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# BACKGROUND INFORMATION

## Partner country

Republic of Serbia

## Contracting authority

Public Library of Merošina

## Country background

Virtual reality is still very new for the region high-tech innovative applied science, which the project plans to use for tourism development, creating VR Guides for 2 touristic sites in the cross border countries region.

In a society, which evolves with accelerating pace in the world of new technologies it is important to follow the trends, run before time and introduce the new technologies in everyday life. The new touristic service created within the project for VR Guides and related other generated VR products will increase the attractiveness of the region and the image of the region as tourist destination. Accessibility of this service through phone, web, VR points, social networks will cover the vast majority of information channels used nowadays and respond to the need of constant technological breakthrough in tourism.

The strengths of the project apart from the creation of the very useful VR Guides are mainly in the enabling of local stakeholders to receive access to the knowledge how to make VR products themselves and so to generate additional VR products for a wide variety of tourist sites in the cross-border region. The creation of such capacity inevitably will expose the region a lot better for tourism.

A weakness of the project could be that some of the users, who visit virtually some of the tourist sites may not want to see it personally, because they have already seen everything. This may be true for a part of the VR Guides users, but greater interest in the sites, generated through the visits to the web-site or the uses of VR glasses at the VR points will definitely increase the number of visitors of the sites themselves.

The work needed to develop VR Guides is extremely volumous and can not be applied to all deserving tourists sites at once. Because of this reason the project is constrained to only 2 touristic sites in the beginning, but we may also call this constrain a focus

Within this activity will be developed virtual reality Guides for 2 touristic sites from Bulgaria and Serbia. These are the Baba Vida Fortress in Vidin, for which will be made a detailed virtual reality Guide, The Guide for Baba Vida fortress will allow users to make virtual walks inside and outside the fortress, visit rooms inside, climb the towers as they exist in the present and at the same time users will be able to read and hear information, displayed at different points of the site in the VR Guide.

The selected Serbian touristic site is the archeological site Kulina, situated near the village of Gradiste in municipality Merosina. It represents remains of a Byzantine fortress dating back from the time of the reign of the Emperor Justinian I and his successors. The objective of the VR Guide for this object is to allow the user to see it reconstructed as it was in the past. To achieve this LB and PP2 will provide to the developers of the Guide specific historical information.

Both VR Guides will be accessible on Windows in high resolution, through the web-site of the project, through mobile application for phones, at virtual reality points with glasses for virtual reality. At the same time 1 short and 1 long virtual reality Guide presentation like films for each site will be developed.

All products will be uploaded on the developed for the project web-site in Bulgarian, English and Serbian language.

## Current situation in the sector

The Municipality of Merošina is world famous by the sour cherry brand called "Oblačinska višnja" and since there is no tourism organization in the Municipality, the Public library of Merošina is obligated by the Municipal Assembly's decision and by its Statute, to perform also as tourism organisation and to promote the tourist potentials of the Municipality including the "Oblačinska višnja". For the past thirteen years the Public library of Merošina has been organizing the tourism and cultural event called "The Oblačinska višnja fest" and for the last five years this became the regional event funded by the Ministry of tourism which proves that the Public library of Merošina has the necessary experience and skilled team to successfully complete planned activities under this project

## The library is the holder of library-information activity in the territory of the Municipality of Merošina and is the main initiator of the collection, preservation and promotion of the native collection of cultural, entertainment and information content. It has gained a very important reputation as an organizer of all cultural and educational events and activities in the territory of the Municipality of Merošina and activities on enriching the library fund and its approach to the users. The Public library of Merošina, in addition to the main activities included in the name, after renaming the Cultural center to the Public library in 1995, also maintained the obligation to organize a cultural and entertaining program by organizing cultural and entertainment activities. Program orientation, objectives and tasks were to transfer thoughts and messages into reality through a written word, movement, image, music or voice and thus affect cultural, artistic, educational and entertainment life in the entire municipality and surrounding environment

## Related programmes and other donor activities

Not applicable.

