Dušan Tatić
Mathematical Institute of SASA, Belgrade
Marko Jovanović , Jovan Stojanović
ARhiMedia group, Faculty of Electronic Engineering, University of Niš
Radomir S. Stanković
Mathematical Institute of SASA, Belgrade

APPLICATION OF INFORMATION TECHNOLOGIES IN PRESENTATION OF FIRST WORLD WAR DIARIES

Abstract. Due to advancements of information technologies and ubiquity of mobile devices, various applications and presentations are continuously developing in order to keep an individual properly informed about a wide diversity of topics. Applications of a specific type are dedicated to the presentation of historical heritage in order to better inform and immerse users into historical happenings. In this context, war diaries are viewed as precious documents since provide authentic information by persons directly participating in certain events. Besides historical facts, diaries offer personal interpretation of events and circumstances within which they have happen. Therefore, preservation of war diaries and their presentation to a wide audience is an important task in digitization of national historical heritage. This paper presents such applications for a multimedia presentation over mobile devices of two First World War diaries by the general Dušan Dodić and the soldier Stojan J.Jeftić. The applications are based on the corresponding books and related exhibitions at the Regional Museum Jagodina and the Homeland Museum of Knjaževac authored by Duško Grbović and Milena Milišević Micić, respectively.

Keywords. Information technologies, mobile applications, war diaries, historical heritage

1. Introduction

Information technologies have been used in each segment of everyday life of a contemporary individual. In particular, a large amount of information is gathered through mobile devices such as smartphones or tablet PCs. Therefore, advancement of mobile technologies and mobile applications tends to provide sophisticated data according to the user needs.

Presentation of information in a visually attractive multimedia content about the historical heritage is a particular field of applications of mobile technologies. Development of applications for presentation of historical heritage on mobile devices necessary implies conversion of historical material preserved in written or possibly other forms into digital data.

This procedure contributes to preserving of historical data and at the same time provides foundations for developing mobile applications by using these data. Such applications can serve needs and fulfill expectations of museums visitors for attractive and immersive exhibitions. They however can also be used in educational purposes in whatever formal school based education or personal learning according to individual interests.

Consequently, museums and archeological sites are trying to make exhibition enriched by the usage of modern technologies. The technologies applied are differentiated by the type of the exhibitions [1, 2]. For instance, projection systems tend

to give multimedia information projected on the surface at the exhibition place [3, 4]. Further, projected image can be generated by special designed multimedia devices that are used to enrich the part of presentation at the exhibition [5, 6]. Otherwise, mobile application presents cultural heritage in form of electronic guides that suits mobile device of visitor [7]. Mobile solutions vary by type of technologies applied such virtual reality that can immerse visitor in the past [8]. Furthermore, augmented reality technology can be used for applications that can combine real world image with virtual object while guiding the visitor on the cultural heritage via mobile device [9]. Sensor based application can use Bluetooth of a mobile device to locate the user with beacons at museum space and provide more information about nearby museum items [10]. Also, Quick Response (QR) codes can be attached to monuments and recognized by the camera of the mobile device to enhance tourist experience with additional information [11].

In this paper we present the usage of mobile technology to create a platform in order to enrich the presentation of war diaries from the First World War. We first discuss the technologies applied to create specific modules of required for such mobile applications. Then, we present two particular applications presenting two diaries from the First World War. These are diaries of the Serbian army general Dušan Dodić and an ordinary soldier Stojan J. Jeftić.

2. Technologies

Electronic version of a war diary is realized as a mobile application that can be installed on a mobile device of any person interested in this historical topic. The Unity engine is used as a cross platform tool that can build application for different mobile platforms such as Android or iOS. Different modules are embedded to show various historical material taken from a diary. Each module is a scene defined trough an XML file for dynamical adaptation of different historical material. Every module has the header and the footer. Header is defined with two buttons left and right while in the middle is provided a place for textual data. The left button is usually used as back or exit action, right can be used to link to other modules while text is often the title. Footer provides place for five buttons which actions load other modules. The application is organized as follows.

Main menu presents the main application screen where particular chapters of a diary are related to icons presented in form of buttons. Each button provides action that opens a new module according to the historical content to be presented.

List module is a set of historical content elements positioned in a scrollable list. Elements of list are classified as captions that belongs to specific historical group. Each element consists of an image and its title. Also, each element is interactive and it is link to the Info module where additional multimedia information is provided. Alternatively, it can be linked with the Gallery module usually aimed at showing old historical photos.

Info module is created with the aim to show textual content explaining some of the historical facts about the chosen topic. Also, this module has adaptation of photos through a thumbnail slide gallery. This thumbnail slide gallery is interactive and by selecting one thumbnail, the Gallery module is activated and the image is shown in a larger size. Also, thumbnails with caption can be positioned between paragraphs. Accordingly, interactivity is implemented so that when a thumbnail is chosen, it can be viewed in the Gallery module.

Gallery module is prepared for handling digitized historical photos. Gestures pinch to zoom and swipe to change the current image with another image in the image gallery are implemented. In the header of the gallery element, a text field is used for the image description. In the footer of the image gallery, there are buttons for changing the image on the screen forward and backward. Also, buttons that zoom in and zoom out the image are implemented.

Map module is embedded as the geographical map with implemented Google map services. Markers on the map are provided and defined in the XML with their longitude, latitude, and description. Each marker presents a place of an important historical spot. Markers are interactive and provide the textual information or some embedded action like linking to the other module.

3. War diaries

Two First World War diaries are made by using the above described mobile application, which is especially designed for presenting this type of historical digitized content.

3.1. War diary of Dušan Dodić. In this section, we present the war diary of the general Dušan Dodić one of the heroes of the Serbian army during First World War. He commanded the Cavalry division at the time of Thessaloniki front and made valuable records during this period. The diary was given by his family member Veljko Milutinović to the Regional Museum Jagodina where digitization of historical material was done. Digitized material was provided to the ARhiMedia group which created mobile applications for Android and iOS platforms. The links to download the application are provided through QR code on the poster in Figure 1.

