

Deliverable 2.1

«Implementation Study»

Project:

«Design of WEB-GIS Platform under the
Framework of “ADRIATIC-ROYTE – Adriatic
Route for Thematic Tourism”»



Partner: **Region of Epirus (GR)**

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Introduction

The present document aims to present all the issues related to the development of the AdriaticRoute WebGIS platform and set a consultation framework among all stakeholders.

The issues presented are the following:

- **STATE OF THE ART**
Tourism Trends as well as the related to the sector technological trends are illustrated in order to set the basis for developing a contemporary system that will cover most of the current needs of possible users.
- **USER REQUIREMENTS**
The stakeholders – users of the system are identified and their expected requirements are recorded.
- **FUNCTIONAL & TECHNICAL SPECIFICATIONS**
The functionality provided to each user group is presented. Additionally, the technical specifications of all system components as well as general system requirement are identified. Finally, the content that needs to be collected and the methodology to achieve that has been set.
- **PILOT OPERATION - TECHNICAL SUPPORT – TRAINING**
The required services beside system design and development are presented in detail.
- **TIMETABLE**
The time chart with all the activities up to the end of the project has been created and will serve as our guide.

For some topics there are question that each partner shall answer either by agreeing with the set parameters or by providing a new point of view that might create added value to the system.

1. THE PROJECT "ADRIATIC-ROUTE"

ADRIATIC-ROUTE represents a project that is based on the use of new ICT (information and communication technologies) as well as on the promotion of awareness and enhancement of the territory in culture and multimedia. It aims at promoting alternative forms of tourism in the Adriatic area through multimodal transport systems. The ultimate goal is to increase mobility in the participating regions for thematic tourism purposes, with special emphasis on gastronomy, while at the same time promoting accessibility from one region / country to the other. The term "Gastronomy" implies both culture and foodbeverages, thus it represents a significant sector with great potential in the cross-border area.

This goal will be achieved through the development of a Web-GIS platform (available in all partners' languages plus English) that will bridge tourism/cultural/natural resources and transport systems of the participating regions while at the same time it will improve accessibility to information and services to tourism/cultural/natural resources and transport systems. Mobile applications (for iOS, Android and Windows-based mobile phones) will enhance the platform's usability and will extend the accessibility to the platform to a wider range of communication media. Furthermore, in order to exploit the full potential of modern communication media, the platform will also integrate social media applications and will be presented as well through social media (facebook, twitter).

The platform will promote local identities and will include the following information:

- Natural and cultural resources of each participating area, tourism infrastructures, classification according to the specific form of thematic tourism (e.g. cultural, gastronomic, rural, religious, athletic etc.), calendar with relevant events, and map representation with the use of multimedia tools (video, text, photos, virtual tours etc.);
- Graphical representation of transport networks, systems and infrastructures and calculation of optimum routes between two points. A certain degree of flexibility regarding the manipulation of content integrated in the platform will be provided in order to accommodate all partners' requirements;
- Mobile applications for the presentation on mobile environment of information regarding natural and cultural resources and GIS (geographic information system) information;

- Social media applications and presentations of the platform in social media (such as facebook, twitter, etc.).

The specific characteristics, layout, architecture and content of the platform to be built will be scrutinized through the joint analysis / diagnosis, benchmarking and formulation of strategic and operational plans of all participating regions and by active, continuous collaboration and consultation with all relevant local, regional and national stakeholders.

It should be highlighted that the project does not entail R&D activities, since it is based on existing, widely used and already tested ICT tools and applications. Moreover ADRIATIC-ROUTE does not overlap existing initiatives at local/regional or even national level, rather it attempts to embrace them in a wider Adriatic context.

Target groups of the project outcomes are tourists, researchers, students, enterprises and associations active in the agrofood and tourism industry, cultural organizations and other organizations within the tourism industry.

1.1 Background

As competition between tourism destinations increases, local culture is becoming an increasingly valuable source of new products and activities to attract and amuse tourists. Gastronomy has a particularly important role to play in this, not only because food is central to the tourist experience, but also because gastronomy has become a significant source of identity formation in postmodern societies.

Other than gastronomy and culture, alternative forms of tourism include also rural tourism, religious tourism, eco-tourism, sports tourism etc. Benefits brought by the development and promotion of those forms of tourism are significant:

- Prolongation of tourism season
- Expansion of tourism activities (i.e. differentiation of the tourism product)
- Promotion of local identities
- Creation of sustainable and high-quality jobs
- Attraction of high-income, educated and sophisticated tourists.

Furthermore, alternative forms of tourism seem to represent a continuously growing market segment which is expected to account for 20% of all travel, set to grow faster than any other segment. The World Tourism Organization (WTO) predicts that most of the increase in European tourism receipts in the next decades will come from alternative forms of travel. Exploitation of alternative forms of tourism leads to the development of a more sustainable form of tourism.

The cross-border area of the IPA Adriatic CBC Programme has a significant comparative advantage in terms of cultural, natural and human resources, as presented in the IPA Adriatic Cross-Border Cooperation Programme, which offer vast opportunities for the sustainable development of tourism. The lack however of a systematized approach for the promotion of the whole territory and the weak horizontal and vertical integration of tourism, combined with seasonality and massiveness of tourism in many Adriatic areas, implies that alternative forms of tourism have not been thoroughly examined and exploited in the cross-border area, leaving thus a lot of space for formulation and implementation of relevant common initiatives. Furthermore, the lack of accessibility to touristic information along with the limited number of communication media used for the promotion of tourism/cultural/natural resources highlight the need for a more integrated ICT-based approach.

There are few initiatives currently on the promotion of tourism/cultural/natural resources through the web that however put emphasis merely on the resources themselves and have mostly a pure local/regional focus. Unlike them, ADRIATIC-ROUTE aims at combining those resources with the available transport infrastructures, since accessibility is among the key criteria for selecting a tourism destination, as well as to embrace the whole Adriatic area through common presentation and promotion and facilitate transfer from one region / country to the other.

1.2 Objectives

ADRIATIC-ROUTE aims at promoting cultural, gastronomic and other alternative forms of tourism in the surrounding countries of the Adriatic Sea basin through the use of multimodal transport systems. The ultimate goal is to increase mobility in the participating regions for thematic tourism purposes, while at the same time promoting accessibility from one region / country to the other.

This goal will be achieved through the development of an Adriatic Web-GIS platform (available in all partners' languages plus English) that will bridge cultures and transport systems of the participating regions.

Furthermore, the project aims at achieving the following specific objectives:

- Increase / enhance the capacity of Adriatic authorities in promoting their local / regional identities and alternative forms of tourism;
- Develop new trans-Adriatic tourism products ("routes" on cultural and thematic tourism in the Adriatic area);
- Create networks among project partners and wider groups of stakeholders focusing on exchanging experiences, knowhow and information and coordinate the formulation of policies on promoting thematic tourism through the use of new technologies;
- Improve accessibility to tourism/cultural/natural resources;
- Minimize seasonality of tourism and improve the quality of tourists attracted in the participating areas through the reinforcement of cooperation and the common development of the identified activities in the participating areas;
- Improve the visibility of cultural assets and natural wealth of the participating areas;
- Exploit efficiently and for the benefit of local actors, the tourism product of the participating areas;
- Diffuse and disseminate project's results and good practices gathered, in order to achieve multiplier effects.

The project promotes joint ventures in the tourism sector while the cooperation actions proposed concern cultural and natural heritage, training, institutional capacity

building and investment promotion. Cross-border cooperation will assist in harmonizing mobility and attractiveness of the participating regions as far as tourism is concerned. This will be achieved through the exchange of know-how, the application of innovative ideas in the promotion of thematic tourism in each country and the expansion of the thematic tourism product range. Last but not least, an integrated approach in promoting the tourism product and an increased visibility to all participating regions, for potential visitors of one participating region, will create a chain effect in promoting tourism and attracting visitors to all areas.

2. THEMATIC TOURISM – STATE OF THE ART

2.1 Tourism Trends

Tourism is the most important "industry" that Greece has to show for. This phenomenon is usual for the economies of the rest of the Mediterranean countries, as tourism corresponds to a great percentage of the gross national product, occupying in permanent or seasonal basis a large number of workers. The existing social and economical conditions have changed notably the life of the citizens, the majority of whom have, as tourists, significantly different habits compared to those of the past decade. On the other hand, the growth and the dissemination of the Internet provided them with a powerful tool for getting informed, as well as comparing and choosing the best tourist motions, able to satisfy their demands and their economic status.

Internet managed to break the closed and mazy tourist circuit, by bringing in direct contact the customer and the producer of the touristic product. This resulted to severe and catalytic repercussions in the market, causing it to pivot by the new channel of communication and transaction, literally transforming a strongly traditional sector.

It is easily understood that, due to many and heterogeneous demands, tourism constitutes a sector with many specifics, since there is no certain solution able to satisfy all needs. On the other hand, it regards an "industry" of services in which the human factor plays a leading role in customer experience and satisfaction. The tourist "industry" is highly competitive and tourists have unlimited freedom regarding information retrieval and accepting or declining the tourist services that are offered. The organizations that will realize in time how this new game is played, and adjust appropriately their methodology for attracting new customers, will be those who serve the tourists of the future.

Given the dominion of the Internet usage in the tourist domain in the world scale, which can be proved by the research done by **Eurobarometer (Survey on the attitudes of Europeans towards tourism)**, high priority is placed on the

reclamation of the advantages that are offered for the proper and holistic touristic promotion of the participating areas.

The internet constitutes the second most important source of information and final selection of tourist destinations for the average European citizen (Percentage overall: 42%) after "friend and family recommendations" (Percentage overall: 58%).

This percentage appears to be bigger in northern-European countries and smaller in eastern-European countries (this divergence is due to the fact that internet infiltration is smaller in those countries)

2.1.1 International Trends & Prospects

Dramatic changes took place in tourism market during the last years. As indications suggest, market will continue to be fickle and volatile. Therefore the need to adjust the product and its marketing, in order to adjust to the new conditions, is quite obvious.

The latest trends according to the European Travel Commission are the following:

1. An increasing number of tourists don't just choose a specific destination, but seek a unique experience. This means that destination management organizations should be more creative in their promotional actions.
2. The need for authentic experiences, like getting in touch with the local culture and nature, will keep rising particularly between older age groups.
3. Although the largest tourism organizations consider that the tourist package is far from its extinction, even if the demand for personalized solutions is increased, those who will prevail in the future will be the destinations and the providers who will develop user-friendly websites, that provide the possibility of virtual tours, creation of dynamic packages and instantaneous reservations.
4. Consumers are less faithful to providers and have increasingly unpredictable behaviour, e.g. the combination of touristic products and services.
5. People will continue to go on frequent but short-termed trips and the demand for long-termed trips will continue rising as well.

The doctrine of *"give the customers what they want, or someone else will"* holds true to a very large extent, in the tourism sector. The more technology is involved in the domain of tourism, the more intense are the centrifugal powers. Consumers, ie the final users of tourist products and services, will keep playing a leading role in the market transformation. The growing number of Internet users (each user is a potential tourist) will keep strengthening the gravity of the digital medium versus the traditional ones. Additionally, the more familiar they become with the medium, the greater their demands will be.

2.2 Technology Trends

In the technologically mature markets, eTourism is a reality, and the involvement of the traditional media with the Internet is self explanatory. The separation between online and offline media becomes less and less obvious, in any case the customer doesn't care for that separation. The only thing he wants is to be able to find robust, correctly structured, and easily accessible information, such that he can choose a tourist product that satisfies his needs and desires.

The new technological trends that emerged through the study of the international tourism environment and appear to be related to the implementation of the ADRIATIC-ROUTE WebGIS platform, are the following.

2.2.1 e-Marketing

Electronic marketing consorts with personalized service and aims to attract a share of individual tourists that use the Internet in order to get information about a destination.

E-marketing includes even some naïve methods that increase the user-friendliness of a website e.g. an automated detection of the visitor's country and a welcome message in his language. The same framework comprises search engine optimization techniques for tourist websites as well as sponsored links.

Nowadays, a good ranking of a tourist website in search engines like Google, Yahoo, etc, is the beginning for successful advertising and promotion of a destination. Keep in mind that the increase of web traffic by only a small percentage translates to a large economic benefit.

Finally, e-marketing's cutting edge involves promotional actions which use original and attractive methods with well-designed e-mails, banners and e-cards that arrive at the potential customer - Internet user promoting a destination.

2.2.2 Social Networking & WEB 2.0

E-marketing methods tourism-wide, are supported not only by the aforementioned applications, but also by new media and communication channels like WEB 2.0 applications. In a sense, these applications are tools used for "massive collaboration", allowing Internet users to actively participate and instantly collaborate with other users for the production, extraction and transmission of knowledge via the Web. Indicatively:

- Online magazines and personal Blogs
- Social Networks and Collaborative Networking
- Podcasting websites and online videos
- Tagging feature for highlighting and categorizing information
- Mash-up feature for combining different sources of content and/or software
- Wiki feature for allowing users to outline the available content
- RSS (Really Simple Syndication) feature for allowing direct transmission of information to a Webpage
- Ajax a group of interrelated Web development techniques used on the client-side to create asynchronous Web applications.

How popular these new communication media become is shown by the evidence provided by a Forrester research, according to which:

- 35% of European tourists participate to a social service at least once a month
- 26% at least once a week
- and 10% daily

Therefore, the global tourism industry will focus more and more on Web 2.0, considering the significant impact, that the new collaborative web models have on e-business, as nowadays Internet users and travelers seek the creation and distribution of their own content, via their favorite digital media.

Web 2.0 technologies grant Internet users the privilege to grow into producers, designers, providers and distributors of tourism services as well as become the "intermediate business players" of this newly created e-commerce standard. The enterprising ramifications as well as the opportunities created for tourism are considered very important.

Outlining the most important points:

- The power of impartiality, and the mouth-to-mouth diffusion of electronic information via Blogs, has as a result the advertisement or detraction of a destination or a tourism enterprise with the speed of virus infection. Tourism organization now observe this group conversations and have also incorporated Blogs to their own websites.
- Online social networks and media play a vital role in the way the tourists plan, organize and utilize their travelling experiences. The third-party quality assurance and the mutual trip organization are tendencies that affect significantly the tourism market. Modern websites adjust in order to facilitate and exploit this collaboration, by suggesting urging users to make group reservations.
- The tagging feature is also very important. The information clustering that is provided this way, defines heavily the way other users seek and find the same content over the internet. Tourism businesses study these technological developments since they are directly connected with the optimization of their search engine ranking.

2.2.3 Multimedia & Virtual Reality

This framework includes multimedia and virtual reality techniques and their increasing exploitation in destination management systems.

Multimedia usage in tourism aims to provide enriched information with a variety of ways, and is found in every level, from national tourist sectors to local tourism enterprises.

Video sharing, e-books, virtual and augmented reality, 360° spherical photo – video – objects, gigapixel imaging, 3D reconstructions, 3D animation and ultimately digital storytelling techniques are utilized to achieve state of the art promotion of a destination.

