# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Supply of Cloud GIS Based Information System p 1 /…**

**Publication reference:** **063 SUP – KTSO- 05**

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
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| **LOT 1 Supply of Equipment** | | | | |
| **1** | **Cloud GIS Based Information System** |  |  |  |

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|  | **LOT 1 Cloud GIS based Information system of the cultural and historical attractions in Haskovo/Edirne region in three languages (Bulgarian, Turkish, English), incl. 3D models and virtual sightseening of 4 sites, and training of the staff - 3 persons** Cloud GIS based Information System - Main features and specifications:  -Web based portal with two separate integrated cloud GIS platforms for each area – Edirne Region and Edirne;  -Spatial (geographical) representation of 88 cultural and historical attractions on the territory of Edirne Region. Such data will also be collected during the development process by providing an option to complement the database of geographic and attribute information about monuments;  -Related data / documents, charts, pictures, video, 3D image, virtual walks, etc. / for 88 Edirne Region sites;  -3D visualization and virtual tours of 4 sites in Edirne Region: with up to 10 points for each site pictured, with outdoor 360-degree overview;  -Electronic services for citizens and businesses through web based and mobile applications for Edirne Region - reports and photos of the sites and routes (paths) to access them. Publish information on the Internet;  -Quick and easy access to the database with cultural and historical attractions;  -Working with maps for cultural and historical attractions;  -Geocoding spatial information;  -Determination of optimal routes;  -Access and use of various nomenclatures;  -Eco paths, transport logistics, tourist information;  -Implementation of various data; |  |  |  |
|  | -Overview over the spatial location of attractions;  -15 minutes’ movie for Edirne region cultural and historical attractions;  -The system will be implemented in compliance with relevant international standards (ISO, OGC and Inspire).  Software architecture  The joint system will consist of:  -One joint web portal with project information, links to external sites and integrates the two cloud GIS based information system;  -Content management system for the web portal;  -Relational database management system (RDBMS) for the web portal;  -One cloud based GIS information system for Haskovo region;  -One cloud based GIS information system for Edrine region;  -Relational database management system (RDBMS) for each cloud base GIS information system.  • GIS Supply and Implementation stages for Keşan Chamber of Commece and Industry:  Activity 1: Requirements analysis for Edirne ambient:  -Analysis of the environment – the environment in which the project will be implemented will be analyzed;  -Regulatory analysis – the aim is to collect, examine and analyze all available documents for the legal framework in the field in order to establish the existing administrative norms. |  |  |  |
|  | The existing regulatory framework (laws, regulations and other administrative acts) on business processes, business rules in the system will be established. It will analyze the documents and verify the information gathered about timeliness, accuracy and correctness;  -Analyzing needs and defining system requirements - During this stage an analysis of the required functionalities will be performed - the problems to be solved by the new development will be analyzed and the possible solutions and requirements for the new system will be determined. The purpose of the analysis is to understand the business processes that are relevant to the developed software system as well as to carefully study and understand them. Business processes describe the activities performed by high-level users set out in the relevant rules and operating instructions, abstaining from the possible systems that can help them. At this stage, customer needs are analyzed and all requirements to the new system are defined in detail so that the design of the system can be made in the next stage. The activity will include detailed study and specification of requirements for the functionality of the programming modules and specification of possible interaction with other systems.  Activity 2: Design and prototyping of "cloud" GIS for cultural and historical sites in Edirne Region:  Approach and methodology for designing GIS - The development stage involves the following tasks:  -Design of cloud based GIS;  -Design of work processes;  -Designing the architecture of the system;  -Design of the database; |  |  |  |