Figure 1. Poster for the application War diary of Dusan Dodic

Main screen given in Figure 2 presents the titles of prime topics of this war diary application. The topics are about Dušan Dodić, War Diary Handwriting, War Diary Content, About War Diary, Publications, Family Memories, and Jagodina in the Great War presenting a short description of the situation in Jagodina during the Great War prepared by Duško Grbović.
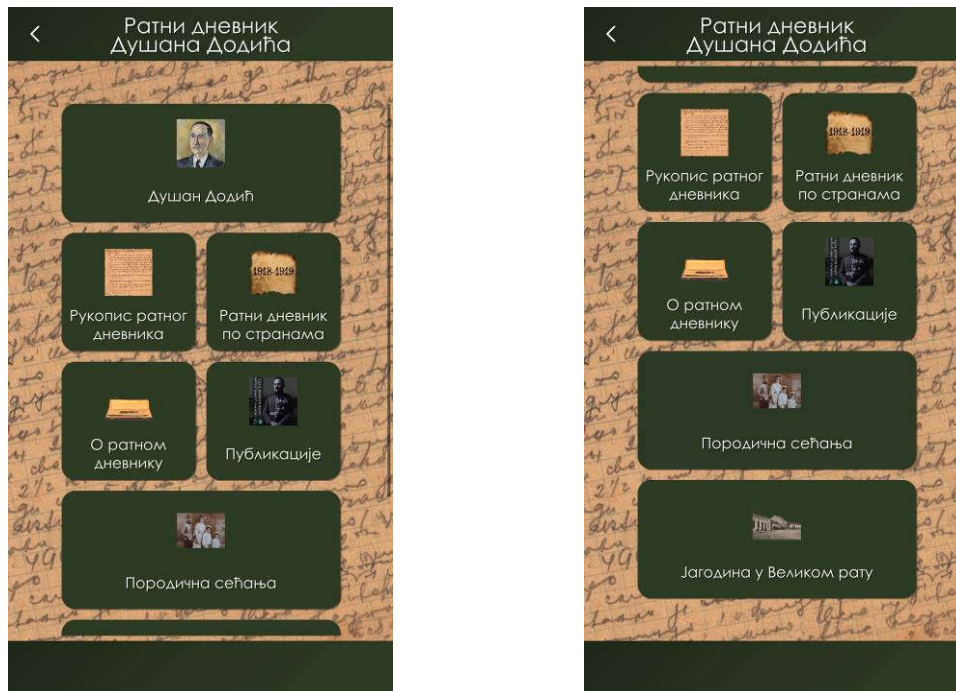

Figure 2. Main screen of application

Topic about Dušan Dodić (Figure 3) categorized in a List module ordered by titles Origin, School, Family, Military Career, First World War, Decorations, Emigration, and some Additional material. Each of the topics are link to the Info module where the text and digitized photos are provided.
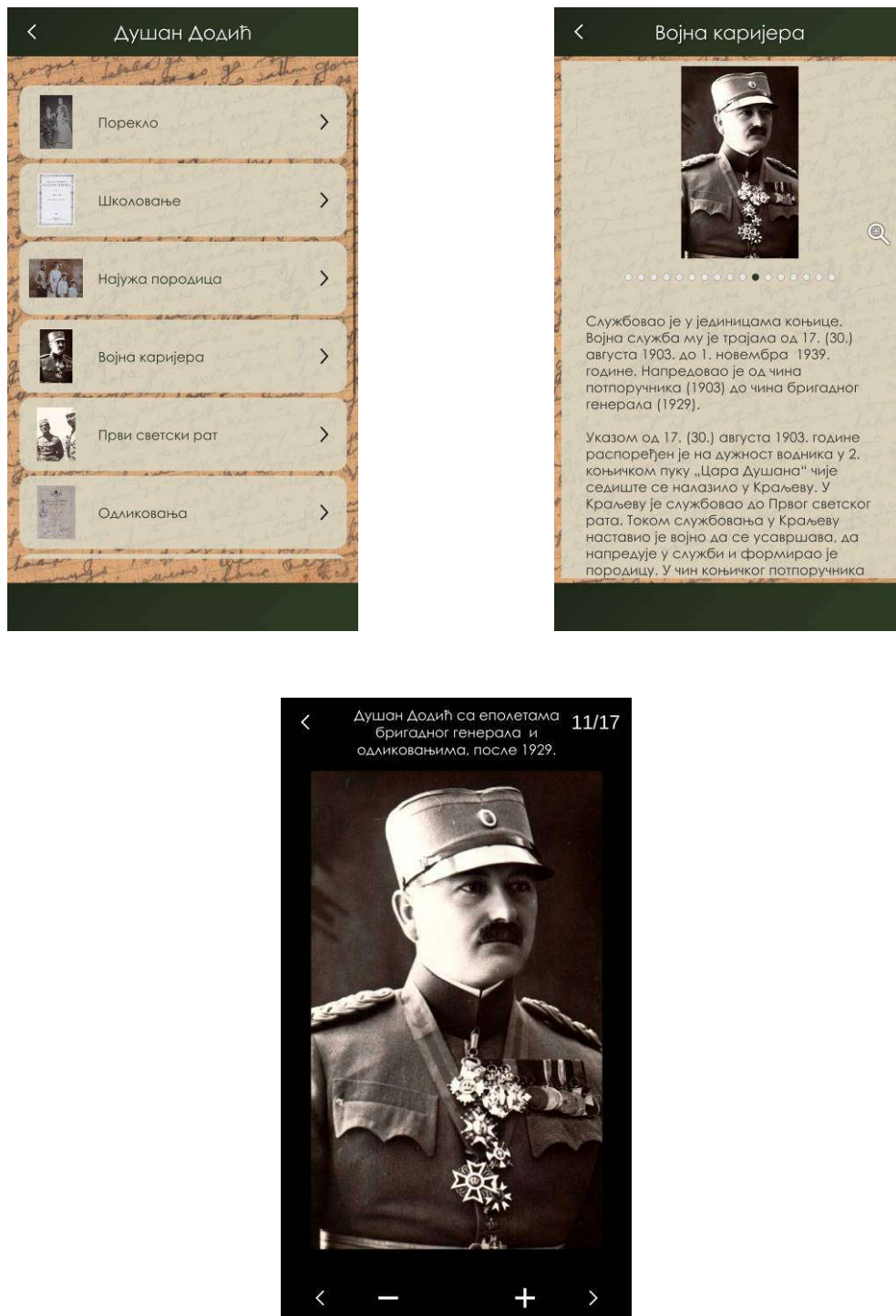
Figure 3. Section about Dušan Dodić