Virtual reality techniques have interesting applications for cultural tourism (e.g. virtual tours for museums as well as for points of historical interest), for getting in touch with nature tourism and for ideal preview of events (e.g. multidirectional 360° video). They can also be utilized with proper extensions like hyperlinks to physical files and as educative means for culture and environment.

2.2.4 Web-GIS

Dynamic digital maps (WebGIS) are particularly used as a part or in combination with other technological trends as mentioned above, like the integrated electronic destination management and m-tourism applications.

They offer topological comprehension to users and access to “how to get there” directions with greater ease. Their main use is, with simple terms, presentation backgrounds for geo-annotated information of any kind and any type.

2.2.5 m-Tourism

The use of mobile platforms in tourism (m-tourism) is one of the most important technological developments in tourism and basic paradigm of a personalized service. m-tourism applications are used mainly for the promotion and management of

alternative forms of tourism, and more specifically ecological tourism (navigations to natural parks, bicycling routes, mountain hiking) as well as city navigation in the form of portable city-guide.

In mobile applications the presence of multimedia and georeferenced services is strong. Applications like portable city guides with features like saving data, scheduling, automatic geolocation, optimized combination and time-scheduling enable users for better management of their visit in cities, museums and sightseeings. m-tourism applications are used for the prolonging of the visitors' stay at their destination. The benefits that come with this are very important, especially for destinations that combine lots of points of interest nearby.

The combination of content preview with multimedia, gps positioning, and location-based services offers new possibilities during vacations. Additionally, promotion of proximity marketing via technologies like Bluetooth, SMS, or even Push Notifications has opened a huge communication channel with the public.

3. USER REQUIREMENTS

3.1. Stakeholders - Users

The following user groups are identified:

- Public

These are the public users of the tourist portal and the mobile applications. They will have view access to the content through the web portal and mobile apps. They will also have access to social features like commenting, recommending, rating, sharing and participating in a digital travel community.
- Project Partners

These are the project partners. They will have full access to the tourist portal including data management of its content.
- Internal Administrators

These are the local administrators of the SDI. They will have full access to the GIS database and server. They will also have full access to the tourist portal application and the mobile applications.
- Internal Data Providers

These are the local spatial data providers. They will have access to the GIS database (insert / update) using the desktop GIS application.

3.2. Requirements

The following requirements have been identified:

- Public
 - View touristic content
 - Search touristic content
 - View the location of the point of interest
 - Get driving directions
 - Interact with digital social features
 - Use the web or a mobile app
- Project Partners
 - Insert touristic content
 - Edit touristic content

- Update touristic content
- Internal Administrators
 - Manage Databases
 - Manage spatial data
 - Manage GIS services
 - Manage metadata
 - Manage touristic content
- Internal Data Providers
 - Provide spatial data
 - Update Spatial database
 - View maps
 - Search spatial data
 - Export spatial data
 - Perform spatial data analysis

4. FUNCTIONAL & TECHNICAL SPECIFICATIONS

4.1 Functional Specifications

The system will have the following functional specifications:

- General:
 - ✓ Web interface
 - ✓ Support for multiple languages
 - ✓ Simple to use interface
- Security:
 - ✓ Role based security. Users may view or manage data based on the granted rights which would be assigned by the system administrator
- Mapping:
 - ✓ Display geographical information in thematic layers
 - ✓ Search functionality for spatial and relation data
 - ✓ Editing of spatial data
- Interoperability:
 - ✓ Support of OGC services (OGC WMS, WFS, WCS, WPS, kml)
 - ✓ Catalog Services (OGC CSW)
 - ✓ Metadata (ISO, INSPIRE)
 - ✓ Data access using web services

4.2. Technical Specifications

4.2.1 Implementation Principles

The system will be based in **n-tier architectural style**. This system architecture provides¹:

- (1) **Maintainability**. Because each tier is independent of the other tiers, updates or changes can be carried out without affecting the application as a whole.
- (2) **Scalability**. Because tiers are based on the deployment of layers, scaling out an application is reasonably straightforward.
- (3) **Flexibility**. Because each tier can be managed or scaled independently, flexibility is increased.
- (4) **Availability**. Applications can exploit the modular architecture of enabling systems using easily scalable components, which increases availability.

4.2.2 System Architecture

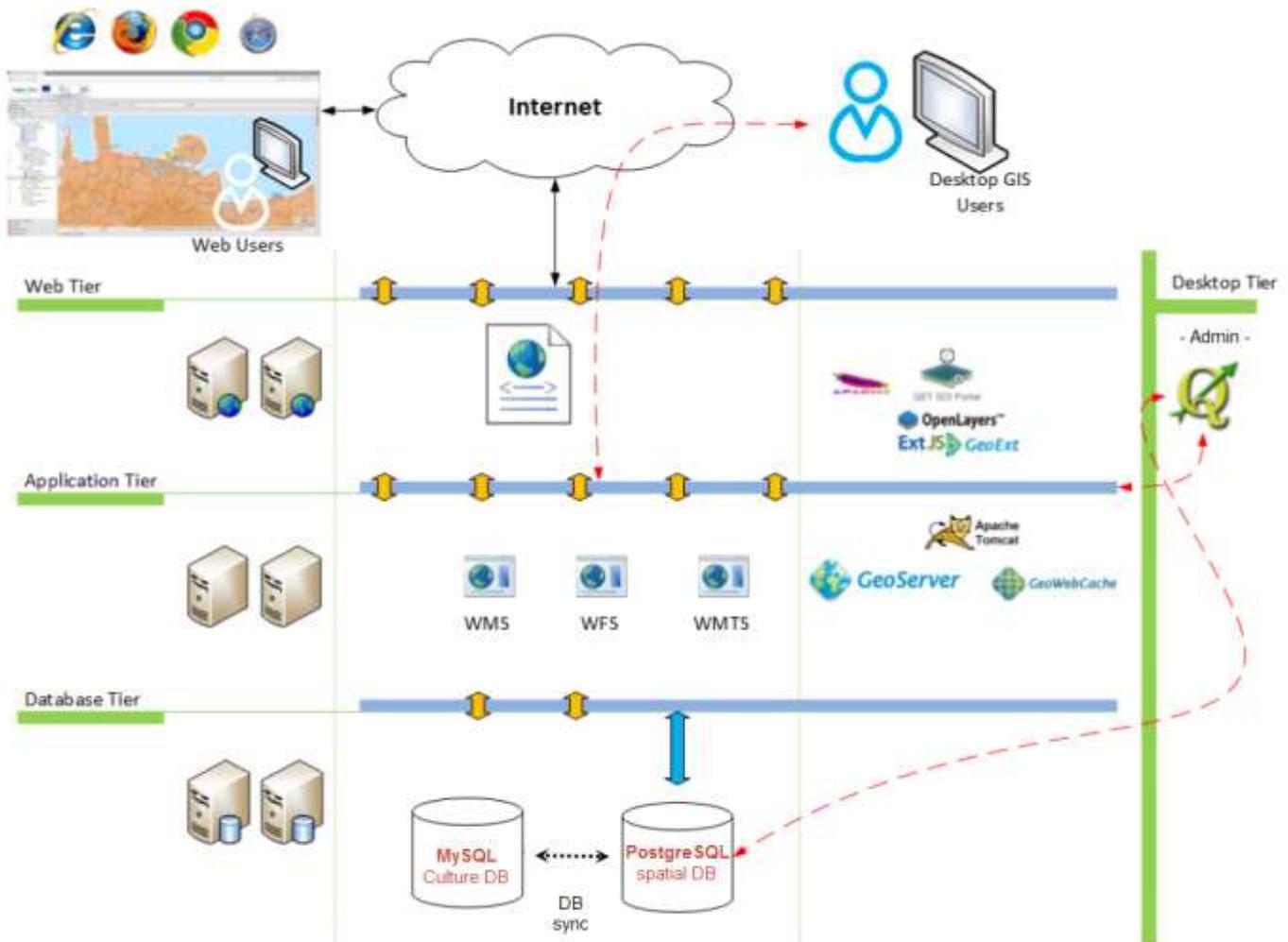
4.2.2.1 Logical Architecture

The proposed system will have the following four tiers:

- **Presentation tier**: This will be the topmost level of the system. The presentation tier will provide the system's user interface (UI). This involves the use of graphical user interface for smart client interaction and web based technologies for browser-based interaction. It will be the layer that users will be able to access directly (web-based applications, mobile applications). The presentation tier is responsible for the user interface of the system that enables data visualization, data manipulation and data entry.

¹ Microsoft Application Architecture Guide – patterns & practices, 2nd Edition

- **Logic tier:** The logic tier comprises the business logic of the system. The logical tier will pull out from the presentation tier and, as its own layer, it will control the application's functionality by performing detailed processing. It will perform the main functions of the system: processing data, implementing business rules, coordinating multiple users, and managing external resources such as databases or legacy systems.
- **Data tier:** The data tier will include the data persistence mechanisms and the data access layer that encapsulates the persistence mechanisms and exposes the data. It will consist of data used by logic tier. This tier will receive information retrieval and manipulation requests expressed using a query language, evaluates the query, and returns a set of data objects that are represented using an information exchange language
- **Desktop Tier:** the tier includes the desktop/back-office applications. While the solution is web oriented, every enterprise GIS system needs a set of powerful and flexible desktop applications, offering automations, ease of use to achieve effective operational capability. The tier includes the offered Open Source Desktop GIS Software (QGIS)



Database

The data collected will be organized and stored in a **spatial enabled database (Data tier)**. This is necessary in order to provide a single and standard way for data retrieval between the different system components and other external components that might interact and exchange information with the system. The Open source spatial enabled RDBMS Postgresql will be used.

GIS services

The access to the spatial data will be performed through standard OGC services (**Logic tier**). For this purpose a **GIS server** will be installed (geoserver) that will provide the necessary services. These are **WMS, WFS, WCS, CSW and WPS**.

WMS will provide access to the data requested mostly from web or mobile applications in the form of images. Time related data can also be handled using the WMS-T extension of the service. WFS and WCS will provide access to the original vector or raster data, with query and export capabilities. CSW will provide catalog services that can be used in order to make the data available to a geoportal or any spatial catalog service application. It will also ensure the proper metadata of the data and the services which is requested and necessary according to the INSPIRE directive. Finally WPS will provide the necessary processing framework that can be used in the analysis of the spatial data.

Metadata will be provided for all datasets derived in this project according to the specifications of the INSPIRE directive. A catalog service will be available so that the data can be included in catalog services applications and be available / used from external systems / users too.

Web-based GIS application

The **web-based GIS application**, with a user-friendly interface, will be an important component of the system (**Presentation tier**). The ultimate goal is to create a web-based application where users interact with spatial (or other) data and analysis tools. It will also display different forms of output to the user based on commands, tools and tasks that are triggered by some client-side and server-side actions and will have business logic associated with them. The application will allow the end-user to manipulate the spatial objects displayed in the map to perform geographic operations and to request processing operations from the system logic tier.

The user-interface will be map-centric and it will follow the latest guidelines of Computer Human Interaction. It will be based on open source tools like GET SDI Portal, openlayers², or GeoExt³ that allows the development of interactive web and mobile applications using the proposed OGC compliant architecture.

² <http://openlayers.org>

System Components

The System Components of the above architecture are:

- Databases
 - Postgresql (Spatial DB)
 - MySQL (Culture DB)
 - DBSync for MySQL and PostgreSQL
- Geoserver
- GeoWebCash
- OpenLayers, Ext.JS, GeoExt
- QGIS

PostgreSQL

PostgreSQL, is an object-relational database management system (ORDBMS) with an emphasis on extensibility and standards-compliance. As a database server, its primary function is to store data securely, supporting best practices, and to allow for retrieval at the request of other software applications. It can handle workloads ranging from small single-machine applications to large Internet-facing applications with many concurrent users. Recent versions also provide replication of the database itself for availability and scalability.

PostgreSQL implements the majority of the SQL:2011 standard, is ACID-compliant and transactional (including most DDL statements) avoiding locking issues using multiversion concurrency control (MVCC), provides immunity to dirty reads and full serializability; handles complex SQL queries using many indexing methods that are not available in other databases; has updateable views and materialized views, triggers, foreign keys; supports functions and stored procedures, and other expandability, and has a large number of extensions written by third parties. In addition to the possibility of working with the major proprietary and open source databases, PostgreSQL supports migration from them, by its extensive standard SQL support and available migration tools. And if proprietary extensions had been used, by its extensibility that can emulate many through some built-in and third-party open source compatibility extensions, such as for Oracle.

³ <http://geoext.org>

PostgreSQL is cross-platform and runs on many operating systems including Linux, FreeBSD, Solaris, and Microsoft Windows. Mac OS X, starting with OS X 10.7 Lion, has the server as its standard default database in the server edition, and PostgreSQL client tools in the desktop edition. The vast majority of Linux distributions have it available in supplied packages.

PostgreSQL is developed by the PostgreSQL Global Development Group, a diverse group of many companies and individual contributors. It is free and open source software, released under the terms of the PostgreSQL License, a permissive free software license.

PostGIS is an open source software program that adds support for geographic objects to the PostgreSQL object-relational database. PostGIS follows the Simple Features for SQL specification from the Open Geospatial Consortium (OGC).

MySQL

MySQL is (as of July 2013) the world's second most widely used relational database management system (RDBMS) and most widely used open-source RDBMS. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation.

MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack (and other 'AMP' stacks). LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python." Free-software-open source projects that require a full-featured database management system often use MySQL.

DBSync

DBConvert for MySQL and PostgreSQL is a reliable database converter performing data migration from MySQL to PostgreSQL and in opposite way.

GeoServer

The mapping services, View and Download will be implemented using the FOSS **Geoserver** (latest stable release 2.2.2, 2102-11-23). GeoServer is considered as one

of the most advanced map-servers, while constitutes the reference implementation for the WFS standard.

GeoServer main features include:

- support of OGC standards WMS, WFS, WFS-T, WCS,
- data publishing from the most popular (commercial and FOSS) RDBMSs, namely like MS SQL PostgreSQL/PostGIS, MySQL, Oracle Spatial, ESRI ArcSDE, as well as file-based geospatial data formats (e.g. ESRI shapefile, Vector Product Format, MapInfo MIF/MID, TIFF, GeoTIFF, BigTIFF, GTOP030, ECW, MrSID and JPEG2000).
- Map publishing is supported in JPEG and PNG formats, with SLD support integrated.
- support of coordinate reference systems specified in the EPSG database
- dynamic CRS transformations.
- support of data export in various formats such as
 - Shapefile,
 - KML,
 - GML,
 - PDF,
 - JPEG.

GeoWebCache

To improve system's overall performance and effective management of resources, a software package for management and caching tiles of maps available through the View Service (WMS).

The software offered is the FOSS GeoWebCache (latest stable version 1.2.6, 2011-04-19) and will be used to pre-compute map-tiles for the datasets whose content is 'static'.

