

Conceptual Model of a Mobile Application for Educational Purposes to Help Preserve the Country's Historical Heritage and Promote the Cultural Identity of the Nation

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Abstract. The increase of smartphones with Internet access has been a steady trend over the last 10 years and already represents a solid infrastructure that can be easily used for educational purposes. The creation of a mobile application in the field of cultural heritage can be a valuable aid for the dissemination of cultural and historical data.

Keywords: Mobile Penetration, Cultural Heritage, Digital Technology, Smartphone, Historical Memory

1 Introduction

The use of mobile applications for various purposes is constantly increasing worldwide. Every day we use digital devices, and the smartphone is the most widespread mainly because of its compactness and capability to support multiple applications. The increased opportunities for spectrum utilization, on the other hand, make it relatively cheap to use the internet wirelessly via up-to-date mobile technologies (WiFi, 4 & 5G etc.), and thus every citizen is connected to the global network. Finally, the rapid penetration of cloud services, provoked by the market trends (e-commerce, social networks, etc.), creates habits for people to use mobile devices for various purposes. Based on the above, we can conclude that the mobile infrastructure can be easily adapted to any Internet application, including educational – m-learning (Draganov, et al., 2015). It is hard to point out even one area of the economy that has not been changed as a result of the digitization, and given the potential of the information and communication technologies (ICT) to create entirely new niche markets and businesses, the number of sectors, that are directly dependent on them, will continue to grow. Considering the need to preserve the nation's knowledge of our cultural and historical heritage, an idea with a long-term potential would be the creation of a mobile application with information about various cultural attractions, historical data, maps of historical sites, etc., facilitating the development of the cultural literacy nationwide.

2 Dissemination of Digital Technologies and Their Role in the Social Development

The digitalization directly affects the labor market through the constant pressure for higher qualification of employees, but it also has a significant impact on the way we spend our free time, go on holiday or just have fun. One of the most important features of the digital ecosystem however, is that the objects inside are constantly interacting, and these interactions may result in an entirely new functionality that in turn contributes to a further development. For example, if we have a database of the nature attractions and connect it with a suitable GPS application, use a database of the available hotels, and also a timetable of the public transport, we can easily make a plan to visit these locations, or even - to delegate this task to a suitable web application with artificial intelligence elements (Kouzov, 2018). The penetration of digital devices into our everyday life is linked to this variety of opportunities and, at the same time, is an essential factor for their further development, since these devices build the infrastructure, upon which new information services can be successfully disseminated.

3 The Importance of the Cultural and Historical Heritage in a Knowledge-Based Economy

We usually judge about events from the past only from the historical texts or rumors heard by others - we learn the history by the engraved letters in a stone, from the preserved manuscripts, or from myths, handed over from generation to generation. In this aspect, the more authentic artifacts and sources we have available, the more realistic and historically true will be the picture that we get. These could be architectural monuments, sculptures, frescoes, icons - to consider and feel our connection to the past, every touch with our cultural heritage could help us better understand the history, critically reflecting our previous knowledge, or change our attitude if needed.

In today's knowledge-based economy, the accurate information is paramount. Very often the motivation of our actions or the basis of our success are found in the lessons from the past, so the more we know, the fewer mistakes we would make in the future. People, who do not have a rational historical memory, can be easily manipulated by other cultures that have gained a greater global influence and, in pursuing some ad-hock popularity, are ready to abandon their authentic appearance and thinking only to "look better" on facebook. Our historical culture is not only an archaeological term, it has an influence on our way of life, our appreciation of the world, and our values.

3.1 ICT Usage for Preservation and Promotion of Cultural Monuments

If a nation wants to preserve its authenticity, philosophy and culture in the conditions of the global economy, it simply has to make sure that they will have their realistic

online presentation. For example, it is obvious that within the framework of a human life it is hard to visit all the cultural or historical monuments, relevant to our national historic memory, while at the same time a large part of them can be digitized and made accessible through a web browser or a smartphone application. The technologies are constantly evolving and devices such as 3D scanners and printers are already a reality, so many of the ancient culture artefacts can be digitized to an extent good enough to restore a destroyed building from its digital copy. Such technology will be used to restore the world-famous Notre Dame cathedral, which has recently suffered from an accidental fire. Similar attempts are already made, for example, with some statues (Fig. 1), as over time many of them have lost parts of their bodies, and restorers can only focus on the remaining fragments (Saber Point, 2013).