# OBJECTIVE, PURPOSE & EXPECTED RESULTS

## Overall objective

The overall objective of the project of which this contract will be a part is as follows:

Employing virtual reality technologies for tourism development through the creation of "open source" virtual reality tourism services based on education and increased local capacity

## Purpose

The purpose of this contract is providing development of VR Guides and VR glasses for municipality of Merošina events planned by the Project Partner 2 within project “Virtual reality and education for tourism development.

## Results to be achieved by the contractor

The Contractor should successfully to do developed VR Guides for Kulina in full-resolution Windows version; Produced VR Guides in web version and uploaded on the project website; Produced Mobile application for the VR Guides for mobile phones; Produced VR Guides for virtual reality points with VR glasses; Developed 1 short 2min and 1 long 10 min virtual reality Guide presentations like films and uploaded on youtube and website.

# ASSUMPTIONS & RISKS

## Assumptions underlying the project

The implementation of the current contract will support Public library of Merošina in the implementation process of the project “Virtual reality and education for tourism development”, and will assure compliance with the EU regulations. The following assumptions can be made in order to reduce the risks related to delay or non-realization of the activities, subject to this Terms of Reference:

* Clear understanding of the contract purpose and tasks on behalf of the Contractor;
* Full cooperation between the Contracting Authority and the Contractor in view to fulfil the tasks on time, with high quality and within the budget limitation;
* Timely information for the respective place and date of the events provided by the Contracting Authority.

## Risks

## Potential risks to the successful implementation of the contract include:

## Lack of communication and logistical coordination between the Contractor and the Contracting Authority. In order to avoid this risk, the Contractor should be proactive and maintain continuous contact with the relevant representatives of the Contracting Authority;

## Insufficient quality of the services provided by the Contractor. In order to avoid this risk the Contractor should use the most reliable and experienced staff/service providers at its disposal.

# SCOPE OF THE WORK

## General

### Description of the assignment

The assignment includes all necessary services that the Contractor shall carry out for the work mentioned in p. 4.2.

### Geographical area to be covered

The eligible area is the Serbia - Bulgaria cross-border region, specifically Nišava District, Serbia, archeological site Kulina, situated near the village of Gradiste in municipality Merosina.

### Target groups

* Public library of Merošina;
* Tourists visiting archeological site of Kulina.

## Specific work

1. Aim of the virtual reality Guides:

* The virtual reality Guides will be produced for the touristic site of Kulina in Merosina municipality. The aim of the Guides will be to reconstruct the touristic site as it existed in the past, following reliable historical sources and information, provided by the responsible partner.
* The virtual reality Guide has reconstruct the past, using virtual reality tools and be provided in versions for Windows, web; mobile application for Android, virtual reality VR headset.

1. **Indicative content of the virtual reality Guide**

Indicative content and specifications of the **virtual reality Guide** should include (but not limited) the content proposed bellow:

The virtual reality guide has to allow the user to make virtual walk in and outside the touristic site, provide information in written and voice on the click of the mouse about certain aspects of the touristic object. It has to be developed in 3 languages – Serbian, Bulgarian and English and multiplied in 100 copies, provided on DVD.

**The object is archaeologically divested and there are no completely preserved construction facilities that is going to be represented using references from Google maps and drawings of historical monuments and reconstructions based on excavations and video.**