The software has the ability to act as a proxy between the clients and GeoServer. If a map-tile exists, GeoWebCache serves the pre-computed tile, increasing performance and user experience. Otherwise, GeoWebCache sends the request to GeoServer to produce on the fly the tile.

Openlayers

OpenLayers is an open source (provided under the 2-clause BSD License) JavaScript library for displaying map data in web browsers. It provides an API for building rich web-based geographic applications similar to Google Maps and Bing Maps. The library was originally based on the Prototype JavaScript Framework.

OpenLayers supports GeoRSS, KML (Keyhole Markup Language), Geography Markup Language (GML), GeoJSON and map data from any source using OGC-standards as Web Map Service (WMS) or Web Feature Service (WFS).

Ext.JS

Ext JS is a pure JavaScript application framework for building interactive web applications using techniques such as Ajax, DHTML and DOM scripting.

Originally built as an add-on library extension of YUI by Jack Slocum, Ext JS includes interoperability with jQuery and Prototype. Beginning with version 1.1, Ext JS retains no dependencies on external libraries, instead making their use optional.

GeoExt

GeoExt is a Javascript Toolkit for Rich Mapping Applications. GeoExt brings together the geospatial know how of OpenLayers with the user interface savvy of Ext JS to help you build powerful desktop style GIS apps on the web with JavaScript. GeoExt is Open Source and it is available under the BSD license and is supported by a growing community of individuals, businesses and organizations.

QGIS

QGIS (previously known as "Quantum GIS") is a cross-platform free and open-source desktop geographic information system (GIS) application that provides data viewing, editing, and analysis capabilities.

Similar to other software GIS systems QGIS allows users to create maps with many layers using different map projections. Maps can be assembled in different formats and for different uses. QGIS allows maps to be composed of raster or vector layers. Typical for this kind of software the vector data is stored as either point, line, or polygon-feature. Different kinds of raster images are supported and the software can perform georeferencing of images.

QGIS provides integration with other open-source GIS packages, including PostGIS, GRASS, and MapServer to give users extensive functionality. Plugins, written in

Python or C++, extend the capabilities of QGIS. Plugins exist to geocode using the Google Geocoding API, to perform geoprocessing (fTools) similar to the standard tools found in ArcGIS, and to interface with PostgreSQL/PostGIS, Spatialite and MySQL databases.

QGIS runs on multiple operating systems including Mac OS X, Linux, UNIX, and Microsoft Windows. QGIS has a small file size compared to commercial GIS's and requires less RAM and processing power; hence it can be used on older hardware or running simultaneously with other applications where CPU power may be limited.

4.2.2.2 Physical Architecture

The system will be implemented in one (1) Virtual Machine.

The VM will act as the database and application / web server and will have Linux OS, Postgresql, MySQL, Apache Tomcat and Geoserver installed.

It will also host the web applications (Web Touristic Portal and Spatial Data Infrastructure Portal) .

The internal users will be able to interact with the system using their workstation computers. QGIS will be installed in these computers in order to allow users to have direct access to the system spatial database.

4.2.3 Applications

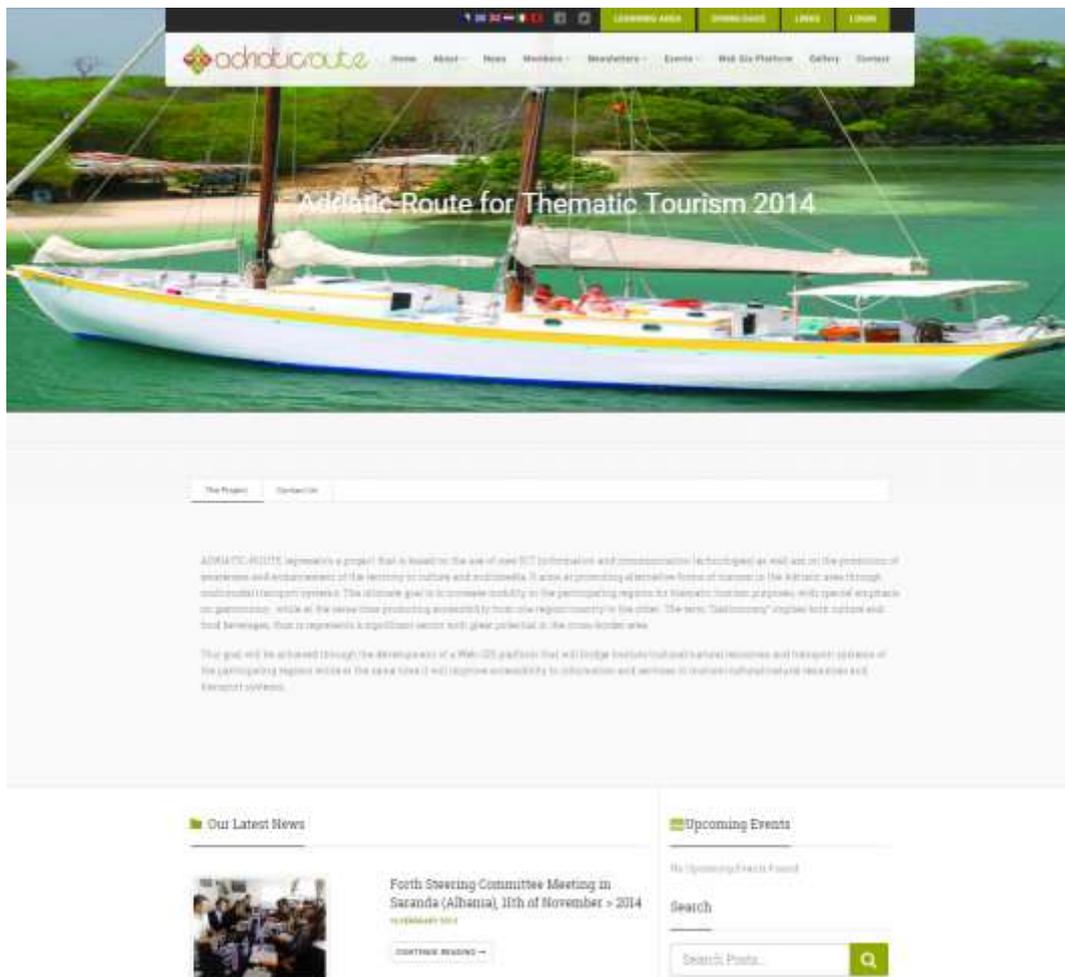
4.2.3.1 Project Website

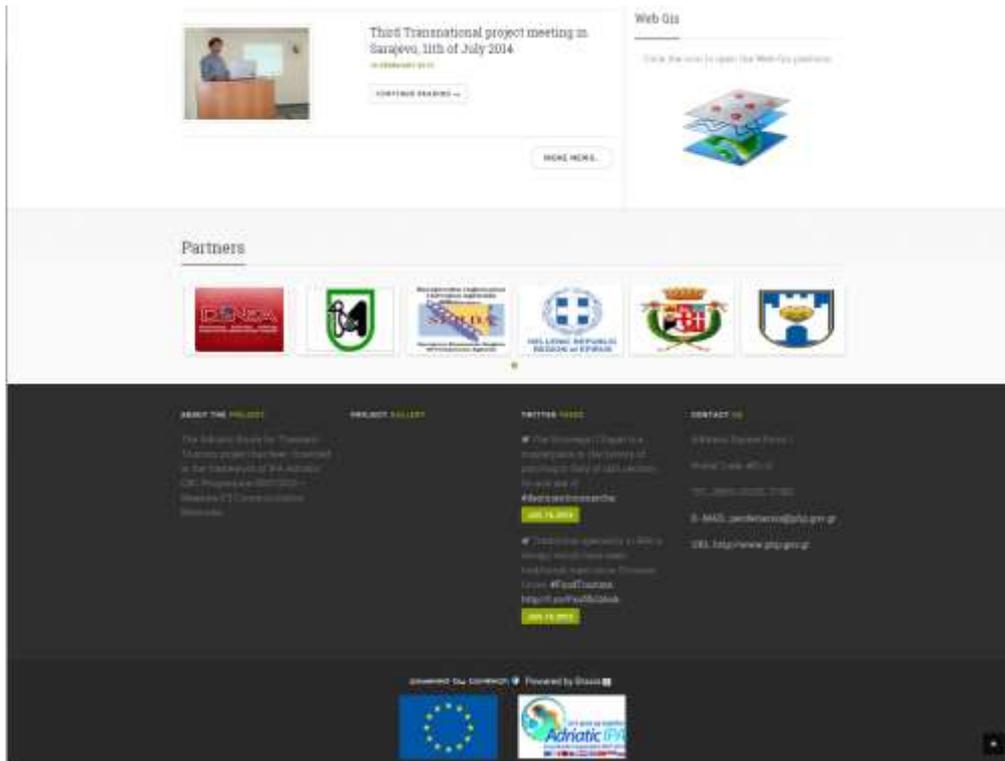
4.2.3.1.1 Domain Name

The ADRIATIC-ROUTE project website is available via the following url:
<http://www.adriatic-route.com/>

4.2.3.1.2 Home Page & Website Sections

The home page is the landing point of all visitors and provides access to all sections of the project website.





The website provides access to the following sections

1. About the Project



2. News

3. Members of the consortium

4. Newsletters with a flipping book



5. Events



Adriatic Route Meeting and Conference (April 21-22 2015, Province of Padua Headquarters – Antenore Square, 3 – Padua)

- April 21-22 2015, Province of Padua
Headquarters – Antenore Square, 3 – Padua
- Tuesday 21st April – Project meeting**
- 15:00 – 15:15 Registration
 - 15:15 – 18:00 Short project meeting
 - Review of the work done so far and short presentations for deliverable status (LS – all)
 - Spending forecast and procurement plan of all partners (LI)
 - 18:00 – 18:30 Questions and Answers and discussion between partners
 - 19:30 – 21:00 Dinner

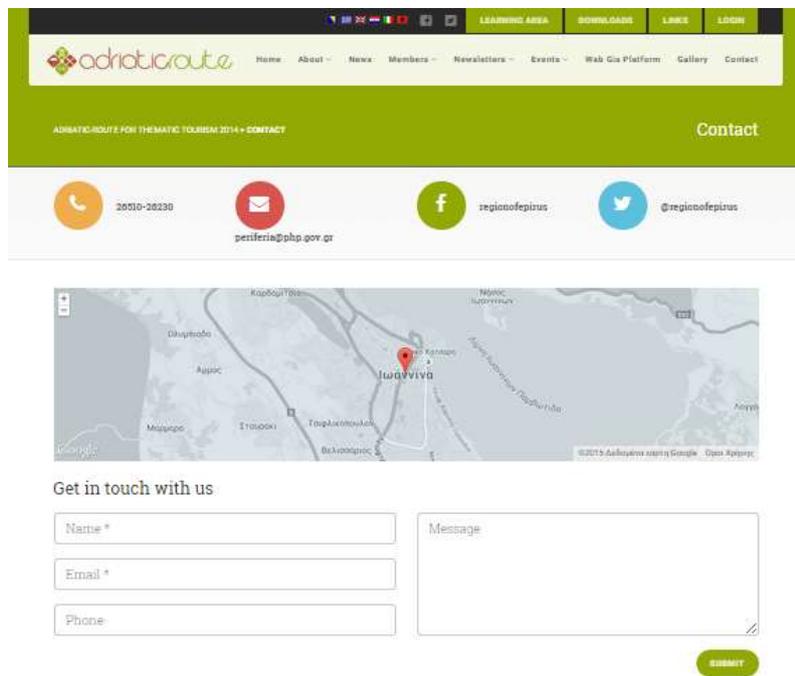
6. WebGIS Platform

This section is presented thoroughly in a following chapter.

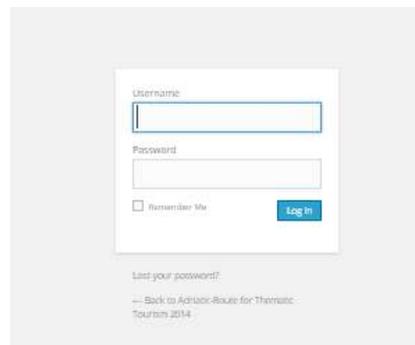
7. Gallery



8. Contact Form



9. Login



Finally, during the training phase there will be access to the Learning Area and the e-learning environment as described in Chapter 7. Training.

4.2.3.1.3 Languages

The public area of the website is available in six languages, and more specifically in Greek, Italian, Albanian, Croatian, Bosnian and English. The private area will be available in English language. The administrator's area will be available only in English.

Visitors will be able to change language in the frontend using the language switcher block. By default, the English text will appear if a translation is missing.

4.2.3.1.4 Content Management System (CMS)

The development of the project website is based on WordPress CMS. WordPress is an open-source blogging tool and a content management system (CMS) based on PHP and MySQL. Features include a plugin architecture and a template system. WordPress was used by more than 23.3% of the top 10 million websites as of January 2015. It is the most popular blogging system in use on the Web, at more than 60 million websites.

Content management is based on an English interface. Translations to / from all languages of the project will be performed in the same page using the language switcher block. By default, the English text will appear if a translation is missing. The content that is integrated in the website will have different forms such as presentations, text, word files, pdf files, links, excel files, audio and video files, html files etc.

4.2.3.1.5 Website Management

The website will be managed by administrator users who will be defined during setup. Defaults can be edited during setup or globally accepted. The platform can be modified by a robust Site administration block. Content may be edited using a built-in

web-based editor (**WYSIWYG**). The administrator role encompasses every possible task that can be performed within the online platform that can be performed within a Network of virtual WordPress site.

Administrators have the ability to:

- Manage the access and level of responsibility of all users on all sites on your network
- Manage network and site features including access to plugins, themes and privacy settings
- Create new users.
- Add new content
- Edit posts, pages, comments on any site without being added as a user to the site
- Publish content added by other users
- Reset passwords and change users' profile details
- Access all the Super Admin menu items via the Network Admin dashboard

4.2.3.1.6 User Management

The goal is to reduce administrator involvement to a minimum, while retaining high security. Moreover it supports a range of user authentication mechanisms through plug-in authentication modules, allowing easy integration with existing systems.