War Diary Handwriting (Figure 4) is embedded as the Gallery module where digitized photos of the pages of the war diary are shown.
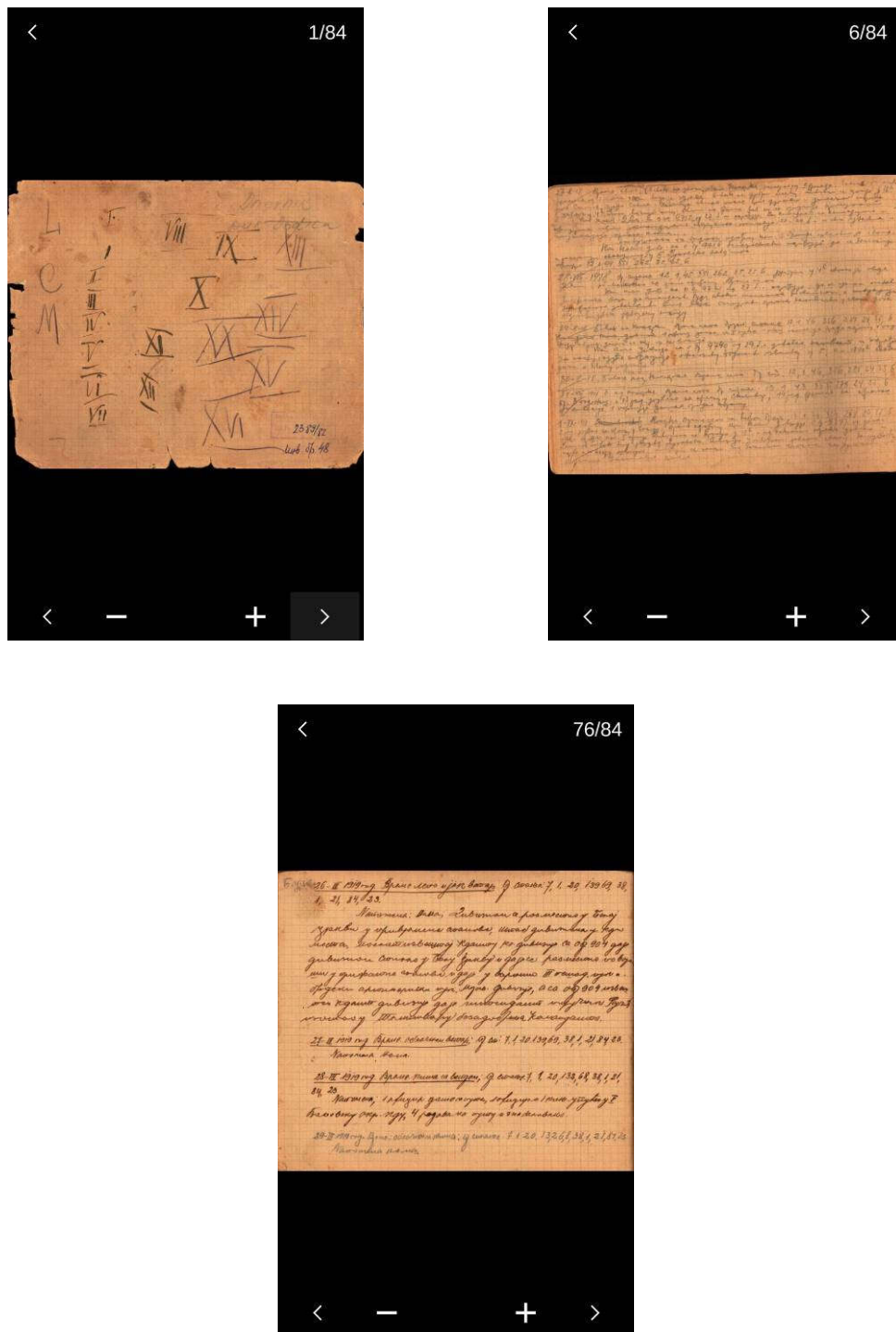
Figure 4. Scanned pages of War diary

War Diary Content (Figure 5) presents the war diary in the List module with pages in the order as they appear in the war diary. Each element of the lists is linked to the Info module where digitized photo of the page is given followed by the transcript in form of a text. The footer contains buttons that enable moving over the pages in the war diary.
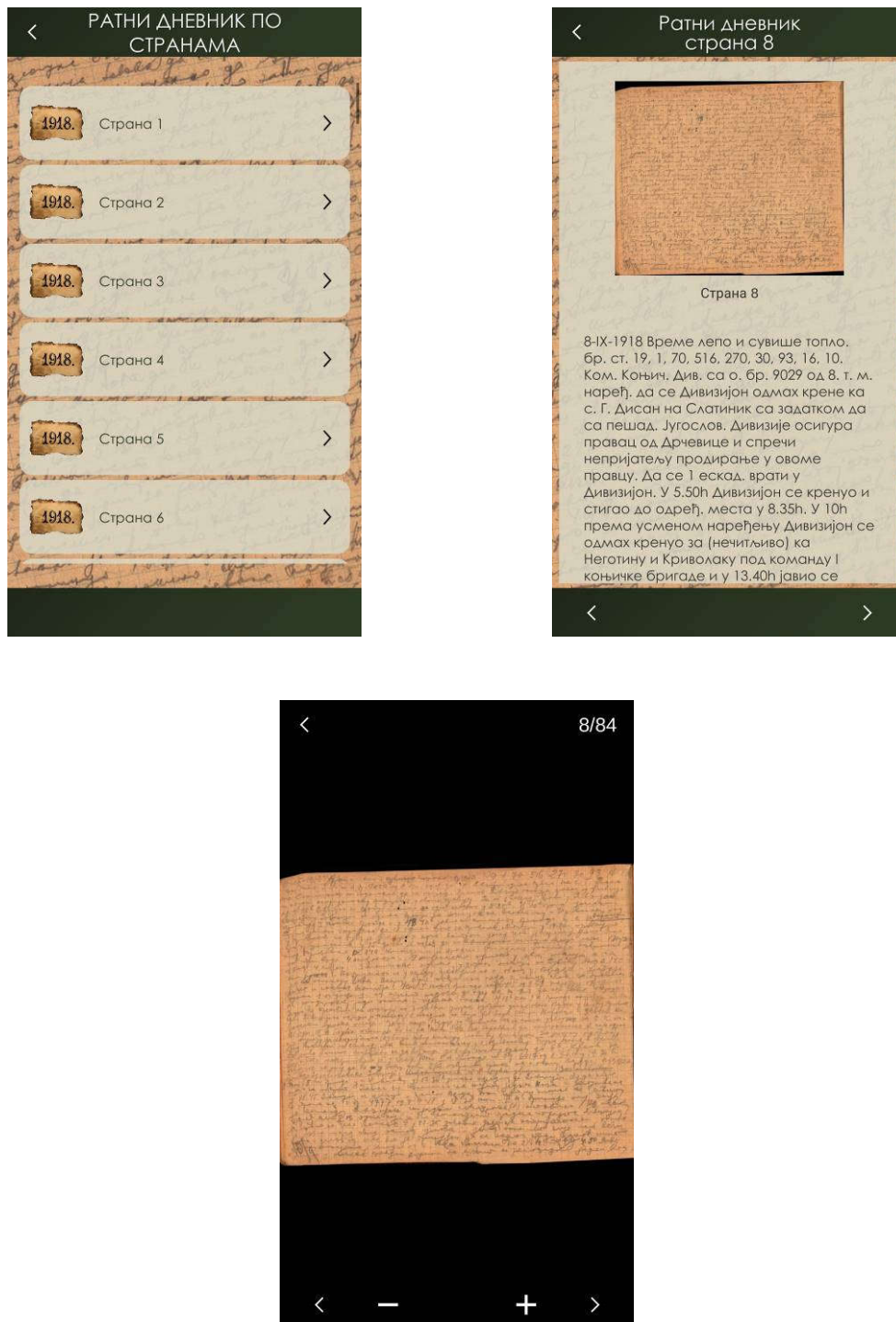
Figure 5. Pages of the war diary