|  | -Developing a prototype to be approved and on the basis of which the whole system will be developed;  -Development of the modules of the information system according to the requirements of the technical specification and the system design;  -Carrying out internal tests of the System (in the developer environment);  -Preparation of detailed scenarios for conducting the acceptance tests for the "Testing" and "Implementing" stages of the project.  Design of GIS – The GIS platform will contain of 6 modules:  • Sites (Cultural and Historical Attractions)  -The module takes care of the presentation of the cultural and historical attractions in the information system.  • Data Publishing in Internet  -This is the module through which information is published in the information system, data is edited, data is being updated.  • 3D models for 4 sites  -The module presents as a 3D model specific tourist attractions in the information system.  • Virtual sightseen for 4 sites  -The module presents a virtual tour of 4 tourist attractions in the information system.  • Mobile application  -The purpose of the mobile application is to provide remote access to data in the Web-based GIS platform.  • Administrative Module  -The module is designed to allow successful management of system resources, as well as continuous and effective control of system performance. Resource management activities can be divided into several logical groups. These are the following activities: |  |  |  |
|  | • Managing access to system resources;  • Provides administrators with access to all system resources, nomenclature tables and records, customer data, service data, and other system resources;  • Managing users, creating roles to access system resources.  • Design of incoming and outgoing communication flows  • The design of incoming and outgoing information streams will take place in the following steps:  -Defining issues and needs;  -Select appropriate incoming and outgoing feeds;  -Description and analysis of incoming and outgoing information flows:  • Collecting information;  • Design of architecture;  • Detailed description;  • Validation of models.  -Defining expected benefits and results;  -Provision of resources;  -Providing technical infrastructure for implementation.  • Preparation of the architectural design of the system  -Modules will be based on a technology platform and architecture that will ensure their vitality, timeliness, professional support and openness for full development over a long period of time;  -The design will allow for future expansion and upgrades;  -System architecture will store its spatial data in a format that is open and accessible from various mature applications and technologies;  -Multiuser access for viewing and reference will be maintained. |  |  |  |
|  | • Designing the database  The design of the database will be followed by the good practices for design and interaction with the database, incl.:  -the design of the database scheme will have a maximum level of normalization unless this would seriously damage productivity;  -the names of the tables and columns will follow a unified convention;  -indexes will be created on certain columns to optimize the most commonly used queries; the creation of an index will be motivated and supported by measurements;  -Relationships between tables will be defined by a foreign key.  • Prepare a detailed cloud GIS project  The project preparation covers the following activities:  -Create a detailed timetable for the implementation of the activities;  -Implementation of the activities set in the schedule;  -Provision of the necessary resources in accordance with the scope, volume and deadlines for the respective activity;  -Effective allocation of resources by activity;  -Effective coordination of all activities during the execution of the order;  -Continuous interaction between the project implementation teams throughout the implementation process;  -Dynamic reassessment and identification of new risks;  -Quality management and quality assurance. |  |  |  |
|  | • Prototype of the system  The main objective of the Prototype is to lay the foundation of the architecture of the system and to prepare the bases for the Development and Implementation phase. The architecture of the prototype will conform to the most important system requirements. The prototype validates the architecture. Goals:  -Ensure that the architecture, requirements and plans are sufficiently robust and that the risks are assessed so that the development can be completed within the required deadlines and budget;  -All significant risks to architecture are identified;  -Establishing the basics of architecture for all relevant scenarios;  -Complete development of the development environment, setting up development tools, and preparing templates.  Activities:  -Identify, validate and lay the foundations of architecture;  -Clear vision based on the new information received during this phase, identifying and understanding the most critical consumer cases arising from architectural and planning decisions;  -Detailed plans;  -Creating a development environment, including setting up tools for the development and automation of some processes;  -Detailing the architecture and selecting the components. Potential components are evaluated against the most important scenarios. |  |  |  |