4.2.3.2 WebGIS Tourist Portal

4.2.3.2.1 Introduction

The main functional characteristics of the WebGIS Platform for Thematic Tourism are the following:

1. It will manage and properly present via a web interface groups of georeferenced multimedia content that will provide answers to following questions that tourists usually have
 - a. Where to go
 - b. How to get there
 - c. Why visit a POI
 - d. What to see
 - e. Where to find it
 - f. What to eat
 2. It will address the needs of:
 - a. Individual Internet Users (tourists, etc.)
 - b. Travel Agencies
 - c. International Tourist Agencies
 - d. Social Media
 3. It will provide the following:
 - a. Web Portal with pages formed by specific templates properly presented to PCs and mobile devices
 - b. Spatial enabled web services based on international standards such as Open Geospatial Consortium, Inspire, etc.
 - c. Spatial enabled social media applications
 4. It will provide the following sub-systems:
 - a. Theme and template management for presentation of thematic tourism content. With the exploitation of these templates the information will be standardized in order to be acceptable at all levels of users.
 - b. Content Management, as it is described in following chapter
 - c. Management of spatial enabled web services
 - d. User administration
-

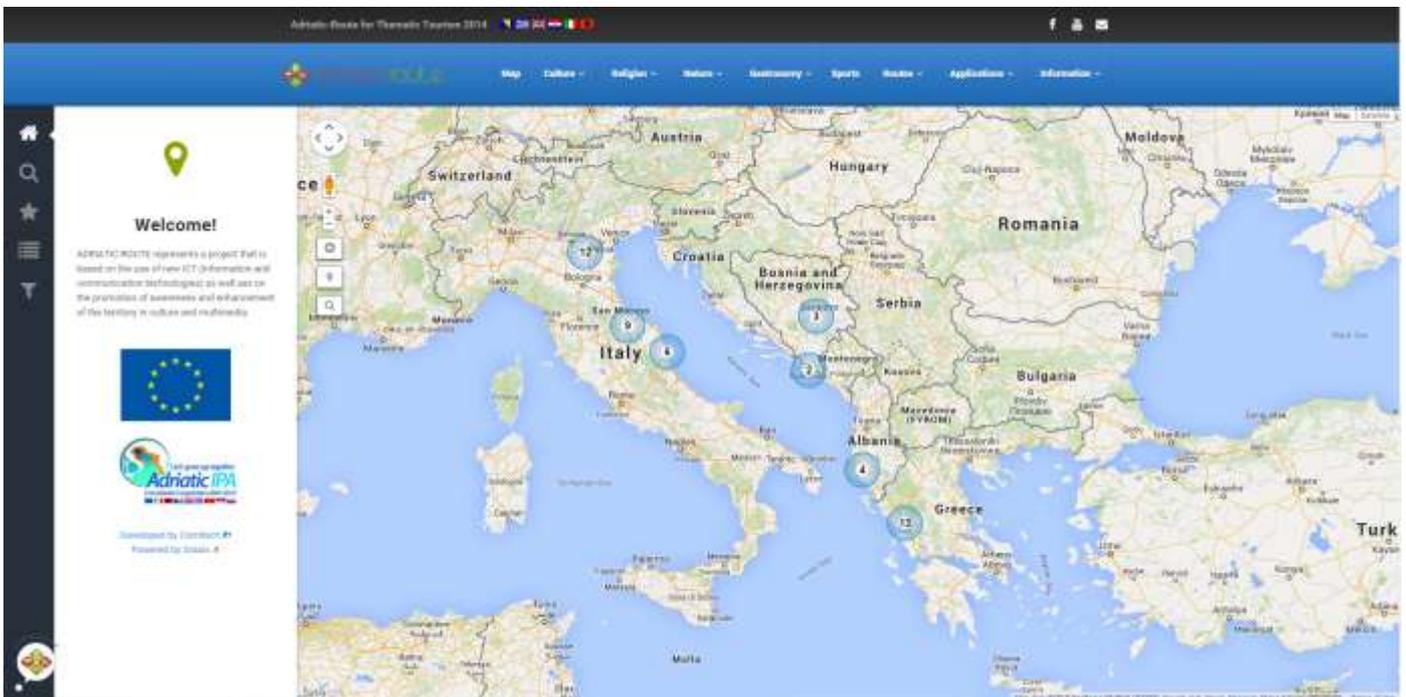
5. It will be delivered with data provided by all partners. The data must include information on local gastronomy and local thematic routes.

4.2.3.2.2 URL

The ADRIATIC-ROUTE WebGIS platform is available under the main project domain name via the following url: <http://www.adriatic-route.com/webgis>

4.2.3.2.3 The Platform

The home page is the landing point of all visitors and provides access to all features of the WebGIS platform.



The home page can be divided in three main sections, each one providing access to different types of functionality and interaction.

The **first section** is the upper one. It enables the user to change the language of the platform, 6 languages are available and the consortium must take care of providing certified translations of the content. A Google translate plugin will be added

next to them in order to facilitate access to automatically translated content to a wide range of languages.



Additionally, it provides access to project's social media profiles and contact forms.

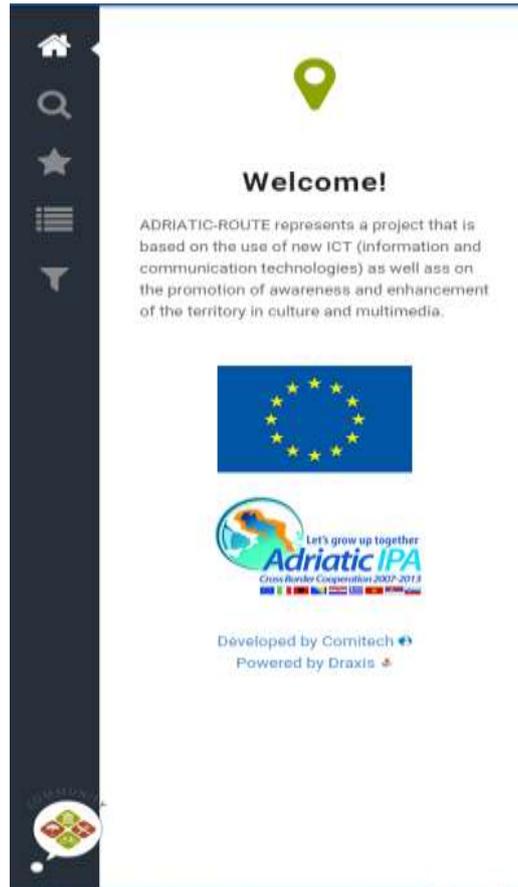


However, the main feature of this section is the menu bar which has been structured based on the types of thematic tourism that the project has identified as significant for the participating areas. These are Culture, Religion, Nature, Gastronomy and Sports. On a second level, the user can select on of the six (6) participating areas in order to get access to local information.

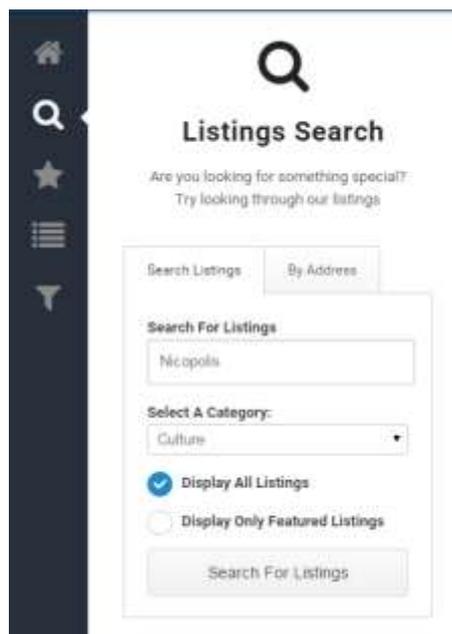
Furthermore, the menu bar provides access to the interactive Map, the suggested Routes, the mobile Applications that are going to be developed and an Information section for each area.

The **second section** is the left one. It consists of six (6) elements that enable the user to interact with the map and get the required information. It is an alternative way of the menu bar for accessing data and represent them on the interactive map.

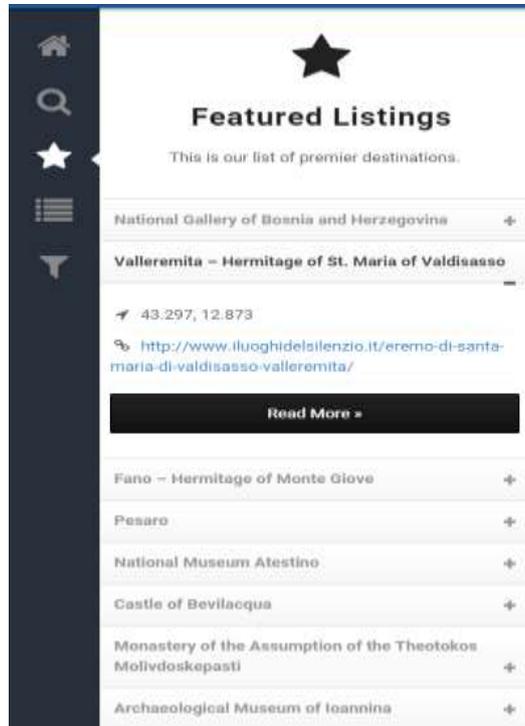
The first one provides a welcome message that can be enriched with helpful instructions on how to use the platform.



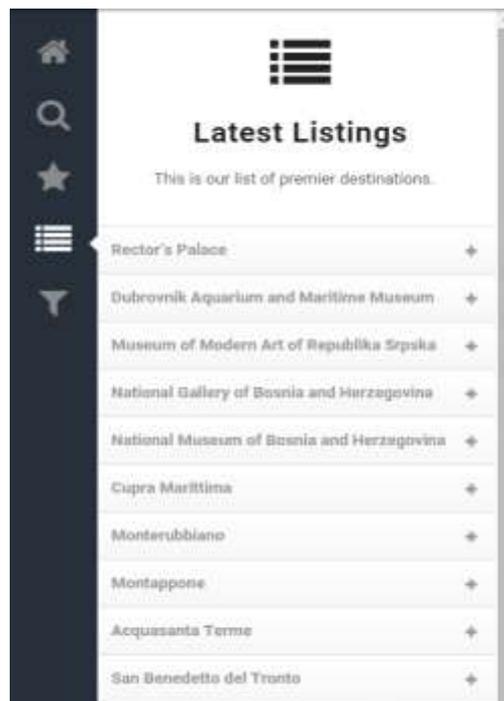
The second element is Search, that enables the user to search the available Points of Interest or to search for a specific Address on place on the map.



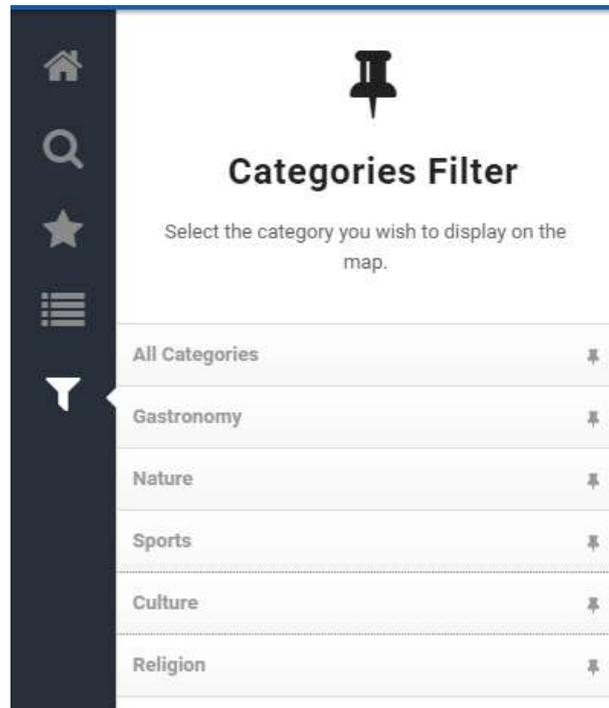
The next one is an element that provides quick access to the listings that have been identified as “featured” or “must see” by the administrators.



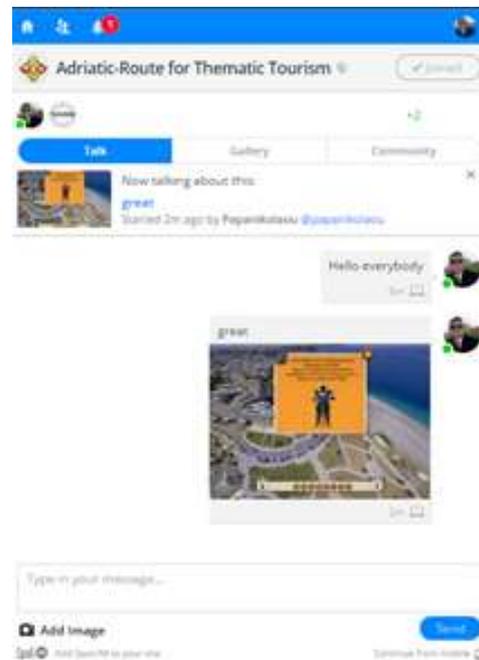
The fourth element is the one that provides quick access to the latest POIs.



The fifth element gives access to a filter mechanism that enable the user to select a parameter and display on the map the requested results.

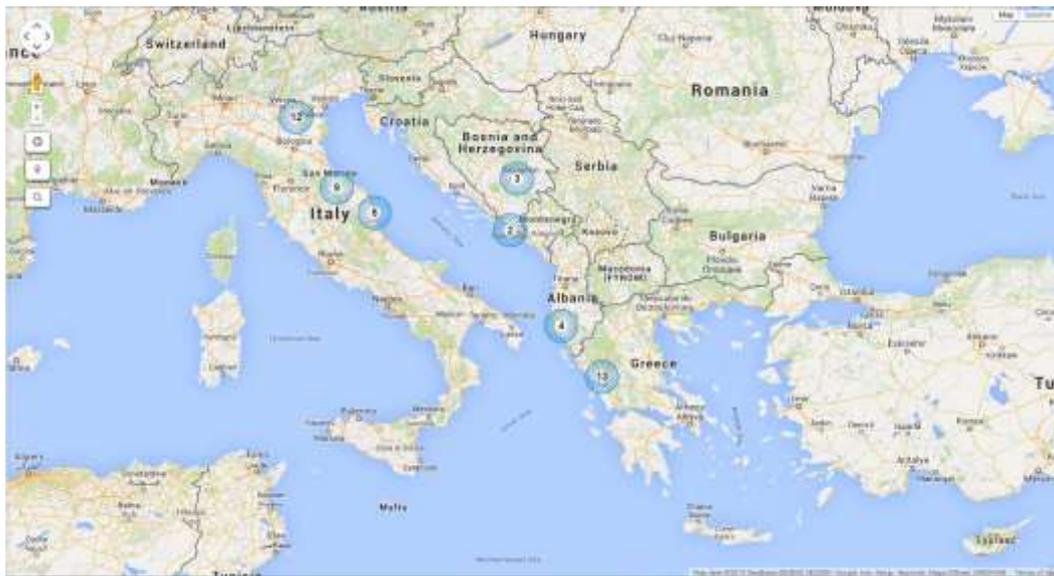


The final element of this section is the AdriaticRoute Community where any user can join with an available social media profile.