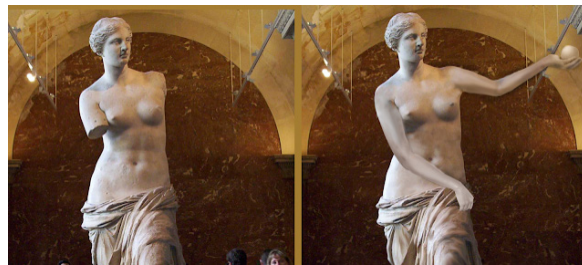


Fig. 1. Photoshop reconstruction of Venus de Milo

To sum up, the opportunities of the technologies for preserving and promoting our cultural and historical heritage are huge and are constantly increasing. The world is actively embracing the digital reality and, since all the information of the universe can be transposed into 0 and 1, so no wonder if, in the near future, everything needed to restore an object, regardless of its complexity, could be uploaded on a flashdrive and the digital memory of the world be able to survive even when the humanity is gone.

3.2 The Cultural and Historical Heritage and the Young People

The lack of historical memory is a particularly serious problem for the young people. Unfortunately, with the technology advance, our society is becoming more lazy, most information, that teenagers are searching, is on the Internet, so they rarely have to enter a library or museum, and do the research themselves. At the end, most information reaches them not from the source, but changed in one form or another, and this can sometimes cause lasting harm. It is logical that young people use digital technology quite a lot. US statistics, for example, shows that 94% of the users between 18 and 29 years use a smartphone, with the age this % is decreasing to fall to just 46% for the retirement consumers. Apart from that, they also spent more time online, as shown below (Fig. 2). Obviously, this statistics suggests that in order to engage young people, we need to take advantage of their interests and habits. For instance, if it is important to focus them on cultural and historical objects, knowing that the smartphone keeps such an important place in their value chain system, we can simply find appropriate

resources on the web, provoke our kids to look and discuss, and after we have intrigued them enough, give them some additional links to follow alone.

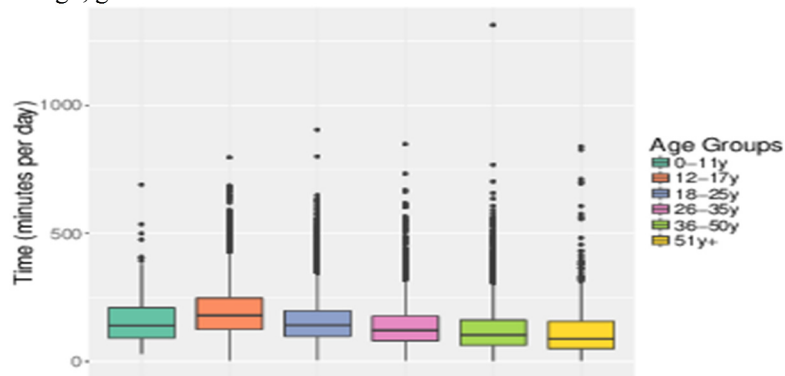


Fig.2. Smartphone usage by age group (Research Gate, 2016)

3.3 Cultural Heritage Content to Raise the Educational Level of the Nation

A specially designed mobile application for cultural heritage will not target just young people but can become a nationally representative effort to preserve and enrich our historical memory. Ultimately, even professional artisans do not know everything, so if we gather information on all major cultural sites in a common database and create a mechanism for its ongoing update and development, it is quite possible that the whole society will stand behind the endeavor, making it a comprehensive portal, dedicated to cultural and historical heritage. This portal can be a handbook for students, serving the media, businesses and citizens, be a major tourist guide (the application will be multi-lingual) and serve also experts, as the information, they need, will be arranged in a professional manner. At the same time, they will be able to supplement the data and the effect of the application will contribute to raising the educational level of the whole society and the knowledge of the citizens about their history and cultural heritage.

4 Specifics of the Projected Mobile Application

It is most logical that such an application be built, following a modular principle and developed at stages, the leading organization may be public or private, but at some point the official state authority must necessarily recognize it because there are number of cultural objects in Bulgaria (in museums, galleries, etc.), to which the access is limited without a proper authorization. This will be especially important as, on the long run, the effort could be combined with similar international educational initiatives like Open Discovery Space project (Peinado, et al., 2015), so a national recognition is a must.