|  | Activity 3: Integration of available data on cultural and historical sites in Edirne region and introduction of additional ones not available at the moment.  Data integration will be accomplished by performing the following activities:  • Data providing – the possible sources of data are: partner data available, Google web services, Microsoft Bing services, OpenStreetMap, newly generated data within the project, and others;  • Data Analysis - At this stage of the migration process, a thorough analysis of the data subject to migration is carried out: scope, structure, completeness. The parameters of the technological compatibility of the data from the source and the target structures are determined, decisions are made on the technical realization of the process;  • Define the scope of data migration - Based on the analysis, it is determined how much of the data needs to be migrated;  • Loading data into tables in the database system - Loading data into tables in the system database where they will be stored. This is the stage of the actual migration of the migrated data from the originator to the data warehouse target structure;  • Generate metadata for migrated data - Generate metadata for migrated data and update existing metadata, if needed. Bring the loaded data into the information accessibility required by the application via metadata;  • Migration - The entered data from the registers in digital format is migrated according to the adopted data model using created forms and templates. The migration process encompasses the sequential execution of the following steps: |  |  |  |
|  | o Reading data - Validation of the format of the submitted data is carried out according to the approved specifications;  o Record data in temporary structures in PostgreSQL Database - the data is saved in the form in which it is filed;  o Check the consistency data, review the compliance of the nomenclature values - perform detailed checks: whether the values in the required fields have been filled in; is there a correspondence between the existing nomenclature units in the DB and the values in the migration data - an extremely important stage, the fulfillment of which depends on the success of the whole process;  o Genuine data migration - When user migration is confirmed, all data processing is performed and they are added to the system;  o Reporting on the success or failure of migration.  1.1. Activity 4: Supply and Implementation of cloud GIS for cultural and historical sites on the territory of the Edirne with 6 modules:  The delivery and deployment of Cloud-based GIS will be accomplished by following the steps:  • Providing for use and deployment of needed software:  o Providing for use and deployment of DBMS:  - Support standard relational data types;  - Have mechanisms for archiving the database and remote storage;  - To maintain tools for creating, changing and recording all database objects, including stored procedures and functions; |  |  |  |
|  | - To store and execute logic developed in its own programming language as well as JAVA and / or .NET or equivalent;  - Minimum access to external applications with standard access protocols for databases;  - Support indexing of spatial data, allowing for high performance when working with spatial queries;  - Data security mechanisms, archive and recovery capabilities;  - Storing of graphical and attribute data and metadata;  - Support of a large enough size and number of records;  - Communication (interoperability) with the supplied desktop software;  - Support for geographic (spatial) query types;  - Transaction support;  - Independence of the operating system;  - Support TR alphabet.  o Providing for use and deployment of Geographic Application Server  - Being open source, and when delivering commercial GIS software, licensing will be included in the delivery, and will not be limited in time and functionality;  - Possibility of simultaneous transmission / servicing of data to many web-based clients using only a standard browser;  - Internal Link Reading and Sharing with Attribute and Spatial Data to Database Management System (DBMS);  - Possibilities for selections through spatial queries;  - Maintenance of thematic layers; |  |  |  |
|  | - Caching capabilities to improve and accelerate serving Web data;  - Will be able to install both Windows-based operating systems and Linux-based operating systems.  • Implementation of cloud based GIS information system;  o The actual development of the system will be carried out using the products provided;  o Compliance testing of the developed system will be performed;  o Verification will be carried out to respect the system architecture;  o Test data will be loaded for development purposes;  • Installation, Configuration and Settings  o Installation of all programmed products and all necessary settings for their operation will be carried out;  o Configuration and settings will be performed;  o Development of a productive environment - operating systems, communication interfaces, databases, basic software products.  1.2. Activity 5: Testing, deployment and training:  • Testing  o The main purpose of the test is to make an objective assessment and ensure the quality of the system. This will include detecting defects, validating that the modules conform to the approved design and meet all the specified requirements. The mistakes and inconsistencies in the functionality of the developed software will be solved in order to achieve the objective of the project - fully developed and functioning modules, as set out in the Technical Specification; |  |  |  |
|  | o Testing will be carried out in parallel with the development;  o The tests will cover both the programmed modules and their interaction with existing software applications with which to integrate.  • Deployment  o The developed and installed modules will be implemented in real exploitation.  • Training  o Three people will be trained to work with the developed modules of the system. |  |  |  |