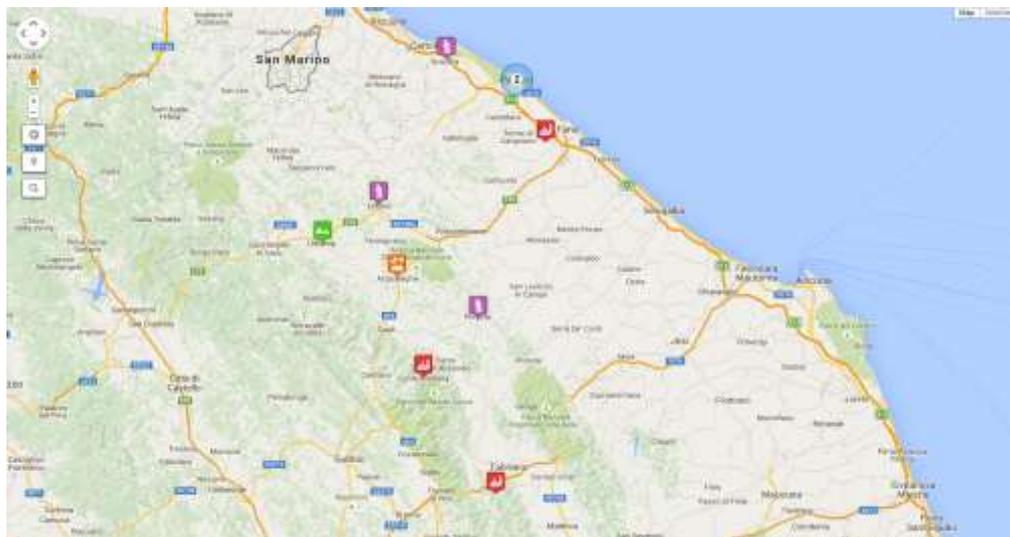


This feature enables users that have joined and are online to interact via text messages, photos and web links. It is expected that with this tool the users will engage in conversations about the area and the available POIs.

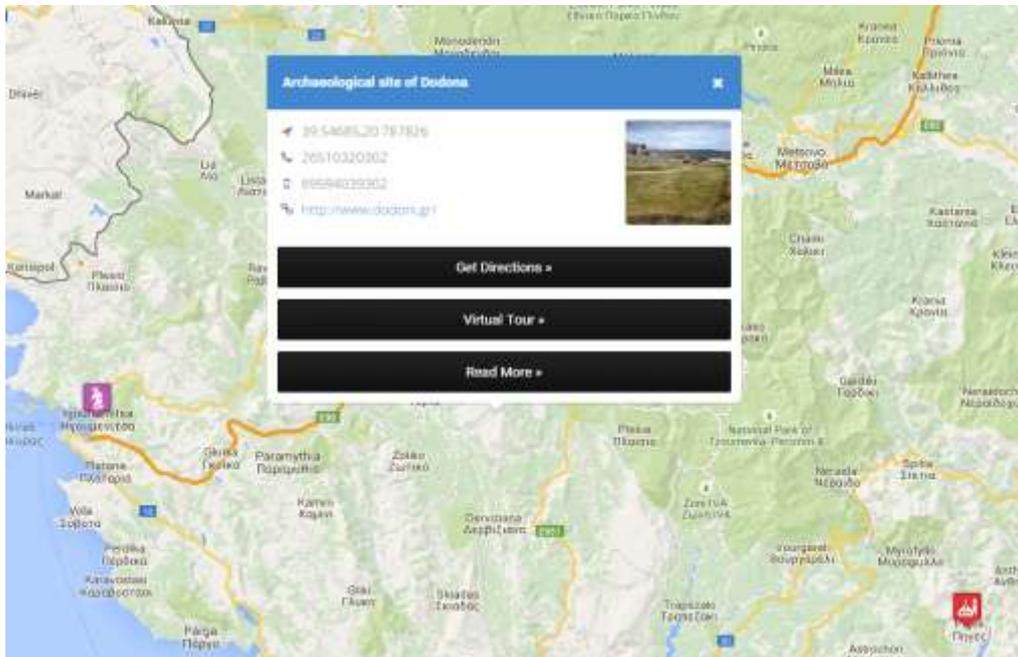
The **third section** is the interactive map. On this map all the available POIs are displayed. The user can interact with the map, move around and zoom in or zoom out in order to get local information.



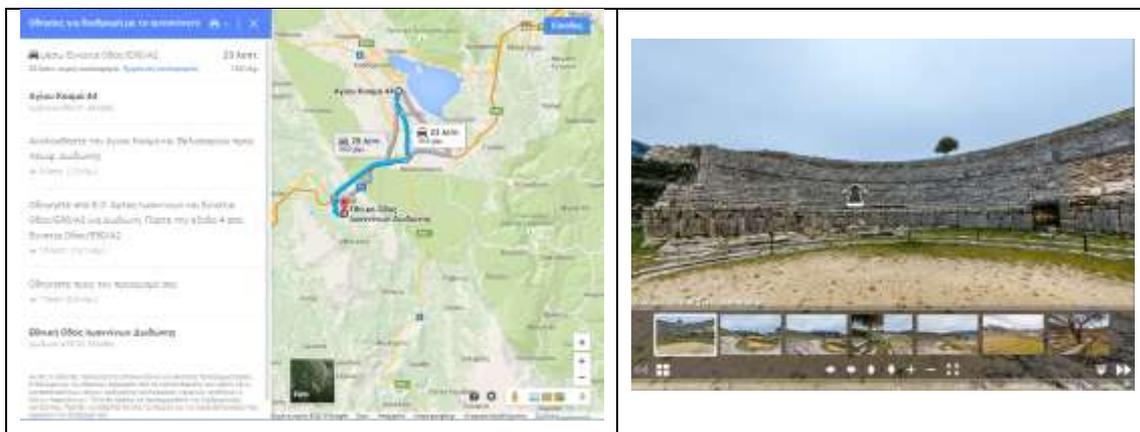
As the user zooms in the POIs are displayed separately and identified by a marker, different for each type of thematic tourism.



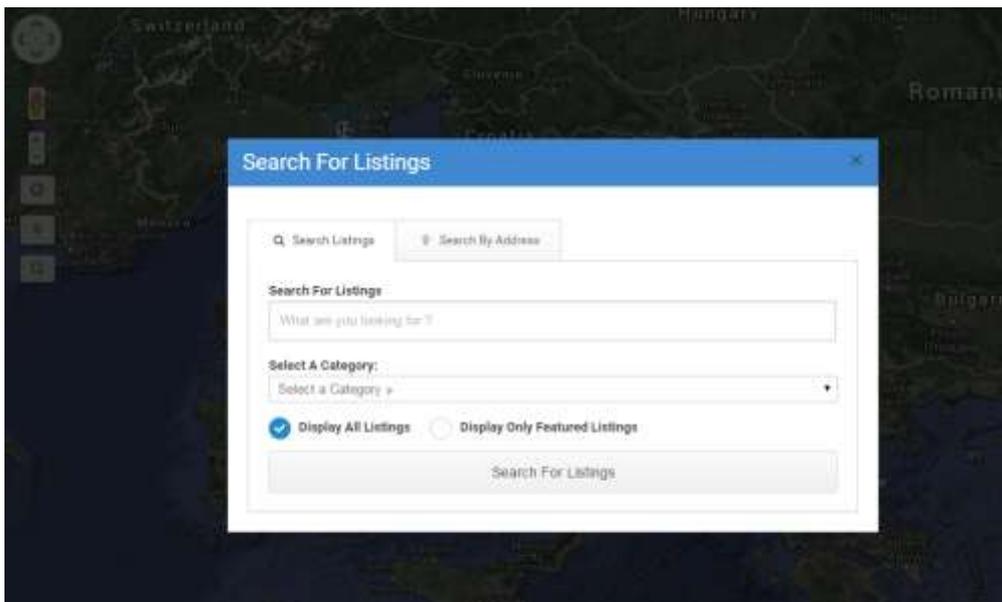
By clicking on POI's marker the user can get access to related information.



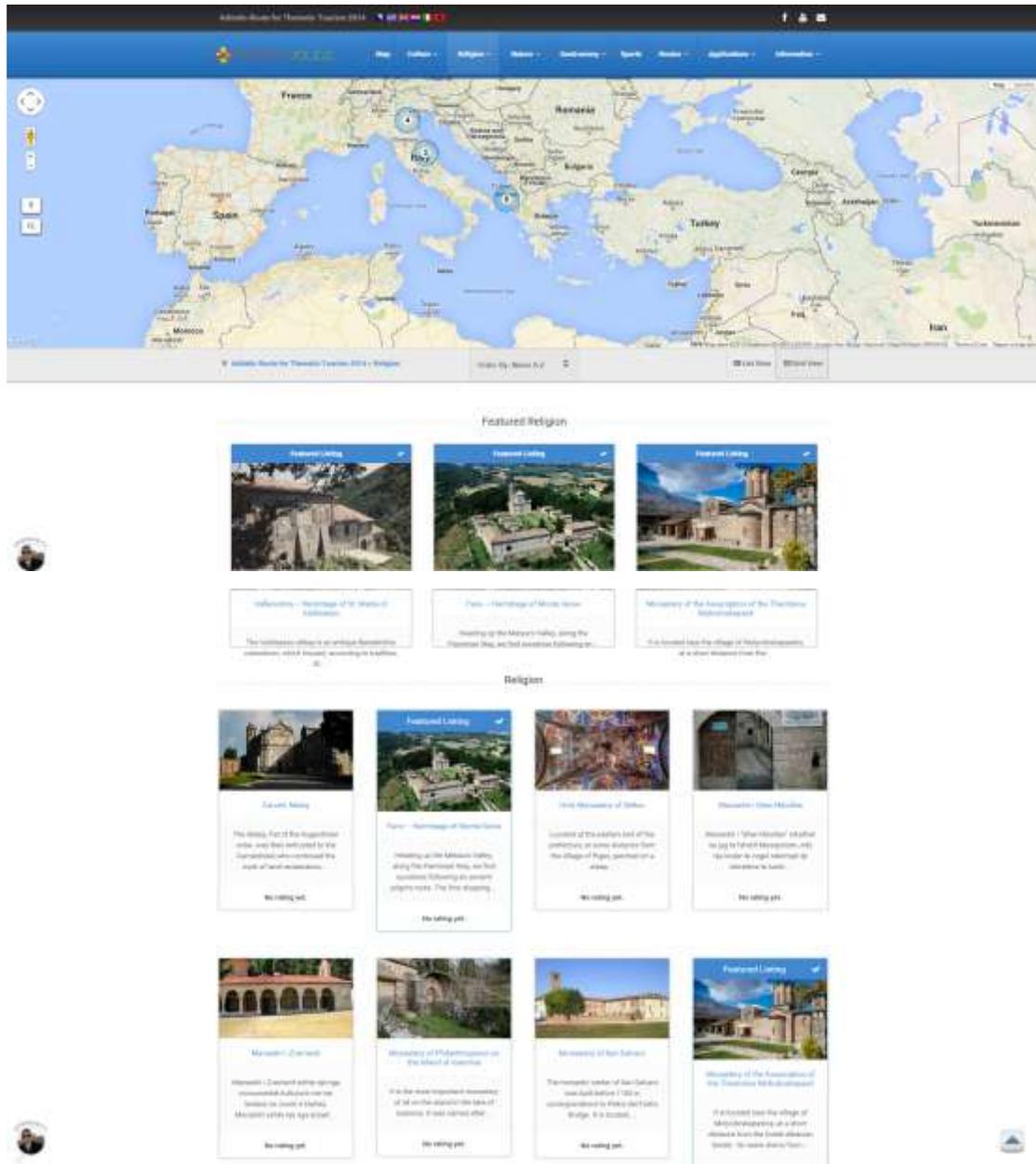
The user can Get Directions to the specific POI, view a virtual tour (if available) and go to the full article presenting all related content.



Furthermore, the user can switch between map view or satellite view, get access to Google Streets panoramic imagery, enable geolocation in order to identify his/her location and search for listings.

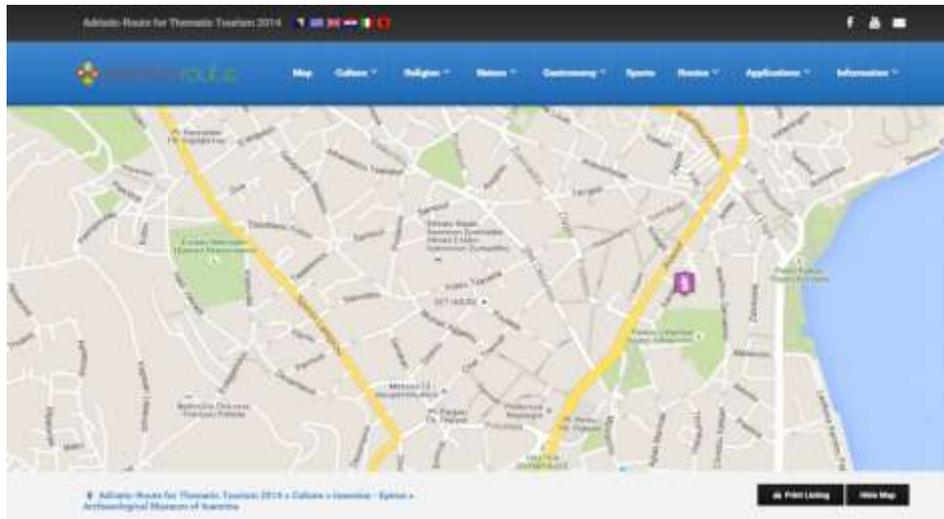


When the user clicks on an item (type of thematic tourism) from the menu bar all the POIs under this category will be presented on a map, and as a list or grid view. The user can sort the listings by Name A-Z, Uploading time or present only the featured ones.



By selecting a POI either on the map or the grid view above the user gets access to the full article presenting all the available content as well as additional functionality. The content types available for each POI is text, photos, virtual tours, videos, contact details and other online resources.

Furthermore, the user can print the listing, view its location on a map, get directions, send it to a friend, share the article via a wide range of social media accounts, submit a review - rate the POI and see the reviews of other users.



Featured Listing Archaeological Museum of Ioannina

Rating - Not Rated Yet 45 Views



Contact Details

Address: Katsarou, Ioannina 452 21, Greece
GPS: 39 566725,20 295923
Phone: 26510320302
Mobile Phone: 994988398291
Website: <http://www.anno.gr>

Other Information

www.anno.gr
ioannina.culture.gr

Get Directions

It is located in a prominent position on the hill called Uluhanlar, in the center of the city of Izmir.

The collections of the Archaeological Museum are displayed in seven halls, the central one and three others, covering a total area of 1,200 square meters.

Excavations cover a wide time span, from the first appearance of humans in Epina during the Lower Paleolithic, 250,000 years ago, to late antiquity in late Roman times (3rd century AD).

Great emphasis is laid on the artifacts from the sanctuary of Dodona, which are exhibited in a hall devoted to one of the greatest sanctuaries of the Greek world.

The new permanent exhibition retains the Panoprotic dimension of the old one and contains approximately 2,000 artifacts from all over Epina.

It is structured around three different axes: chronological, geographical and thematic.

These determined axes underline the museum's sensitive in an attempt to highlight the area's distinct character and history during antiquity.