The section About War Diary (Figure 6) is implemented as an Info module where it is explained how and when the text is written and some digitized photos are presented.
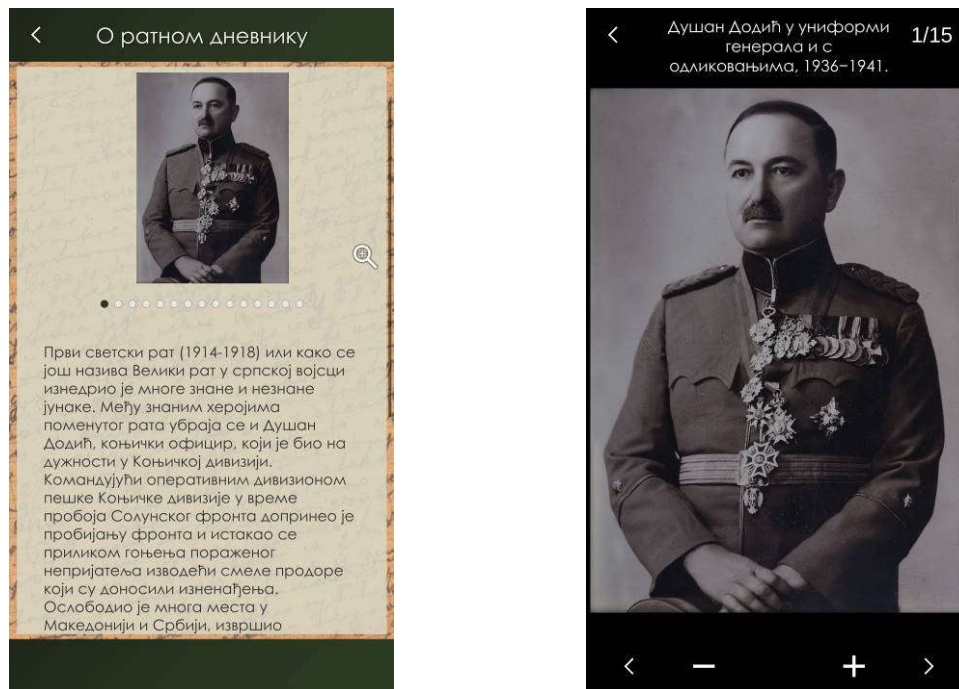
Figure 6. About War Diary section

Publications section (Figure 7) is the List module with links to the book in the pdf format about war diary and a catalogue for the exhibition *General Dušan Dodić – Hero of Great War* in the Regional museum Jagodina.
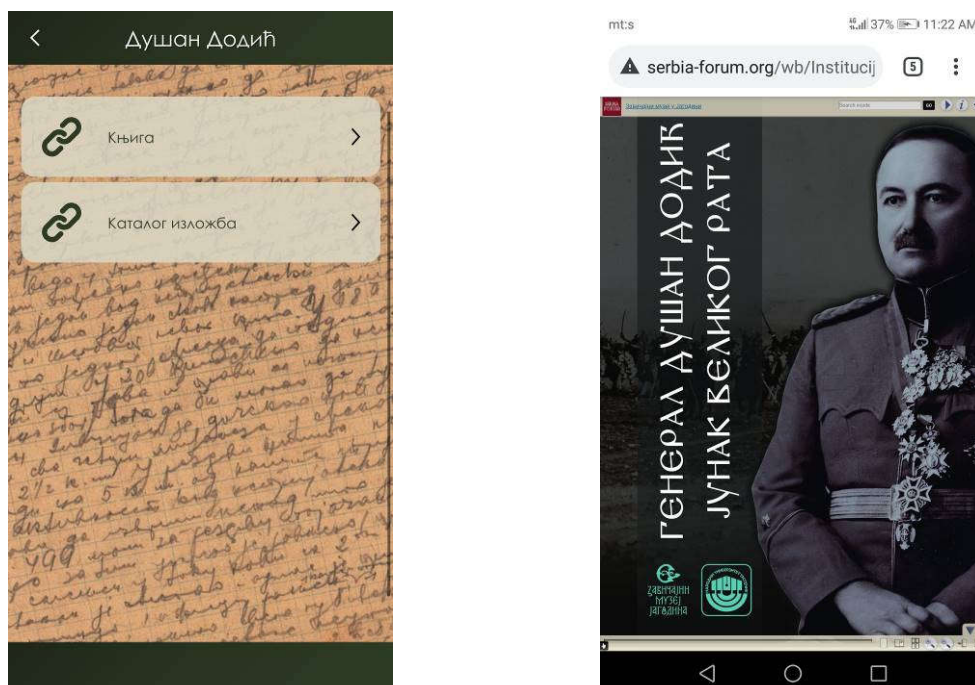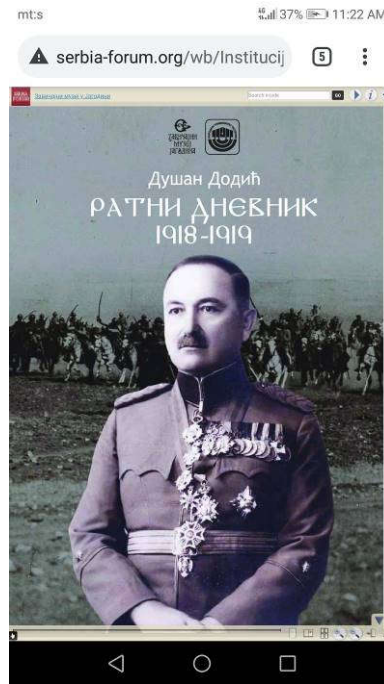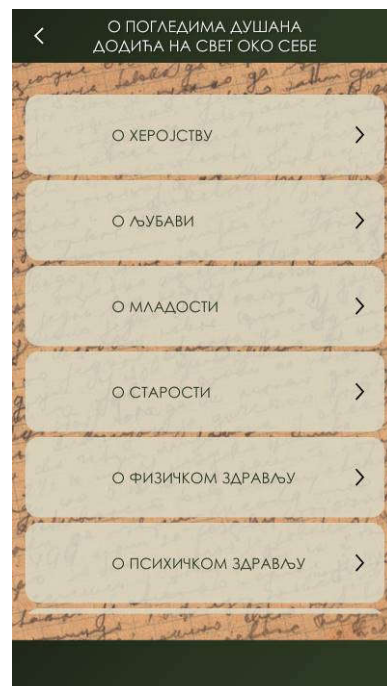
Figure 7. Publications section