4.1 Conceptual Model

Let's look at a conceptual model (Fig. 3) of a mobile application, devoted to the cultural heritage. We consider a cloud environment with an open architecture that can be upgraded with additional functionalities and linked to external databases. The model should provide opportunities for further development, including web services and data exchange with other systems. Let's briefly describe the individual modular elements.

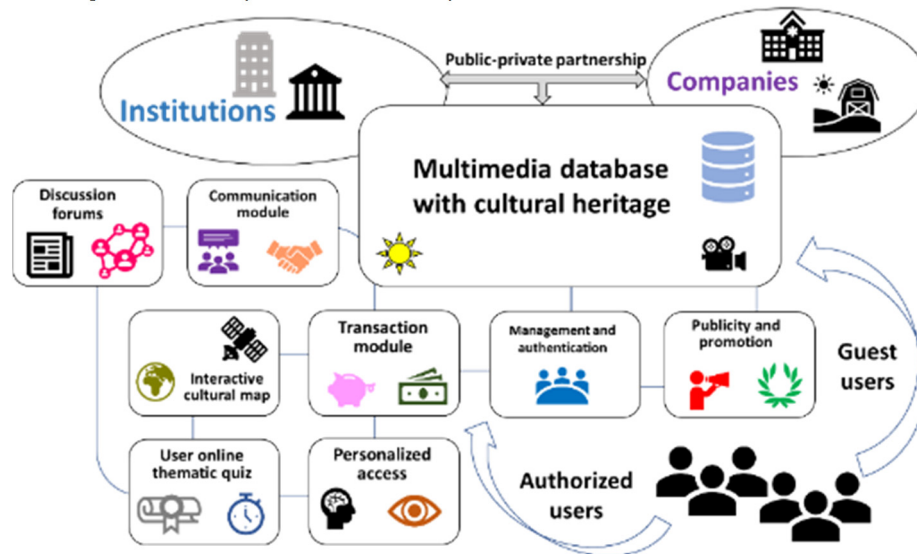


Fig.3. Conceptual model of cultural heritage mobile application

- **Multimedia database** – a digital archive of museums and galleries. All objects will automatically receive a unique identifier in the system, as well as a QR code, which is becoming a common practice in gallery business (Kaposi, et al., 2013).
- **Management and authentication module** – comprises rights and access levels of the individual users, as well as the ability to authenticate through a social network account. Users should be able to sign up alone and extension of rights – enabled later.
- **Transaction Module** – will allow the museums and galleries to sell tickets for their exposures or souvenirs online as well as the users to combine different discounts, use subscription cards, make virtual selfies with the exhibits as a background, and so on.
- **Personalized Access Module** – each user will be able to completely change the look and content of his home screen – get his favorite collections, assign ratings to individual sights or organizations, add personal comments and opinions etc.
- **Communication module** – a built-in interface for mail, chat, audio and videoconference (most likely – an integration with an existing audio/video application).
- **Module for promotion and publicity** – a detailed information about the programs of the individual sites, news, interesting facts, etc., updated by the stakeholders.

- **Forums dedicated to cultural and historical heritage** – different users will be able to exchange information about the sites they have visited, with moderated access.
- **Interactive maps of cultural and historical sites** – the system will "prompt" the users in case there are suitable cultural sights in the area (GPS location tracked).
- **User quiz** – thousands of questions in the field of cultural and historical heritage with different regimes (including online time competitions, team play etc.), which will encourage many people, especially from the younger generation to participate actively.

4.2 Development Guidelines

Over time, the application can be develop in several directions both in terms of content (for example, adding 3D models for those items that allow such, so that any user with a 3D printer can reproduce them), as well as in functionally, such as cultural tourism - the application will be multilingual, adapted to people with disabilities and will be able to make connections with other systems, related to hotel booking, tour guides, ticket purchase, and so on. However, the main advantage will be the ability to get additional information (text, audio, and video) about the landmark in a friendly and unobtrusive manner in order to feel the cultural spirit and understand the historical life of the nation.

5 Conclusions

The availability of smartphones with Internet access is a serious opportunity to convey important messages and engage larger groups of people with a common cause, building on the mobile infrastructure. Given the natural life cycle of the cultural objects and the need of citizens to periodically recall history and enhance cultural heritage knowledge, we suggest a model for a mobile application that facilitates and channelizes the process. Various stakeholders - institutions, companies, academic circles, or simply responsible citizens - will be attracted and the system can be of great educational significance for the preservation of the nation's memory and cultural heritage values.

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