Virtual Tour



1300s



Share on:

There are 0 reviews. [Add your review](#)

Konstantinos Papadopoulos 3 July 2015
 Four comments awaiting moderation

 Great place, must visit for everyone

[Submit A Review](#)

Name

Email

Where

★★★★★

Set Directions

From:

To (optional):

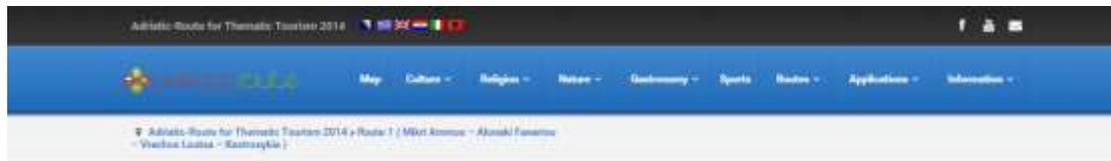
Travel Mode: Driving Bicycling
 Public Transport Walking

To:

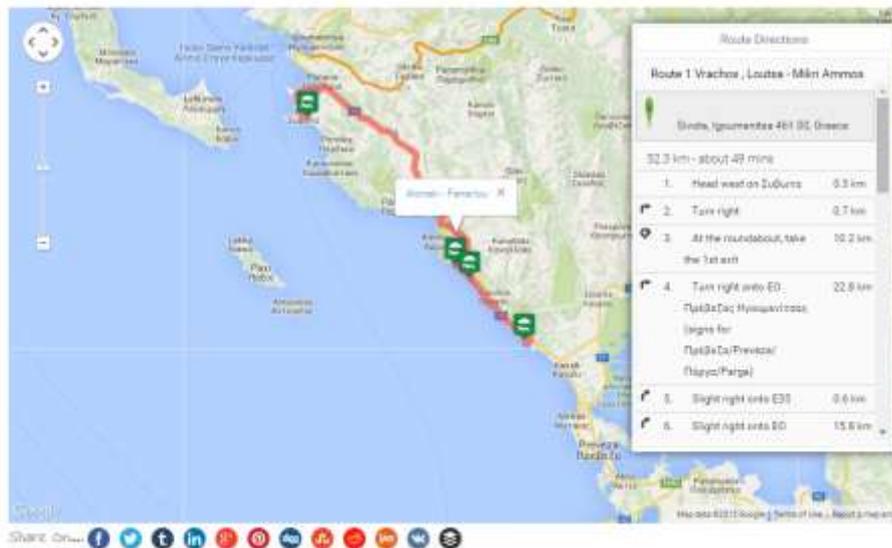
From:

Message:

Finally, through the platform the user can access to suggested routes in the participating areas with detailes directions on how to get to each POI.



Route 1 (Mikri Ammos – Alonaki Fanariou – Vrachos Loutsas – Kastrosykia)



4.2.3.2.4 Languages

The WebGIS interface is multilingual. The system will be able to display the entire interface, and Articles automatically in all languages to be supported (without them been translated by the author) through appropriate plugins that will take advantage of the widespread Google application.

Additionally, the system will enable the author to translate the content of an article at the supported languages.

Automatic translation will be used by the system only for articles without translated content under the requested language. In that case the user will be informed that this is an automated translation.

The public area of the platform will be available in six languages, and more specifically in Greek, Italian, Albanian, Croatian, Bosnian and English. For this languages the administrators will be able to insert verified translated content.

The private area as well as the administrator's area will be available only in English.

Visitors will be able to change language in the frontend using the language switcher block. By default, the English text will appear if a translation is missing.

4.2.3.2.5 Content Management System (CMS)

The development of the platform is based on WordPress CMS. WordPress is an open-source blogging tool and a content management system (CMS) based on PHP and MySQL. Features include a plugin architecture and a template system. WordPress was used by more than 23.3% of the top 10 million implementations as of January 2015. It is the most popular blogging system in use on the Web, at more than 60 million websites.

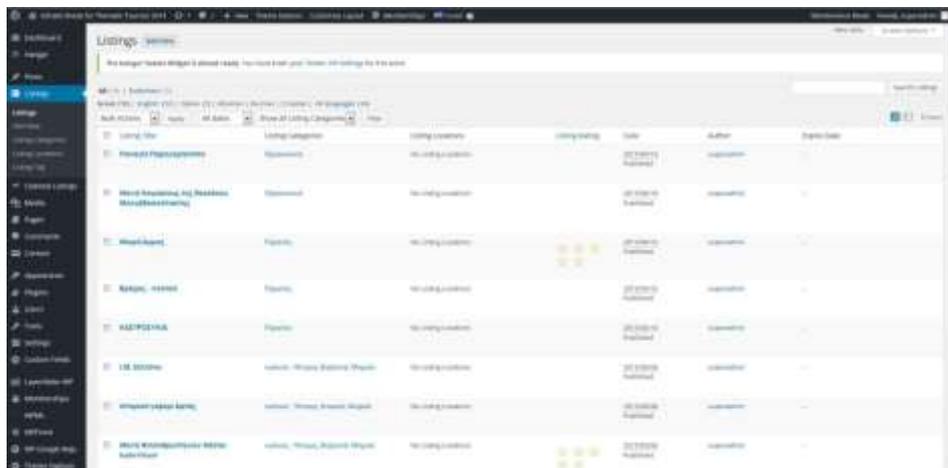
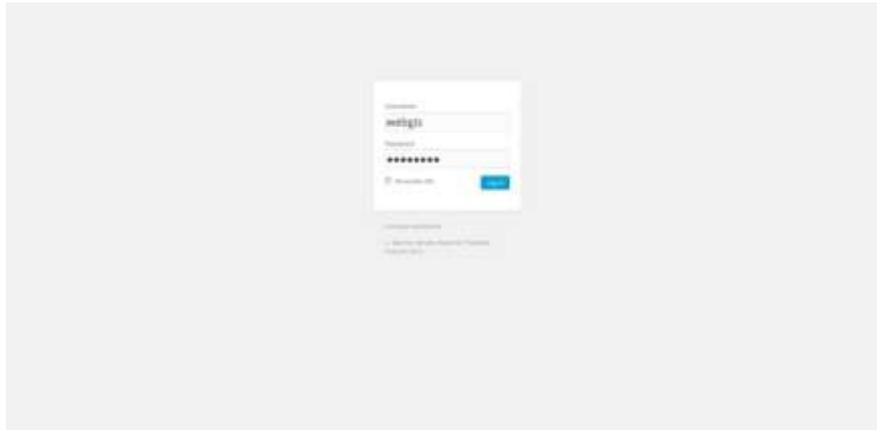
Content management is based on an English interface. Translations to / from all languages of the project will be performed in the same page using the language switcher block. By default, the English text will appear if a translation is missing.

The platform will be managed by administrator users who will be defined during setup. Defaults can be edited during setup or globally accepted. The platform can be modified by a robust administration block.

Content may be edited using a built-in web-based editor (**WYSIWYG**). The content that is integrated in the platform will have different forms such as presentations,

text, word files, pdf files, links, excel files, images (jpeg, tiff, bmp, png), audio (mp3, wav) and video files (mpeg, avi), html files etc.

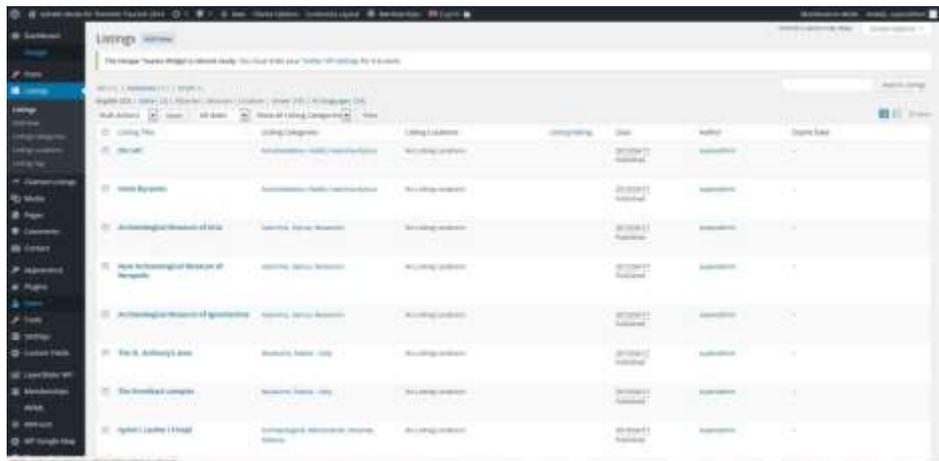
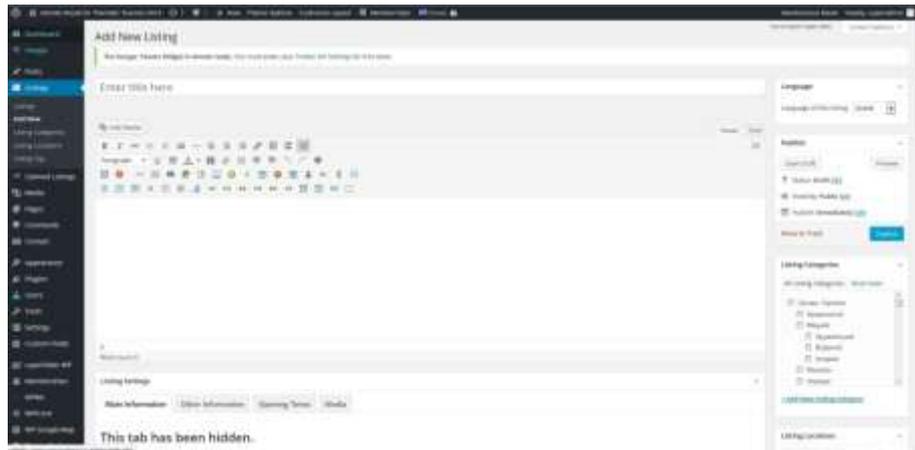
The administrator role encompasses every possible task that can be performed within the online platform that can be performed within a Network of virtual WordPress site.

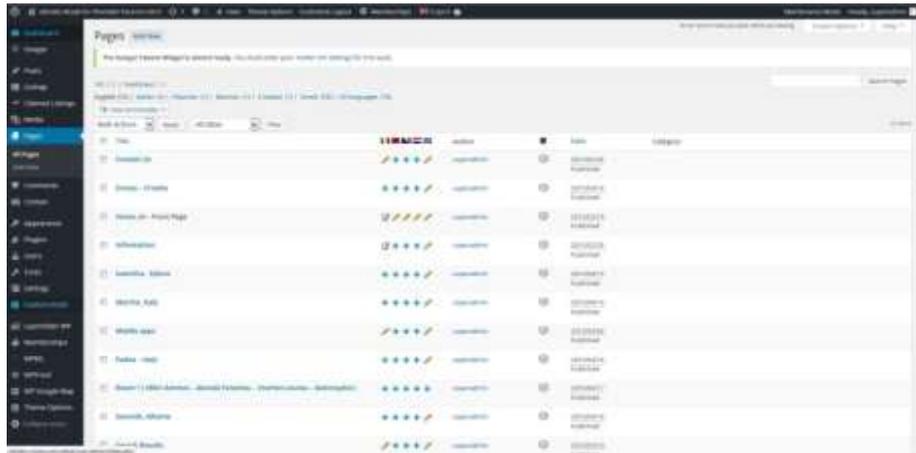


Administrators have the ability to:

- Manage the access and level of responsibility of all users
- Manage network and site features including access to plugins, themes and privacy settings
- Create new users
- Add new content

- Edit posts, pages, comments on any site without being added as a user to the site
- Publish content added by other users
- Reset passwords and change users' profile details
- Access all the Super Admin menu items via the Network Admin dashboard





4.2.3.2.6 User Management

The goal is to reduce administrator involvement to a minimum, while retaining high security. Moreover it supports a range of user authentication mechanisms through plug-in authentication modules, allowing easy integration with existing systems.

4.2.3.3 Mobile Tourist Application

Three (3) native mobile applications for smart-phones and tablets will be developed. They will be available to devices running on iOS, Android and Windows Mobile.

4.2.3.3.1 Technologies

In order to develop the AdriaticRoute Tourist Guide mobile apps we will exploit the technologies presented in the following table.

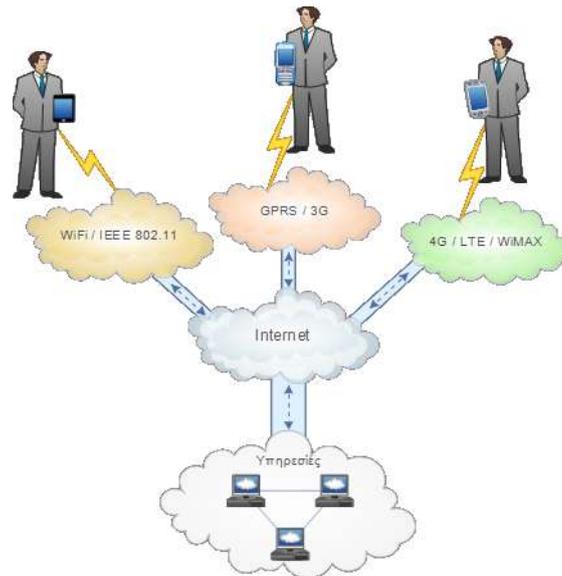
Device	OS	Tools
Smartphone - Tablet	Apple iOS	Objective C Xcode IDE iOS SDK
	Android	JAVA Eclipse IDE with ADT plugin Android SDK
	Windows Phone	C# Windows Phone SDK Visual Studio Express for Windows Phone Blend for Visual Studio

4.2.3.3.2 Content Management System (CMS)

The content of the AdriaticRoute Tourist Guide mobile apps will be managed by a CMS. The CMS will be common for both the mobile apps and the WebGIS application for Thematic Tourism. The data, the structure of the content, the selected Points of Interest can be edited, updated, enriched or deleted dynamically without any restrictions. When a change occurs the mobile apps will be updated and the POIs list as well as their content will be updated with the JSON files generated by the CMS.

4.2.3.3.3 Access to Content

The AdriaticRoute Tourist Guide will be designed as online application, exploiting the modern telecommunications technologies to provide constantly updated information. The transfer of data will be done via Internet so it will be able to exploit the majority of existing and future communication networks. The following figure illustrates the networks exploited by the apps.



Administrators will be able to update the databases through the CMS with new content and the data will be present on the users' devices, automatically after the updating process.

4.2.3.3.4 Features

The features available are the following

- Selection of area. The user will be able to choose one (1) of the six (6) participating areas
- Multilingual User Interface. The user will select the preferred language and the related content will be downloaded. Six (6) languages will be available (English, Greek, Italian, Croatian, Bosnian and Albanian).
- After the selection of the preferred area and language the related content will be downloaded and stored locally.

