scale. This scale is used to directly measure attitudes providing five viable options which specify how strongly a respondent feels about the question, usually ranging from Strongly Agree as one to Strongly Disagree as five (McLeod 2019).

The questionnaire begins with simple demographic questions such as gender, age, and nationality. It was crucial to obtain various backgrounds for this research to gain a broader perspective into the global desires of museum and monument consumers. Further questions were designed to better understand how respondents feel towards the idea of adding technologies into more of their tourism environments. Therefore, questions about their level of comfort with technology and how often they visit museums were asked. Then, questions involving downloading apps on personal mobile devices were employed. Finally, sections of questions about the use of specific technologies were utilized to assess participants' attitudes.

IV. Selection of Research Participants

The objective was to find ordinary tourists who visit or have visited museums and monuments to gain perspective on their opinion of technology in cultural sites. This means it was important for many nationalities to participate leading to the questionnaire being sent to our diverse network

of personal and professional relationships through various communications, such as email and LinkedIn. Most participants include friends, family and colleagues who were then asked to share with their own networks for more diversity.

V. Data Collection and Analysis

The survey was conducted via Google Forms for participants' ease of use with a final collection of 81 participants. All results are stored anonymously to ensure privacy and full transparency in respondents' answers. Analysis of the data included examining how many participants already have a background with technology, whether it is based on their age or not, and which technologies presented were more appealing for museum and monument settings in the future. The technologies were listed in order as Virtual Reality, Augmented Reality, Binaural/3D Audio, Multimedia Guides, and Mobile Apps. Participants were also provided with a brief description when asked about a technology's future use in cultural sites, in cases where they did not have prior knowledge.

VI. Results

Participants answered from a total of thirteen countries with the majority identifying as female (59.5%). Close to half (48.8%) of respondents identified as being between the ages of 18 to 25 years old. This information could account for many of the responses being receptive to the use of technology in more tourism spaces because younger generations tend to be more accustomed to using and trying modern technologies. The rest of the respondents' ages range from 26 years old to older than 75, our last option. It is beneficial to receive answers from groups known to be slow to adopt innovative technology in order to be conscious of their perspective on the matter and hopefully influence museums and monuments to consider their skill sets as well.

When asked if participants think technology is essential in today's society, the results are overwhelmingly in agreement. On a five-point scale, 61.9% Strongly Agree while 34.5% Agree that technology plays an immense role in our everyday lives. To confirm most participants have experience visiting museums and monuments, 71.4% say they usually visit. Which leads to the next question about their overall enjoyment where 63.1% say they have Good experiences and 28.6% say Very Good. To ensure respondents have general knowledge of technology outside of cultural spaces, they were asked how often they use technology in their everyday lives. 88% say they use it Very Much while 10.8% say Somewhat. This informs the research that our respondents generally have an understanding of technology before entering tourist areas and may answer the perceived ease of use question.

Following this, the survey asks if participants think museums and monuments should implement technology into their experience where 88.1% agreed. When asked their opinion on the extent to which technology is important in museums and monuments, the results are somewhat surprising. On a scale of Very Important to Very Unnecessary, 63.1% said it is Important, meanwhile 16.7% said it is Very Important and 17.9% said technology is Unnecessary. The next question asked is about the extent to which innovative technology will contribute to the enhancement of visitors' journeys. This is presented as a scale of five options ranging from Not at All (one) to Highly Contribute (five). Most respondents chose between four (35.7%) and five (32.1%).

The next question presented a set list of options for how participants think technology will improve their visitor experience. The majority of responses point to Easy Booking (75.9%), Avoiding Lines (62.7%) and Digital Tour Guides (57.8%). It is important to note here that there was a possibility to choose multiple answers. The results of this question point towards the phenomenon of constantly making all avenues of life more efficient. As an introduction into the

next set of questions about specific technologies, it was prudent to ask respondents of their opinion regarding the importance of providing free Wi-Fi in museums and monuments. Subsequently, 65.5% agreed it is a key aspect of implementing technology.

The remainder of the survey is split into five separate sections according to the corresponding technologies of this research. In the section concerning Virtual Reality, participants were asked about their prior knowledge of the technology where 90.5% said Yes. On a five-point scale, from Strongly Agree to Strongly Disagree, 47.6% of participants Agree that it is appropriate for a museum to use this type of technology while exactly 50% of participants Agree VR is appropriate for monuments. It is interesting and surprising to observe a slightly higher agreement to monuments over museums.

Next, there is a section of questions about Augmented Reality. These were identical to VR in that they ask participants about their expertise and appropriateness in museums and monuments, respectively. Out of the 84 responses, 63 say that they do know of AR, accounting for 75% of the results. In museums, almost half (46.4%) Agree that AR is appropriate while 29.8% Strongly Agree and 21.4% have No Opinion on the matter. This is a much larger number of neutral answers than the research anticipated but is important no less. For monuments, there is a greater difference of opinion presented. 45.2% Agree with the use of AR while 23.8% Strongly Agree and 22.6% hold No Opinion.

Binaural/3D Audio is a technology that the research thought few were familiar with, resulting in speculation that participants would be wary to answer this set of questions. Hence, 52.4% say Yes, they have heard of BA before leaving the remaining 47.6% to say No, which was to be expected. For the appropriate use of BA in a museum, 45.2% Agree while 28.6% have No Opinion and 26.2% Strongly Agree. In monuments, there is a slight variation to previous

technologies as one respondent Disagrees with the use of BA. However, the majority Agree (41.7%), have No Opinion (32.1%), or Strongly Agree (25%) that Binaural/3D Audio would be an appropriate use.