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| **For LOT 2: Delivery of Equipment and Software** | | | | |
| **2.1.** | **Delivery of Equipment and Software** |  |  |  |
| **2.1.1.** | **Augmented Reality Software for traditional costumes**  Augmented Reality Software for traditional costumes will be supplied from the region of Edirne as a direct live view of a physical environment with the visitors whose elements are "augmented" by computer-generated perceptual information, ideally across multiple sensory modalities, including visual, auditory, haptic, somatosensory, and olfactory. The overlaid sensory information will be constructive (i.e. additive to the natural environment) and is spatial registered with the physical world such that it is perceived as an immersive aspect of the real environment of the traditional costumes. In this way, Augmented reality for traditional costumes alters one’s current perception of a real world environment, whereas virtual reality replaces the real world environment with a simulated one.  The primary value of Augmented reality is that it brings components of the digital world of the traditional costumes into a person's perception of the real world with his own view, and does so not as a simple display of data, but through the integration of immersive sensations that are perceived as natural parts of an environment.  Augmented reality will enhance the natural environments or situations and offer perceptually enriched experiences with traditional costumes from Edirne area. With the help of advanced AR technologies (e.g. adding computer vision and object recognition) the information about the costumes to the user becomes interactive and digitally manipulable. Information about the environment of the traditional costumes and its objects is overlaid on the real world. This information is virtual, provided by the Keşan Chamber of Commece and Industry, e.g. seeing other real sensed or measured information such as user photo or video picture. Augmented reality this way will be helpful in gathering and sharing tacit knowledge. Augmentation techniques will be performed in real time and in semantic context with environmental elements. for education introducing traditional costumes from different times in the area of Edirne.  The key point on this activity is the development of the 3D models of the traditional costumes from different historical periods especially for the area of Edirne as well as for men and women. These models will be performed “live” with particular visitor of the Keşan Chamber of Commece and Industry facilities with his own height and size.  The scope of work will consist the following activities:  1.Developing software for AR Mirror installation:                Developing augmented reality system with body tracking,  Developing graphical user interface for navigating the system and selecting different clothes;  Implanting the 3D models of the clothes in the system;  Purchase additional plug-ins and software;   2. 3D modeling: 3D modelling of four Turkish national clothes for AR purpose.    3. Implementation of the system on-site&   Implementation of the system over hardware of the client  Testing the system |  |  |  |
|  | Immersive perceptual information is combined with supplemental information like scores over a live video feed of the visitor. This combines the benefits of augmented reality technology for education introducing traditional costumes from different times in the area of Edirne. |  |  |  |
| **2.1.2.** | **GIS workstations**   1. Key features of the hardware configuration for **GIS workstations** – 2 pc.:   • Processor: 2x8 cores, 2.1 GHz  • Memory: 2х8 GB DDr4 Reg. ECC  • Video: 2GB GDDR5 PCI-E 3.0  • Hard disks: 2x500 GB or 1 TB (raid1) SATA 6Gb/s  • DVD player, USB ports  • Monitor: 26 inches wide screen  • Operating system  • Auxiliary appliances: keyboard, mouse, headset with microphone |  |  |  |
| **2.1.3.** | **TV Set**   1. Key features of the hardware configuration for **Augmented Reality** – 1 pc.:  * **TV Set** * Display Technology: LED TV * Wide Screen in inches: 65.0 " * Resolution: 4k ULTRA HD 3840 x 2160 * Refresh: PQI 3400 or equivalent * SMART TV * HDMI: x 4 |  |  |  |
| **2.1.4.** | **Sensor/Video Camera**   * **Sensor/Video Camera** * Resolution : 14.2 MPx * Type : FLASH MEMORY * Wide Screen in inch: 3.5 " * Zoom: 160x |  |  |  |
| **2.1.5.** | **PC**  • Processor: 2x8 cores, 2.1 GHz  • Memory: 2х8 GB DDr4 Reg. ECC  • Video: 2GB GDDR5 PCI-E 3.0  • Hard disks: 2x500 GB or 1 TB (raid1) SATA 6Gb/s  • DVD player, USB ports  • Monitor: 26 inches wide screen  • Operating system  • Auxiliary appliances: keyboard, mouse, headset with microphone |  |  |  |
| **2.1.6.** | **Digital models of the Haskovo/Edirne area M1:100000**  Server license to use the digital model of the Edirne area M: 1:100 000 with the following layers:  • Administrative division  • Settlements  • Relief  • Hydrology  • Road network  • Points of interest / administrative, educational, health, etc.  Projection: BGS 2000/WGS 84 UTM 35 |  |  |  |
| **2.1.7.** | **Digital models of the city of Haskovo/Edirne M 1:5 000**  Server license to use the digital model of the city of Edirne M: 1:5 000 with the following layers:  • Streets  • Addresses  • Areas, neighbourhoods, etc.  • Railway and Hydrography  • Points of interest / administrative, educational, health, etc. /  Projection: BGS 2000/WGS 84 UTM 35 |  |  |  |