- Online and offline usage
- Online update with new content.
- Interactive online (google maps) and offline Maps (openstreet maps).
- Presentation of POIs on maps.
- Multimedia galleries supporting pinch and zoom.
- Geo-location
- Driving directions from users location to a selected POI.
- Suggested routes and directions.
- Instant phone call or email
- Nearby. Map with POIs around the user.
- Augmented Reality. Exploitation of the device camera image as a background for presenting POIs, orientation, distance and access to related information.
- Social sharing (Facebook, Twitter, etc.)
- Ability to receive Push Notifications with useful information or alerts

4.2.3.3.5 Content Types and Functionality

The content presented through the AdriaticRoute Tourist Guide has been organized in the following categories. Each category will be a menu item for selection. The functionality and the requirements for network connection and GPS is also presented.

Category	Functionality	Network – GPS Requirements
1. Cultural	Selection will provide access to a list view of all POIs under this category. Selection of a POI will provide access to POI's article and its related content.	OFFLINE
2. Religion	Selection will provide access to a list view of all POIs under this category. Selection of a POI will provide access to POI's article and its related content.	OFFLINE

3. Nature	Selection will provide access to a list view of all POIs under this category. Selection of a POI will provide access to POI's article and its related content.	OFFLINE
4. Sports	Selection will provide access to a list view of all POIs under this category. Selection of a POI will provide access to POI's article and its related content.	OFFLINE
5. Gastronomy	Selection will provide access to a list view of all POIs under this category. Selection of a POI will provide access to POI's article and its related content.	OFFLINE
6. Routes	Selection will provide access to a list view of all suggested routes in this area. Selection of a route will provide access to a map representation of the route and all the POIs it consists of. Direction for each route will be available. Each POI may be selected in order to get access to POI's article and its related content.	ONLINE
7. Map	It is an online map presenting all the available POIs with different marker, according to their category. Filtering by category will be available. Each POI may be selected in order to get access to POI's article and its related content.	ONLINE
8. Near by	It is an online map presenting all the available POIs near the exact location	ONLINE + GPS

	of the user.	
9. Augmented Reality	Selection activates the device's camera and uses its image as a background for presenting POIs near users exact location. The user can increase or decrease the diameter of the projection cycle.	ONLINE + GPS + GYROSCOPE
10. Update	Selection enables checking if there is new content available or if modifications took place and updates the app properly.	ONLINE
11. Info	List with useful phones. The user can make an instant call by tapping a number and without having to dial a number.	OFFLINE

The article of each POI beside its title, profile photo and description will present the following data.

Category	Functionality	Network – GPS Requirements
1. Multimedia	Selection will provide access to its subcategories.	OFFLINE
1.1 Photos	Selection will provide access to a gallery with maximum three (3) photos. The user can preview, zoom and move the photo.	OFFLINE
1.2 Video	Selection will provide access to the available video on Youtube.	ONLINE
1.3 Photo 360°	Selection will provide access to the available virtual tour. The user will be able to preview, zoom, move to any direction of the spherical environment	ONLINE

	either by hand or by enabling the device's gyroscope.	
2. Map	Selection will point the POI on an offline map.	OFFLINE
3. Drive me	Selection will enable geolocation and identification of user location in order to provide access directions to the selected POI. The user may select to go by car, bus, bicycle or on foot. The functionality is provided by Google Maps.	ONLINE + GPS
4. Share	Selection projects available social networks for sharing on users profile.	ONLINE

4.2.3.3.6 User Interface

The first mock-ups for the user interface can be found on the attached pdf file.

4.2.3.4 Spatial Data Infrastructure (SDI) Portal

The WEB application that will be used to access the spatial data will be the GET SDI Portal.

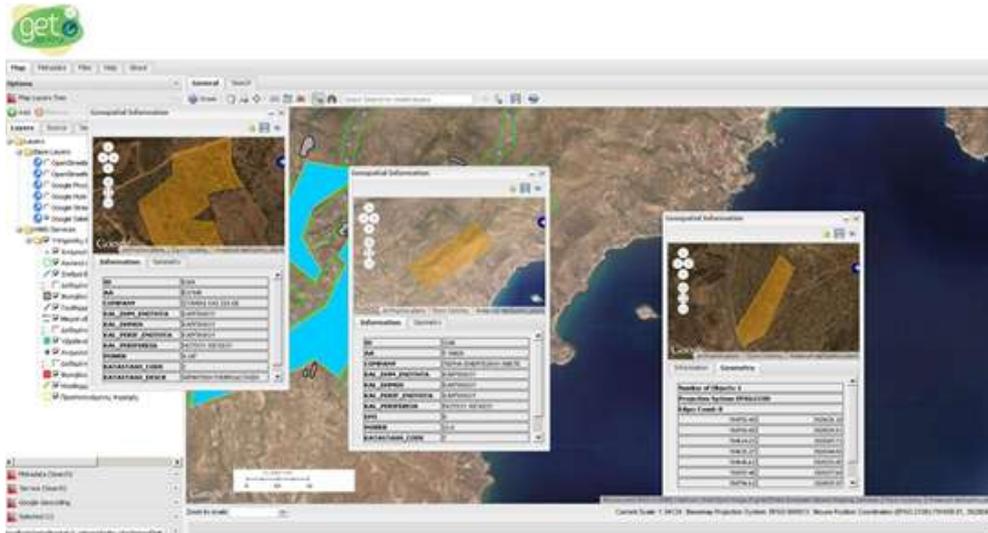


Figure 1: GET SDI Portal instance

GET SDI Portal is a free and open source project that has been developed by Geospatial Enabling Technologies Ltd⁴. to support the implementation of the Inspire Directive. Initially designed to act as an SDI client for INSPIRE Discovery and View Services, has now evolved to a comprehensive platform, supporting the operation of Regional and Thematic INSPIRE SDIs in Greece and abroad.

The software is modular and extensible, addressing the limited availability of ready to use open source geoportal software. It supports ISO/OGC standards including WMS, WMTS, WFS/WFS-T, CSW, WMC, KML, Atom and provides 'ready and easy to deploy' features. GET SDI Portal is based on other FOSS, namely Openlayers, ExtJS, GeoExt και Proj4js and it is available under the terms of GNU General Public License Version 3.

⁴ <http://foss4g.getmap.gr/>

<http://getmap.eu>

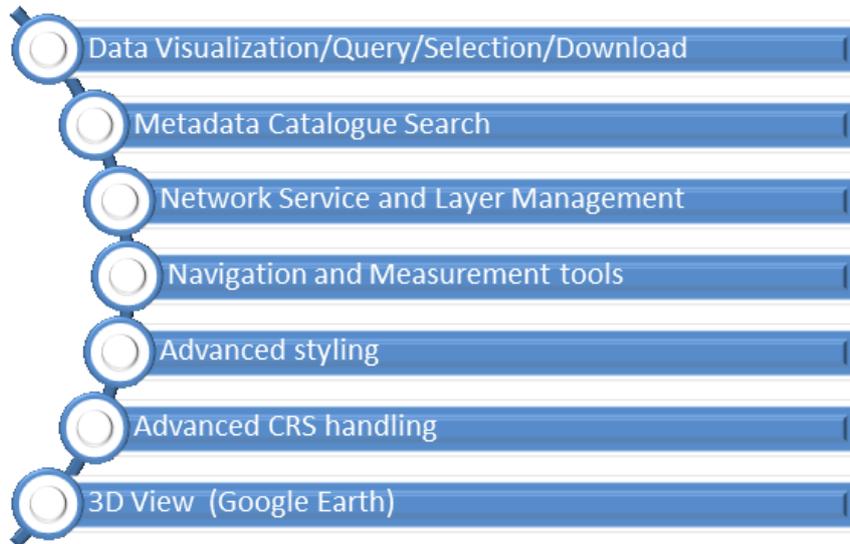


Figure 2: GET SDI Portal main features

GET SDI Portal is currently used by:

- ✓ the Greek Regulatory Authority for Energy (RAE),
- ✓ ten (10) Municipalities in Greece,
- ✓ the Organization for Urban Plan and Environmental Protection of Athens
- ✓ the Military Geographical Institute of Ecuador,
- ✓ the Forest Resource Assessment Project in Nepal,
- ✓ the Academia

The Geoportal development will be based on the FOSS GET SDI Portal ® (latest stable version 2.0, 2012-09-14).

At its core, GET SDI Portal v2.0 is based on open source tools such as **Openlayers**, **ExtJS**, **GeoExt** and **Proj4js** providing a sophisticated web platform for visualization and spatial analysis. Installed and configured in a Web Application Server, GET SDI Portal offers to users simultaneous access to data published through web services, via their browsers.

Software provides users with searching, viewing and querying geospatial data capabilities. Data can be derived from standardized Geo-Web Services, on a

database etc. The software allows the integration of multiple different services in as single map which can be easily navigated.

The software has been entirely developed with the use of Free Software/Open Source Software. It practically consists of two parts:

- Server side part. All the code is written in PHP language.
- Client side part. Most commonly used Web Browsers (Internet Explorer, Firefox, Google Chrome) are supported

4.2.3.4.1 Specific Features

Data Search

The Geoportal will provide users with advanced search options. The search will be based on both attribute and spatial criteria. The proposed functionality consists of:

Search by attribute

- Select the layer of interest
- Select the attribute(s) to search specific values for:
- Select comparison operator such as. ">", "<", "=", ">=", "<=", "Like", "Not Like", "Between", "Not Between", "<>" for every attribute



Figure 3: Advanced search

- Enter the value to compare
- Logical operators such as "AND", "OR" will be also invoked
- Show results table containing the matching records
- The results table will be dynamically connected with the map, meaning selecting a record will fire the automatic pan & zoom of the map at the selected record's extent and vice versa

Example: *Select fields having area greater than 10Ha, or crop type different than*

Search by spatial criteria

In this case spatial operators will be used, such as:

- Current map extent
- Select by rectangle

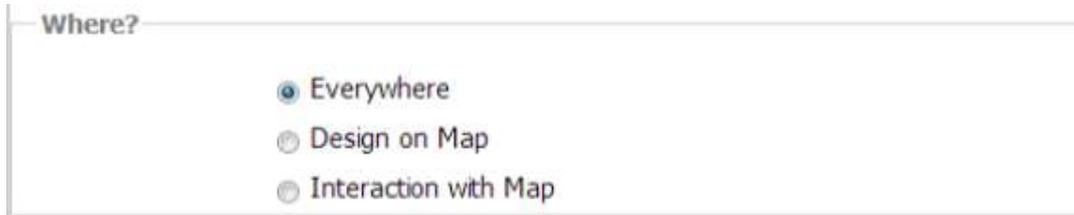


Figure 4: Search by spatial criteria

Search by both attribute and spatial criteria

This is the combination of the above search methods.

The results table will provide filtering, sorting, group by features (see Figure below).

Request Code	Company	Status	Layer
Γ-00198	ΕΝΒΙΤΕC ΑΝΑΝΕΩΣΙΜΕC ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
B-00178	ΑΙΟΛΙΚΗ ΕΥΒΟΙΑC - ΠΥΡΓΟC ΑΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	Αιολικά Πάρκα
Γ-03263	QUEST ΜΑΡΜΑΡΙΟΥ	ΑΙΤΗΣΗ ΣΕ ΑΞΙΟΛ.	
Γ-03500	QUEST ΑΙΟΛΙΚΗ ΜΑΡΜΑΡΙΟΥ - ΛΙΑΠΟΥΡΘΙ ΕΠΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	<input checked="" type="checkbox"/> Request Code
Γ-03768	QUEST ΑΙΟΛΙΚΗ ΜΑΡΜΑΡΙΟΥ - ΑΓΙΟΙ ΤΑΣΙΑΡΧΕC ΕΠΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	<input checked="" type="checkbox"/> Company
B-00183	GHF ΑΙΟΛΙΚΗ ΤΟΥΡΛΑC ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	
00019	ΑΝΑΝΕΩΣΙΜΕC ΠΗΓΕC ΕΝΕΡΓΕΙΑC ΚΑΡΥCΤΙΑC Α.Ε.	ΑΔΕΙΑ ΛΕΙΤΟΥΡΓΙΑ	
Γ-03661	QUESTΑΙΟΛΙΚΗ ΜΑΡΜΑΡΙΟΥ - ΡΙΓΑΝΗ ΕΠΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	
B-00133	ΕΛΛΗΝΙΚΗ ΑΙΟΛΙΚΗ ΕΝΕΡΓΕΙΑΚΗ ΑΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	<input checked="" type="checkbox"/> Status
00206	ΕΛΛΗΝΙΚΗ ΕΝΕΡΓΙΚΟΝΤΟΡ ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	<input checked="" type="checkbox"/> Layer
B-00260	ΜΚΕ ΕΝΕΡΓΕΙΑΚΗ ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
B-00234	ΔΕΛΤΑ ΒΙΟΜΗΧΑΝΙΚΗ ΛΟΚΡΙΔΩC ΑΒΕΤΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
B-00327	ΑΙΟΛΙΚΑ ΜΑΡΜΑΡΙΟΥ ΕΥΒΟΙΑC ΟΕ	ΑΔΕΙΑ ΠΑΡΑΓΩΓΗC	Αιολικά Πάρκα
Γ-00217	ΕΝΒΙΤΕC ΑΝΑΝΕΩΣΙΜΕC ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
Γ-00187	ΕΝΒΙΤΕC ΑΝΑΝΕΩΣΙΜΕC ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
Γ-00197	ΕΝΒΙΤΕC ΑΝΑΝΕΩΣΙΜΕC ΑΕ	ΣΕ ΕΚΚΡΕΜΟΤΗΤΑ	Αιολικά Πάρκα
Γ-03719	QUEST ΑΙΟΛΙΚΗ ΜΑΡΜΑΡΙΟΥ - ΠΕΡΙCΤΕΡΗ ΕΠΕ	ΑΙΤΗΣΗ ΣΕ ΑΞΙΟΛ.	Αιολικά Πάρκα

Figure 5: Instance of results table

Additionally, as previously stated there will be the possibility for discovery of AG Technologies spatial resources through the **Catalogue Service**.

Finally, search tools will be also combined with the download service, providing user with the ability to download selected layers.

Data Download

This is an essential component of the Geoportal and will be structured as described below. First of all the list of layers to be exposed through the WFS can be directly downloaded by the users using client software able to consume WFS services. User access to the Download Service will be based on the AG Technologies' policy.

The Download Service will be further refined by the ability to download only selected features, in a zipped file. This is a very useful functionality in order to prevent the hardware infrastructure resources unnecessary usage (e.g. WFS is disk's resources consuming). Download will be available at the identification pop-up window and/or the search results' list.

Download formats will –at minimum- be:

- Shapefile
- GML
- CSV

File based Download

A file based download will be also available on a separate tab ('Files Tab'). This way AG Technologies will be able to publish through the geoportal files such as reports or even predefined spatial datasets.