In the case of Multimedia Guides, the questions are the same but offer different insights. 89.3% of participants say they have previous knowledge of MMG. Perhaps due to the fact Multimedia Guides have been utilized in museums and monuments for decades and are a more familiar technology for tourists. Questioned about whether MMG are appropriate for a museum to use, participants overwhelmingly answer with Strongly Agree (44%) and Agree (44%). For the use of MMG in monuments, 45.2% Agree while 40.5% Strongly Agree. Intriguingly, 13.1% report having No Opinion.

Finally, respondents were asked about their opinions on the use of Mobile Apps. First, they report having a smartphone (97.6%) being able to easily download apps (92.9%). The thought behind asking if participants can easily download apps is a consequence of little available storage reported among smartphone users in general. It is a common complaint when visitors are asked to download material to their own mobile devices to fully take part in the experience. The next question asked how often respondents download apps. 33.7% say they download Often, 31.3% say Somewhat and 20.5% say Rarely. The final two questions asked about their perception towards downloading a museum or monument's app if they provided free Wi-Fi or not. 60.7% say Yes, they would if free Wi-Fi was provided which drops to 40.5% when free Wi-Fi is not provided.

VII. Limitations

It is important to note that multiple choice questions have been found to skew results because there is a fixed set of answers presented which may not fully reflect the opinions of respondents. In addition, the results of the questionnaire could be biased due to our contacts

consisting mostly of friends and family. Due to the use of Google Forms, there is no possibility of cross-referencing results, for example, by age and use of technology. This is considered a disadvantage and calls for further research as it would be beneficial to be aware of any surprising results.

Conclusion and Recommendations

Due to its interactive nature and educational capabilities, technology used as a supporting tool for cultural sites has a significantly positive effect on visitor experience. From augmented reality to tablets with interactive quizzes, sight, hearing, emotions, and reflection are stimulated by technologies thus enhancing visitors' experience.

In today's modern world, technology is part of our daily lives driving consumers' expectations in terms of technological development and homogeneity across industries. Accordingly, our worldwide quantitative survey confirms this claim. Much of the public is looking for efficiency and convenience in every aspect of their life, including cultural sites. The questionnaire finds that despite age and difference of culture, technological innovations have affected the way we interact with the world. Tourists want an easy but useful experience while they are visiting a museum or monument and they attribute technology to being the answer.

To respond to consumer demand and stray from being outdated, which could change people's perceptions of museums and monuments, investing in new experiences could be a wise decision from cultural sites, especially for younger generations. The results of this study demonstrate that for consumers, technology is essential and drives interactivity, knowledge, and curiosity. It also promotes activity and new experiences, as well as new business models which allow sites to reach new audiences. Since the introduction of technological tools has established a

positive experience, many tourism professionals are developing new projects involving new expansions or tools. Like any project, it is essential that museums, monuments, or Turismo de Portugal keep in mind their agenda, objectives, and challenges to further implement an appropriate technology that will share their content while holding the capacity to finance and maintain it.

Following the analysis, a list of recommendations to consider is addressed to Turismo de Portugal for their tourism policy agenda.

This first recommendation may seem trivial; however, research has indicated that many museums overlook this crucial aspect. Before choosing a specific type of technology, it is important for the museum to know what message they want to transmit, what their values are, why they want to use technology, who their visitors are, and what their expectations are. Conducting a visitor survey could be a potential first solution.

To address financial concerns and present the second recommendation, this paper suggests partnering with tech companies, start-ups or universities specialized in technology as a conceivable way to reduce costs and provide experience to innovative individuals. For instance, tech start-ups may appreciate the opportunity to test their products in museums and monuments in order to adjust certain settings, features and identify potential improvements, provided the technology is well accepted by visitors. Thus, this allows the cultural site to test the tool before purchasing and implementing it into their exhibitions.

Finally, we would like to recommend that Turismo de Portugal should develop a web-app which collects all the relevant information from museums and monuments in Portugal a tourist could need. This idea has many advantages, the first being visitor access to all necessary information, such as location hours and ticket prices. Another advantage enables guided tours on a single application without the need to download an app for each site, especially when users have

limited mobile device storage. A web-app allows cultural sites that do not have the means to finance their own application a technological tool resulting in not being left behind. However, with the use of a web-app, Wi-Fi should be made readily available with quality service to handle the appropriate number of users at a given time.

This study contributes to previous literature by giving a voice to consumers to express their opinions and experiences of using technology in a cultural environment. This research adds more discussion and insight into what consumers want when they go to museums, what they consider should be utilized, and how they should be implemented. The survey specifically asks consumers from around the world what they desire, which corroborates what museums have been doing for some time now by shifting from art-centered to people-centered exhibits where the consumer determines the value they receive from the museum and not the other way around.

Nonetheless, this survey and the paper have limitations. Indeed, the survey sample is small and does not significantly represent visitors worldwide. Proposing a list of answers through a multiple-choice system may skew the answers since there are a set of options to choose from with no possibility of free space for thinking.

For future research, it would be imperative to survey a larger number of global participants to gain knowledge about their experiences in museums and monuments today compared to their future expectations and desires.

When mentioning art and museums, Portugal is not the first country most tourists think about. Despite Portugal having centuries of history, the country is not usually a main reference to art and culture which people cite. However, this affirmation could become inaccurate with the implementation of technology. By investing in this venture, Turismo de Portugal could change the course of history and attract more tourists, one of their main objectives.

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