**▪ 3D modeling must be used for building objects**

**▪ 3D reconstruction historical artefacts**

1. **Windows version** of **virtual reality Guide for PC**

* **Windows version** of **virtual reality Guide** of reconstructed tourist site **Kulina in Merosina**, view of at least 3 rooms or object inside the site; option for virtual walk around and inside the touristic site; Resolution of image Full HD or similar;
* other technical specification
* Using the technique called photogrammetry, used the information obtained from the drone to extract the so-called “point cloud”, which is used to gain the colour and the shape of the present day of object and landscape.
* Using technique of 3D modelling for creating the object based on available historical data.
* Since “point cloud” contains a huge number of polygons, have to use the retopology technique in order to optimize the number of polygons, i.e. to reduce them to the desired number that can be used for the real-time application.
* UV mapping of the object is performed in the 3D program.
* The object is then exported into a game engine in order to perform additional lightning and rendering of the scene.
* Sound and special effects are added.
* Programming the scene in order to enable interactivity with the chosen objects.
* Programming of the 360-degree rotatable historical artifact objects
* Enable Demo mode - when necessary, demo video of the scene could be played automatically, if the user does not wish to interact with the scene
* Intro screen with the settings that enable the user to choose::
  + Resolution of the screen (default resolution, as well as the other supported ones)
  + Scene graphics quality (in cases of slower computers, quality of the graphics is lowered)
  + Section “About us” to learn about the developers

**Web version of virtual reality Guide for PC**

* Web version of **virtual reality Guide** of reconstructed tourist site **Kulina in Merosina**, view of at least 3 rooms or object inside the site; option for virtual walk around and inside the touristic site; Resolution of image is optimised for internet speed conection and adopted for user resolution monitors.
* Upload of the web version on project website;
  + Using the technique called photogrammetry, used the information obtained from the drone to extract the so-called “point cloud”, which is used to gain the colour and the shape of the present day of object and landscape.
  + Using technique of 3D modelling for creating the object based on available historical data.
  + Since “point cloud” contains a huge number of polygons, we have to use the retopology technique in order to optimize the number of polygons, i.e. to reduce them to the desired number that can be used for the real-time application.
  + UV mapping of the object is performed in the 3D program.
  + The object is then exported into a game engine in order to perform additional lightning and rendering of the scene.
  + Sound and special effects are added.
  + Programming the scene in order to enable interactivity with the chosen objects.
  + Programming of the 360-degree rotatable historical artifact objects.
  + Enable Demo mode - when necessary, demo video of the scene could be played automatically, if the user does not wish to interact with the scene

**Mobile application - Android version for mobile phone and tablet**

* Mobile application for Android version of **virtual reality Guide** of reconstructed tourist site **Kulina in Merosina**, view of at least 3 rooms inside the site; option for virtual walk around and inside the touristic site; Resolution of image is optimized for mobile phone as enhanced processor of mobile phone and tablet.
* Upload of the mobile app in Google Play or dedicated server;
* Transferring the desktop application to the mobile platform
* Optimization of the 3D model for the mobile platform
* Optimization of shades for the mobile platform
* Optimization of the programming code
* Adapting the system of movement for the mobile platform.
* Testing the application for various mobile platforms.
* Using the technique called photogrammetry, used the information obtained from the drone to extract the so-called “point cloud”, which is used to gain the colour and the shape of the present day of object and landscape.
* Using technique of 3D modelling for creating the object based on available historical data.
* Since “point cloud” contains a huge number of polygons, we have to use the retopology technique in order to optimize the number of polygons, i.e. to reduce them to the desired number that can be used for the real-time application.
* UV mapping of the object is performed in the 3D program.
* The object is then exported into a game engine in order to perform additional lightning and rendering of the scene.
* Sound and special effects are added.
* Programming the scene in order to enable interactivity with the chosen objects.
* Enable Demo mode - when necessary, demo video of the scene could be played automatically, if the user does not wish to interact with the scene
* **Virtual reality for VR headset of virtual reality Guide**
* Virtual reality for VR headset of **virtual reality Guide** of reconstructed tourist site Kulina in Merosina, view of at least 3 rooms inside the site; option for virtual walk around and inside the touristic site; Resolution of image appropriate for VR headset.
* Developed 1 short virtual reality Guide presentation of a walk inside and outside the touristic site, providing historical information for the site lasting 2 minutes;
* Developed 1 long virtual reality Guide presentation of a walk inside and outside the touristic site, lasting 10 minutes;

The sustainability and dissemination of project results, planned to be conducted within the project will be ensured during the events. The Contractor must also comply with the latest Communication and Visibility Manual for EU External Actions concerning acknowledgement of EU financing of the project. (See <https://ec.europa.eu/europeaid/communication-and-visibility-manual-eu-external-actions_en>.