Family Memories (Figure 8) presents part of the application where story about life, thoughts and descendants of Dušan Dodić are provided.
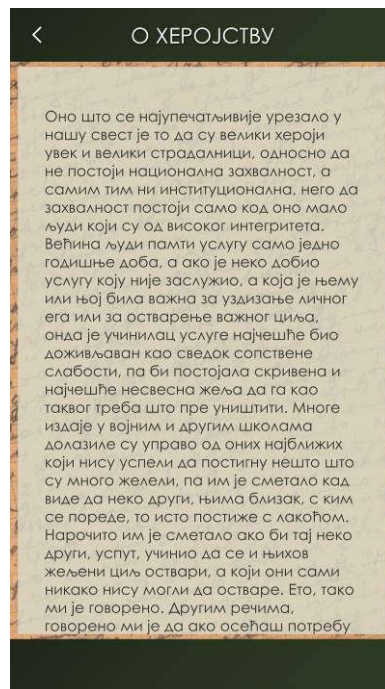
Figure 8. Family memories section

Jagodina in the Great War (Figure 9) describes the situation in the city were stories of city life, occupation and liberation in which Dušan Dodić involved are described.
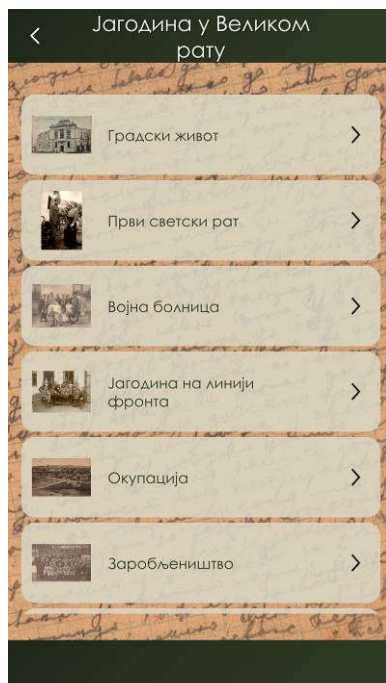
Figure 9. Jagodina in Great War section

3.2. War diary of Stojan J. Jeftić. The second war diary we want to present is the diary of Stojan J. Jeftić who was an active solder in the Serbian army during First World War in the 3rd Machine Gun Regiment of the 14th Infantry Regiment of the Timok Division. The diary was given by the family member Saša Milutinović to the Homeland Museum of Knjaževac where digitization of the historical material was done. Material was prepared in digital format and given to ARhiMedia group to realize this mobile application. At the flyer (Figure 10), there is a QR code that provides the link to this Android application on Google Play.
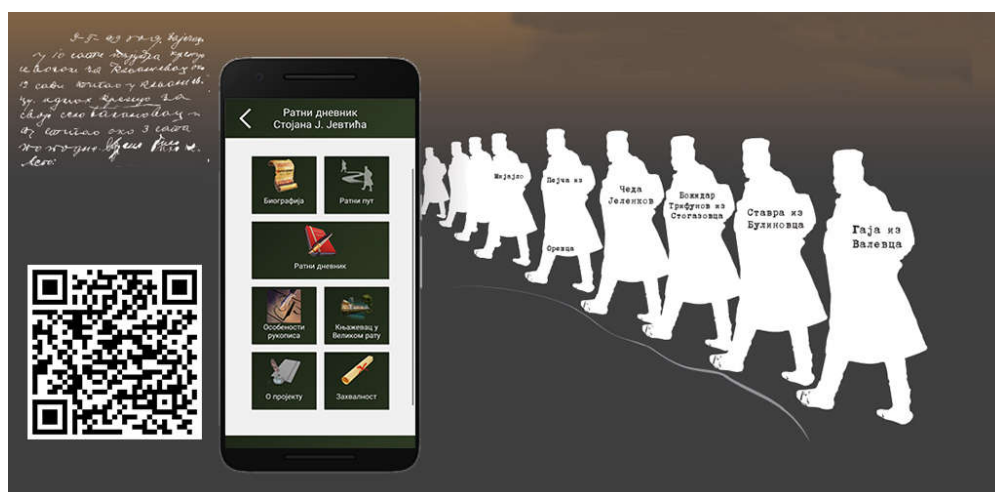

Figure 10. Flyer for the application

Main menu of the application, shown in Figure 11, presents the topics marked with the icon that concern the biography of Stojan J. Jeftić, war path, war diary, specific

features of the manuscript, Knjaževac in the Great War, and About the project, and Acknowledgment.
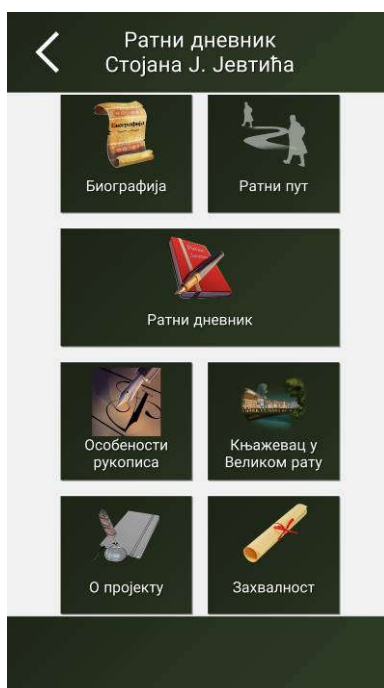

Figure 11. Main screen

Biography section (Figure 12) of Stojan J. Jeftić is realized like an Info module. It contains digitized photos and text of the biography of Stojan J. Jeftić.