## Project management

### Responsible body

Public library of Merošina will be Contracting Authority for this contract. The Contracting Authority is responsible for conducting the current tender procedure, signing the service contract and carrying out the overall management and control on the contract implementation.

### Management structure

The decision making, related to the organization, is made by the director (legal representative) of Public library of Merošina. The responsible person for implementation of the tasks related to this project and this contract, in the Contracting Authority is the Project manager. His tasks regarding implementation of the contract connected with the current procedure include: correspondence with the Contractor, appointment of the specific time of events, approval of hotels for accommodation (bed and full-board), etc. Interim reports and final report will be approved by the Project manager, and the Approval Certificate will be signed by the legal representatives of both parties.

### Facilities to be provided by the contracting authority and/or other parties

No facilities or equipment will be provided by the Contracting Authority.

# LOGISTICS AND TIMING

## Location

Location of the project activities related to this contract is in Bulgarian and Serbian cross-border region, in the office of Public library of Merošina located in Serbia, Merošina 2140 and archeological site Kulina, situated near the village of Gradiste in municipality Merosina.

## Start date & period of implementation of tasks

The intended start date is 18.11.2019 and the period of implementation of the contract will be until 16 August 2020. Please see Articles 19.1 and 19.2 of the special conditions for the actual start date and period of implementation.

# REQUIREMENTS

## Staff

Note that civil servants and other staff of the public administration of the partner country, or of international/regional organisations based in the country, shall only be approved to work as experts if well justified. The justification should be submitted with the tender and shall include information on the added value the expert will bring as well as proof that the expert is seconded or on personal leave.

### Key experts

Key experts are not required.

### Other experts, support staff & backstopping

CVs for experts other than the key experts should not be submitted in the tender but the tenderer will have to demonstrate in their offer that they have access to experts with the required profiles. The contractor shall select and hire other experts as required according to the needs. The selection procedures used by the contractor to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience.

The costs for backstopping and support staff, as needed, are considered to be included in the tenderer's financial offer.

## Office accommodation

Office accommodation for each expert working on the contract is to be provided by the contractor.

## Facilities to be provided by the contractor

The contractor shall ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support their work under the contract and to ensure that its employees are paid regularly and in a timely fashion.

## Equipment

**No** equipment is to be purchased on behalf of the contracting authority / partner country as part of this service contract or transferred to the contracting authority / partner country at the end of this contract. Any equipment related to this contract which is to be acquired by the partner country must be purchased by means of a separate supply tender procedure.

# REPORTS

## Reporting requirements

The Contractor will submit the following reports in English in one original:

* **Interim report** should be submitted six months after the start of the implementation of contract. The report must be provided along with the corresponding invoice. Interim payment is envisaged on the basis of approval of the interim report proving that specific objective has been reached.
* **Final report** maximum of 5 pages in free format. This report shall be submitted no later than 10 (ten) business days after the end of implementation of tasks under the current Contract. It should provide conclusions and clear evidence of the implementation of all requested services. Approval of the final report by the Contracting Authority will be a basis for balance payment under the contract.

The reports provided by the Contractor should be prepared in English language and submitted in 1 (one) original, duly signed, stamped and dated by the legal representative of the Contractor. The interim and final report must be provided along with the corresponding invoice.

## Submission and approval of reports

The report referred to above must be submitted to the project manager identified in the contract. The project manager is responsible for approving the reports.

# MONITORING AND EVALUATION

## Definition of indicators

The indicators are specified as related to the organization of:

* Windows version of virtual reality Guide for PC provided;
* Web version of virtual reality Guide for PC provided;
* Mobile application - Android version for mobile phone and tablet provided;
* Virtual reality for VR headset of virtual reality Guide provided;

## 8.2. Special requirements

Not applicable.