Figure 12. Biography section

War path (Figure 13) is presented with Map module with marked places where the author of the diary has been during the First World War and made some notes. These places are labeled with interactive pins on the map. By interaction with the pin on

the map information like date and name of the place are shown. Also, more information is provided in the form of the transcript of the diary in the Info module.
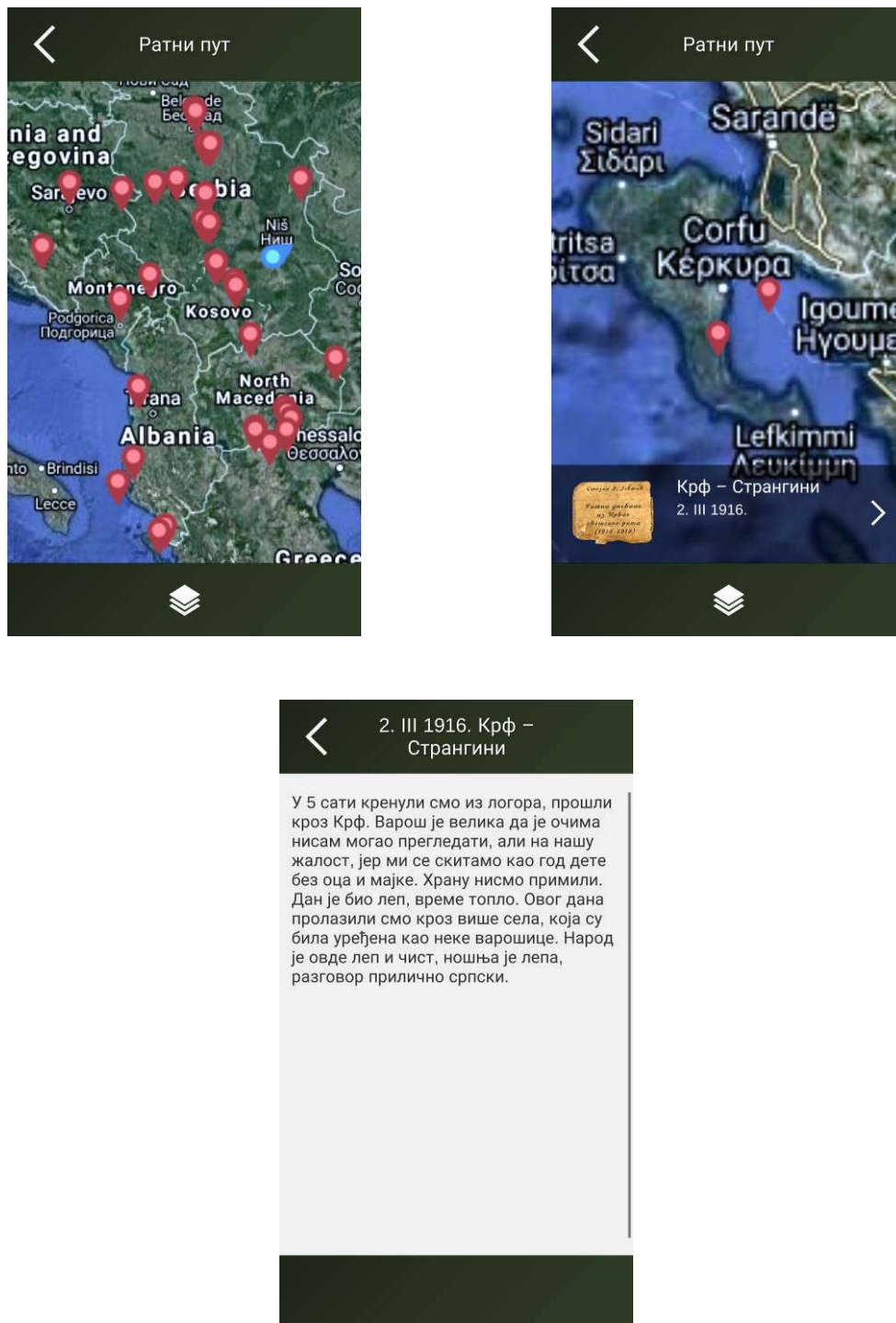

Figure 13. War path section

War diary section (Figure 14) describes selected parts of the diary sorted by dates, years, and places. Digitized part of the diary is presented in the Gallery module. Transcript of chosen parts of a diary sorted by years 1915, 1916/1917, and 1918/1919 are realized with the Info module.
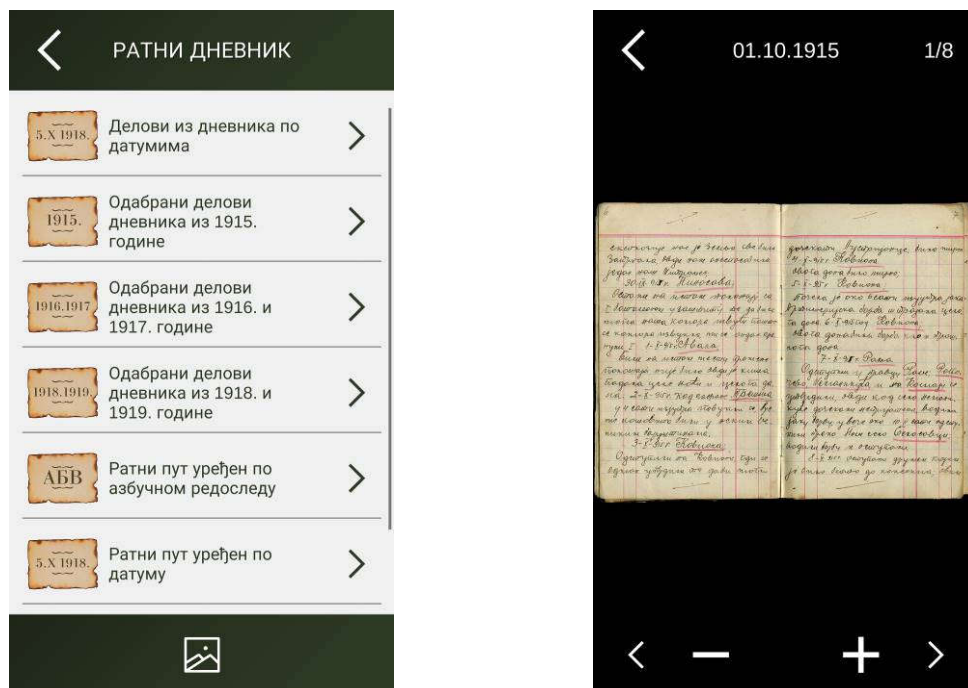
Figure 14. War diary section

Features of manuscript (Figure 15) presents the details about handwriting and its author. This part is realized with Info module.
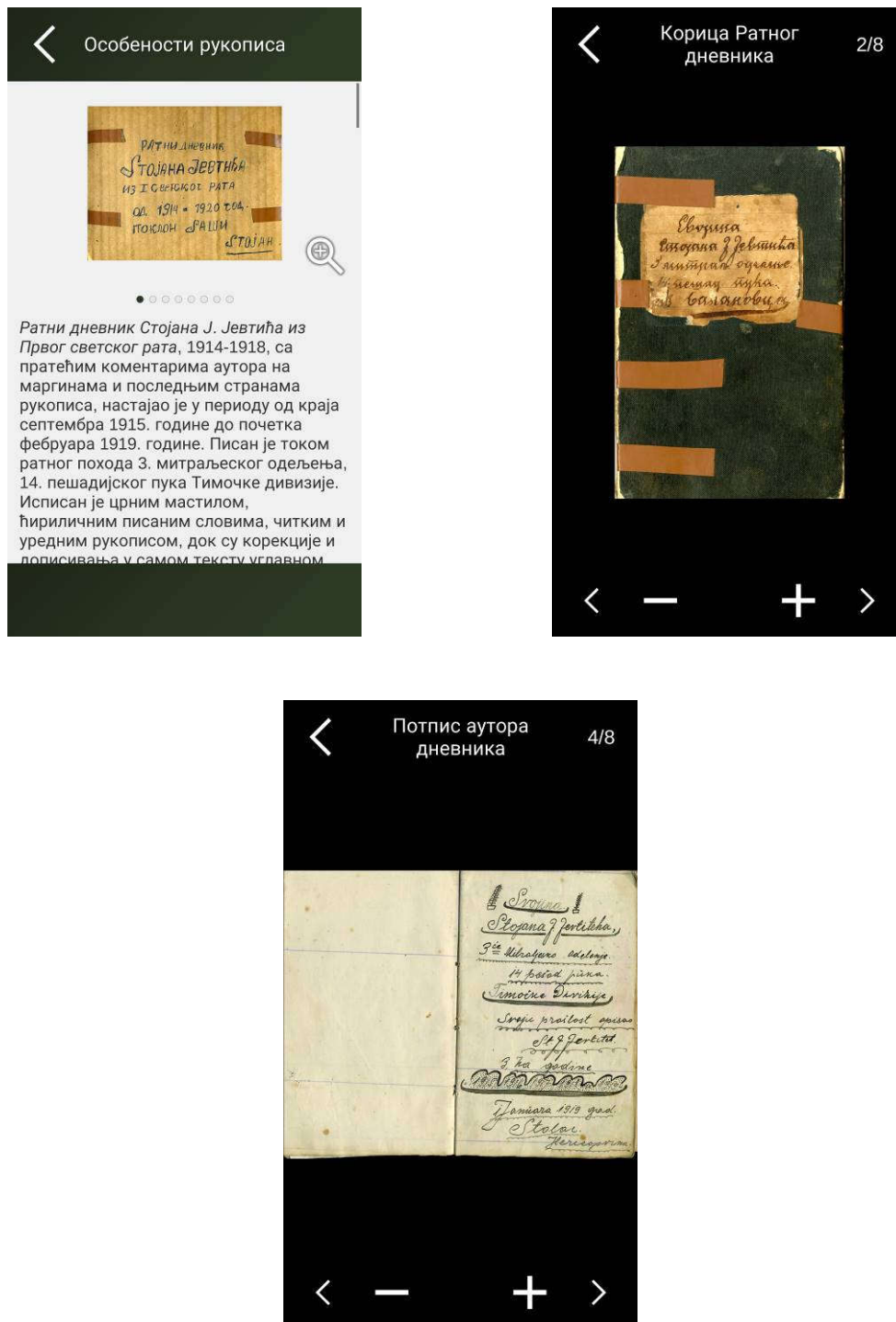
Figure 15. Features of manuscript

Knjaževac in the Great War (Figure 16) is a short story about the city from the occupation until the liberation. This section is realized with the Info module with digitized photos and accompanying text.
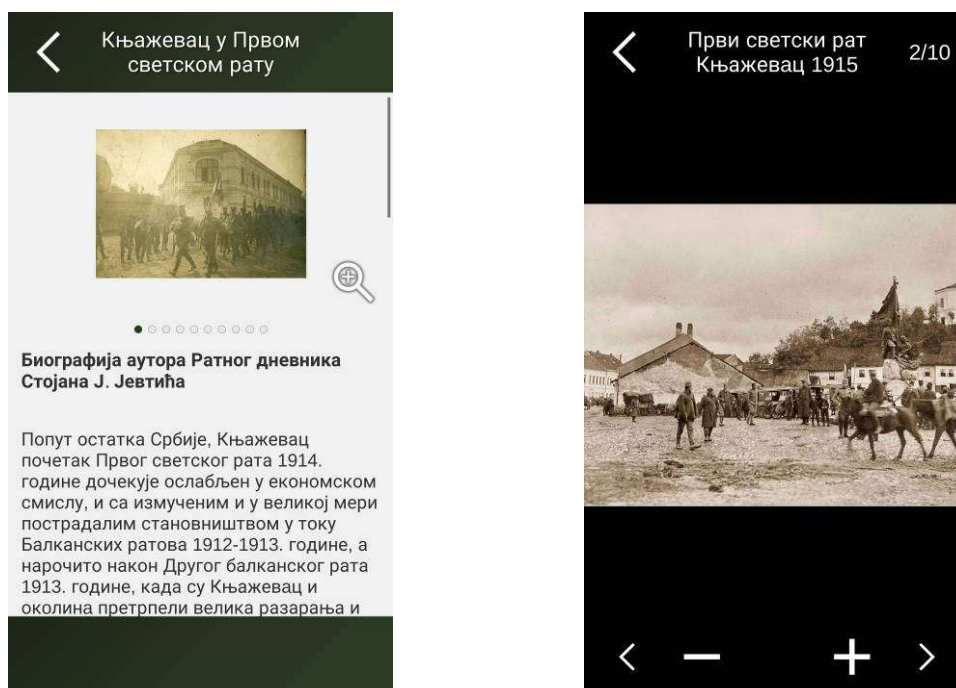
Figure 16. Knjaževac in Great War

About project and Acknowledgment (Figure 17) are parts of the application where authors of the exhibition from the Homeland Museum of Knjaževac explain the purpose of the project and express gratefulness to all members involved in this project.
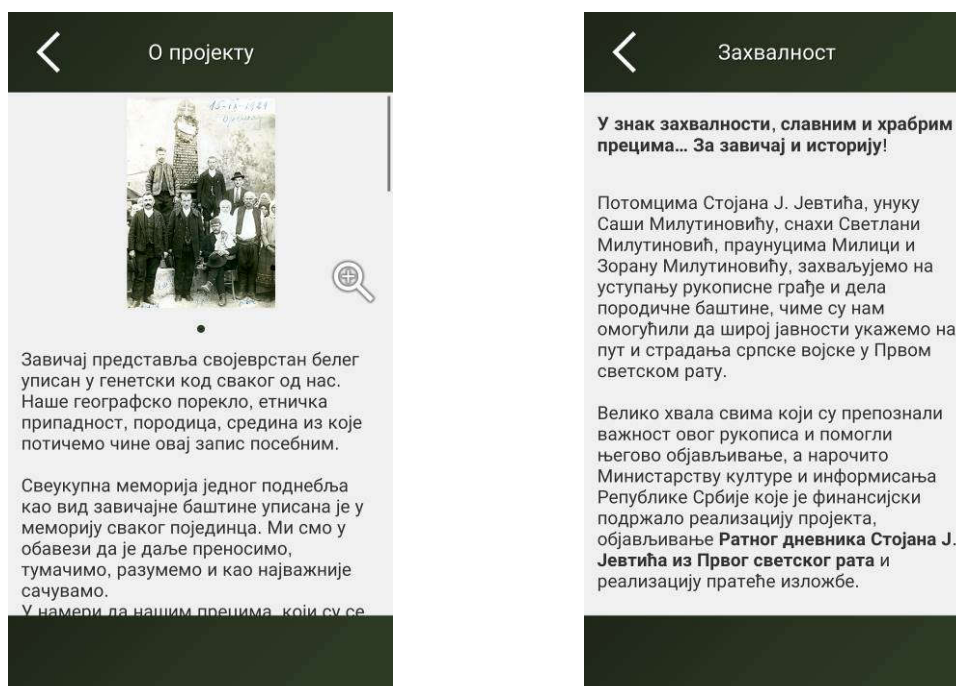

Figure 17. About project and greetings section

4. Conclusion

In this paper we presented the application of information technologies in the area of digitization of national heritage. In particular, the electronic version of war diary is realized by using mobile technologies in order to provide historical circumstances in a contemporary way. The software Unity as a multimedia cross platform solution is used to organize war diaries as mobile applications for Android and iOS mobile operating systems. The details about developed modules are provided on the examples of two mobile applications about the First World War diaries. These applications are electronic versions of war diaries of the general Dušan Dodić and the ordinary soldier Stojan J. Jeftić.

Acknowledgments

References

[1] Stanković, S., Tatić, D., "A Scenario For Application of Information Technologies in Representation of Archaeological Parks", *Review of the National Center for Digitization*, 36(2020), 1–12.

[2] Tatić, D., Stanković, R.S., Stojanović, J., Jovanović, M., "Application of Information Technologies in Presentation of Historical Heritage of Niš", *Proceedings of Conference Digitalization of Cultural Heritage in Niš Region*, May 2019, Niš, Serbia, 47–52.

[3] Ridel, B., Reuter, P., Laviole, J., Mellado, N., Couture, N., Granier, X., "The revealing flashlight: Interactive spatial augmented reality for detail exploration of cultural heritage artifacts", *Journal on Computing and Cultural Heritage (JOCCH)*, 7:2(2014), 1–18.

[4] Tso, A.W.B. and Lau, J.M.Y., "Visitors' Perception of a Multimodal Exhibition: A Case Study at the Hong Kong Heritage Museum", *Digital Humanities and New Ways of Teaching*, 2019, 177–193.

[5] Díaz, P., Bellucci, A., Yuan, C.W., Aedo, I., "Augmented experiences in cultural spaces through social participation", *Journal on Computing and Cultural Heritage (JOCCH)*, 11:4(2018), 1–18.

[6] Not, E., Cavada, D., Maule, S., Pisetti, A., Venturini, A., "Digital augmentation of historical objects through tangible interaction", *Journal on Computing and Cultural Heritage (JOCCH)*, 12:3(2019), 1–19.

[7] Stanković, R.; Tatić, D., Ognjanović, Z., "Electronic Guides – An Example of Application of Information Technologies in Representation of National Heritage", *IPSI Transactions on Advanced Research*, 16:1(2020), 39–44.

[8] Petrelli, D., "Making virtual reconstructions part of the visit: An exploratory study", *Digital Applications Archaeology and Cultural Heritage*, 15(2019), e00123.

[9] Koo, S., Kim, J., Kim, C., Kim, J., Cha, H.S., "Development of an augmented reality tour guide for a cultural heritage site", *Journal on Computing and Cultural Heritage (JOCCH)*, 12:4(2019), 1-24.

[10] Spachos, P., Plataniotis, K.N., "BLE beacons for indoor positioning at an interactive IoT-based smart museum", *IEEE Systems Journal*, 14:3(2020), 3483–3493.

[11] Tatić, D., Gajić, D.B., Stanković, R.S., "QR Codes Telling the Story about the History of Niš", *In The Fifth Int. Conf. on Digital Presentation and Preservation of Cultural and Scientific Heritage-DiPP*, Veliko Tarnovo, Bulgaria, 2015, 133–139.

dule_tatic@yahoo.com
radomir.stankovic@gmail.com
jovanovicmarko1@yahoo.com
jovan.stojanovic93@gmail.com