1. Tab Section

Includes tabs:

- main window
- catalogue service interface
- files
- help
- about

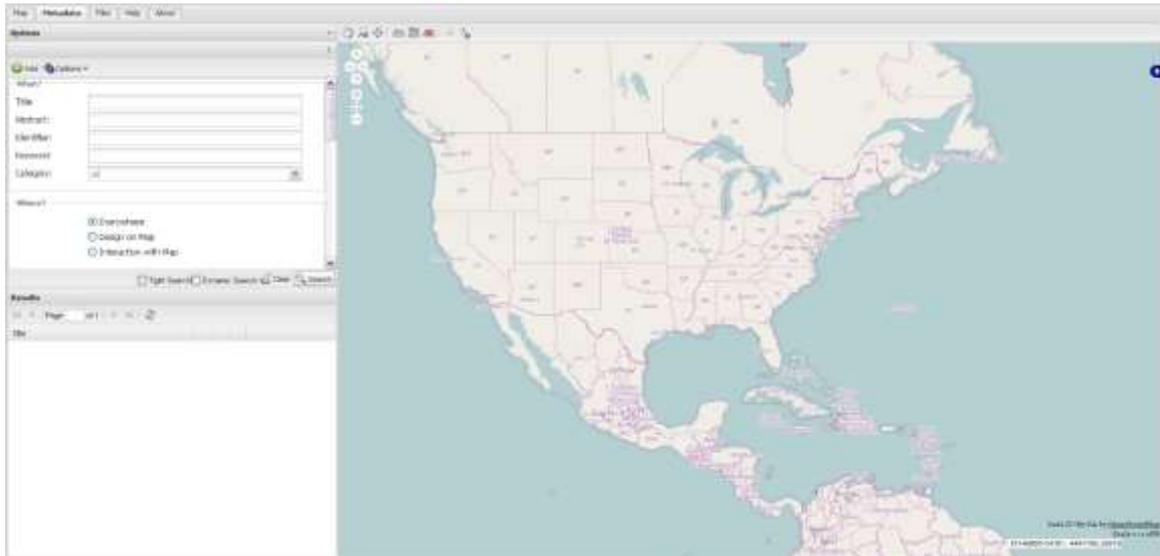


Figure 6: Catalogue Service interface

2. Toolbar Section

Includes timeline and map- controls

3. Layer Management & Functions Section

Includes:

- layer management
- Functions

4. Map Window

The following sections describe in detail the Geoportal features.

General Features

The client-side of the module will have an interactive map providing Web GIS typical functionality, such as:

- Layer management (Add/Remove/Reorder)
- Pan
- Zoom in/out
- Zoom by area
- Measure Distance
- Measure Area
- Get/Set Coordinates (on different coordinate systems)
- Change base layer

- Show scale info
- Coordinate Display

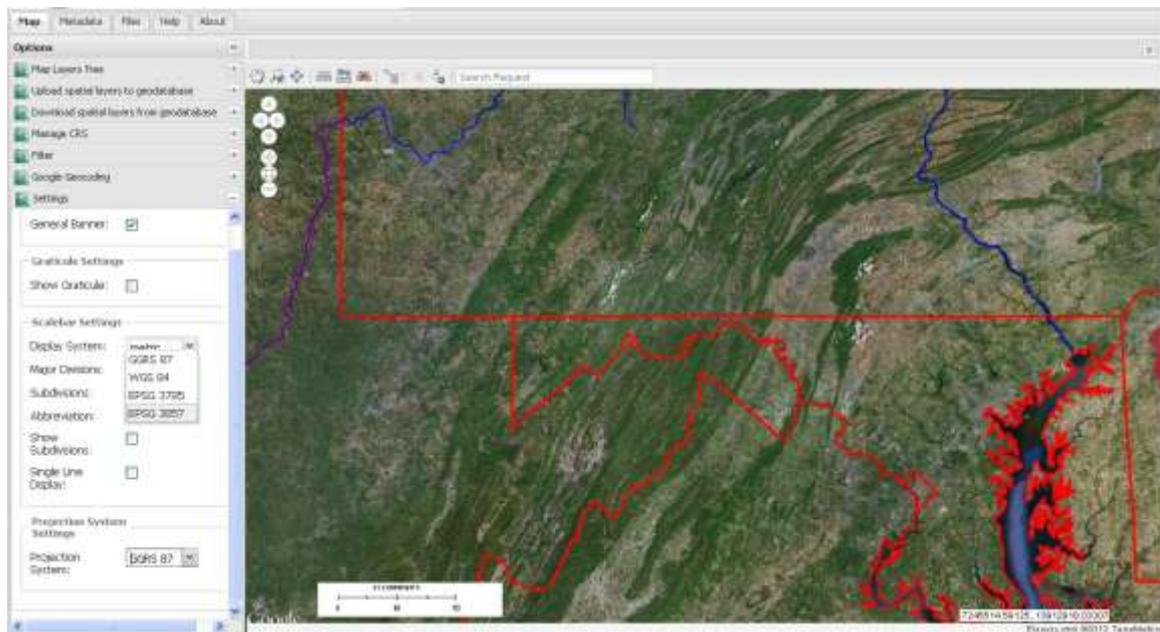


Figure 7: Template proposal for the Geoportals

The module will be also able to consume any third party OGC compliant service regarding WMS, WFS, CSW standards. It will provide user with tools, respectively: (separately described for each service component)

WMS Component

- View multiple layers from different WMS sources on the map
- Add/remove third party WMS (versions 1.1.1 to 1.3.0) service
- Add/remove legend entries from the added WMS services
- Reorder layers
- Hide/show added layers
- Show the legend icon based on the used SLD of the layer
- Change the opacity of each layer on the map
- List of the WMS services that the user added or are predefined
- Zoom to max extent of the layer
- Provide layer information to the user
- Error message where the service is unavailable

WFS Component

- Add/remove third party WFS (v.1.1.0, 2.0) service
- Add/remove legends from the added WFS services
- Change the order that the layers are shown on the map
- Hide/show the added layers

- List of the WFS services that the user added or are predefined
- Zoom to max extent of the layer
- Provide layer information to the user
- View multiple layers from different WFS sources on the map
- Error message where the service is unavailable

CSW Component

- Add/remove third party CSW (v2.0.2) service
- Provide results from CSW search queries in list form
- Provide simple or advance search on different GUIs
- Provide simple search for service queries
- The search engine of CSW able to query simultaneously multiple CSW sources
- Separate functionality and GUI for metadata search where the user can make a query based on spatial and attribute criteria
- For each returned metadata record, the user will be able to view the metadata info of the record in a user friendly GUI where the metadata elements will be displayed. It will also give the ability to visualize on the map the bounding boxes that correspond to the chosen record
- Error message where the service is unavailable
- Option to the user to select the protocol to be used to perform queries (ISO AP CSW, DC, INSPIRE)
- If search result (returned record) is a WMS Service, it will provide user with the ability to add it automatically to the WMS list registered services of the module
- The result list from the query should be dynamic according to at least the following:
 - Bounding box of the current map (each time the user pan/zoom to the map the result should be recalculated based on the bounding box of the current map)
 - Bounding box of a drawn rectangle from the user
 - Bounding box based on the coordinates given from the user

User will also be able to use the identify tool, which interactively highlights the features (on mouse over) and with a click the feature's attribute table will be shown.

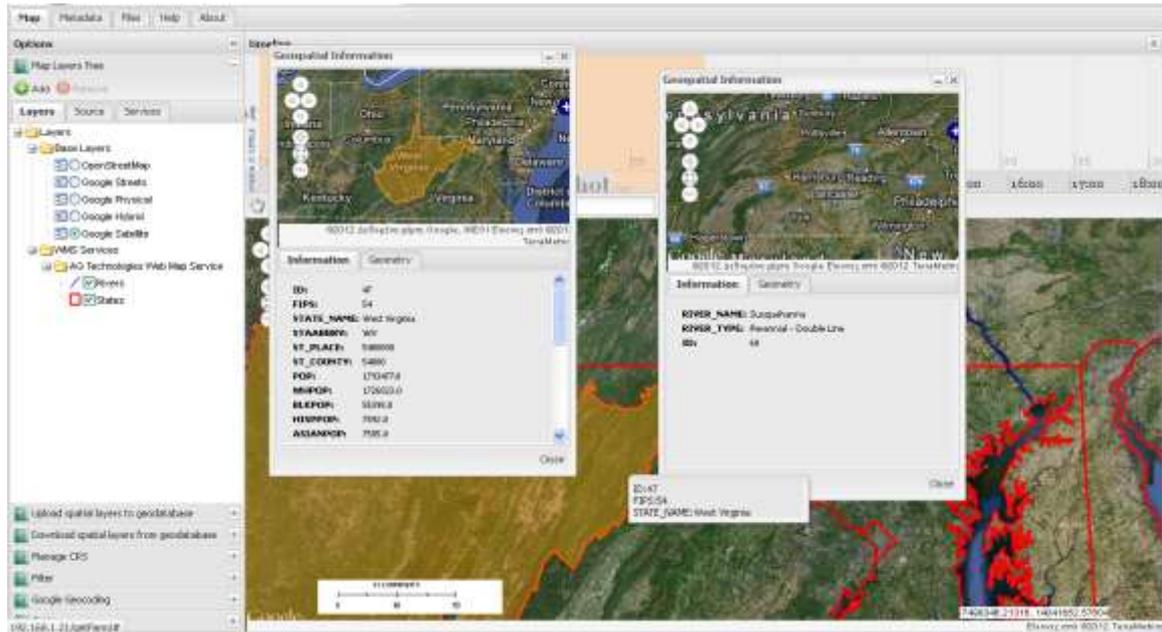


Figure 8: Identification function in Geoportal

4.2.4 Infrastructure

In order to have a functional and operating web platform, proper administration and management of the platform and its data as well as receiving remote backup is required. In order to facilitate this requirement the following types of infrastructure will be provided.

4.2.4.1 Hardware

Server

Item: 1

DELL SERVER PE T320 E5-2420 v2/8GB LV RDIMM/2X300 SAS/DVD-RW/PERC H710/5y Basic Warranty – NBD

Windows 2012R2 Std DSP

E5-2420 v2 2.20GHz, 15M Cache, 7.2GT/s QPI, Turbo, 6C, 80W, Max Mem 1600MHz, 8GB RDIMM, 1600MT/s, Low Volt, Single Rank, x4 Data Width 2 X 300GB SAS 6Gbps 15k 3,5" HD Hot Plug, PERC H710 Integrated RAID Controller, 512MB NV Cache, 16X DVD+/-RW Drive, Broadcom 5720 DP 1Gb Network Daughter Card, iDRAC Enterprise, Redundant Power Supply (1+1), 750W, Warranty : 5Yr Basic Warranty - NBD

Additional info: Tower Chassis, for Up to 8x 3,5" HDDs , RAID 1 for H710p, H710, H310 Controllers, Optional Riser with 1 Additional x8 PCIe Slot for x8, 2 PCIe Chassis with 1 Processor Energy Smart Non-High Output Dual, Hot-plug, Redundant Power Supply (1+1), 750W

Server Screen: Samsung S23C650D

Workstations

Items: 4

PC DELL OptiPlex 3020MT i5-4570/4GB/128GB SSD/DVD+/-RW Drive/-RW/WIN7 PRO (64bit)/5Y NBD

Intel(R) Core(TM) i5-4570 Quad Core Processor(3.2GHz, 6M, 86W), 4GB (1x4GB) Non-ECC DDR3 1600MHz SDRAM Memory, 128GB Solid State Drive, 16X Half Height DVD+/-RW Drive, Keyboard : Greek (QWERTY) Dell KB212-B QuietKey USB Keyboard Black, Dell(TM) MS111 USB Optical



Mouse, Windows 7 Professional (64Bit Windows 8 License, Media) English, MS
Media: Windows 8 (64Bit) Resource DVD, Warranty: 5Yr Basic Warranty NBD on site
Workstation Screen: Samsung S23C650D

Storage Area Network

DELL SERVER PE T320 E5-2420 v2/8GB LV RDIMM/2X300 SAS/DVD-RW/PERC
H710/5y Basic Warranty - NBD

E5-2420 v2 2.20GHz, 15M Cache, 7.2GT/s QPI, Turbo, 6C, 80W, Max Mem 1600MHz,
8GB RDIMM, 1600MT/s, Low Volt, Single Rank, x4 Data Width 2 X 300GB SAS 6Gbps
15k 3,5" HD Hot Plug, PERC H710 Integrated RAID Controller, 512MB NV Cache, 16X
DVD+/-RW Drive, Broadcom 5720 DP 1Gb Network Daughter Card, iDRAC
Enterprise, Redundant Power Supply (1+1), 750W, Warranty : 5Yr Basic Warranty -
NBD

Additional info: Tower Chassis, for Up to 8x 3,5" HDDs , RAID 1 for H710p, H710,
H310 Controllers, Optional Riser with 1 Additional x8 PCIe Slot for x8, 2 PCIe Chassis
with 1 Processor Energy Smart Non-High Output Dual, Hot-plug, Redundant Power
Supply (1+1), 750W

SAN HD: Seagate ST4000NM0033 4TB SATA III

Printers A4

Items: 4

Samsung SL-M3820ND

Multifunction Printer A4

Item: 1

Samsung Color CLX-6260FD

All equipment is supported with warranty by the Contractor for **five (5) years**,
providing maintance and troubleshooting within two working days on site.

The server will be equipped with an application that allows performing automated
remote backup of application databases and images of virtual machines on which the
platform is installed. The remote backup, will be stored at the SAN.

4.2.4.2 Web Hosting

The platform will be hosted on a cloud environment in a fully equipped, state-of-the-art Cloud Data Center for **five (5) years**.

The ISP will be **Lancom** (www.lancom.gr) and their company profile is available in the following url: <https://www.lancom.gr/profile.pdf>

The service we are providing is the **Cloud Servers** series of Lancom, and we receive autonomous virtual servers (virtual machines) of high performance, hosted on the proprietary Enterprise Level Cloud Infrastructure of Lancom.

The Cloud infrastructure consists of an array of physical servers, network devices, storage media, interconnected in a high availability configuration. As a result of this design is that each cloud Server in this environment enjoys superior performance and most importantly 100% Hardware uptime.

In case of failure of one server, through a fully automated process, the remaining undertake to cover the necessary resources. At the same time the owner of a Cloud server enjoys maximum flexibility, having the ability to increase or decrease the resources immediately required (eg. addition of CPU cores, addition of extra drive, addition of RAM).

The use by Lancom of only Enterprise Class equipment from HP and Cisco, the Virtualization **vSphere** platforms from **VMware** and **Hyper-V** from Microsoft, its specialized staff, its strategic partnerships and its certifications of ISO 9001 and ISO 27001 in Cloud services, ensure unique, high quality services.

The provided Virtual Machine for the Adriatic Route Platform will have 2 Cores - 8GB RAM – 1.000 GB HDD - 1 Static IP - Unlimited Traffic – OS: Ubuntu. Sufficient resources will be available to ensure the information system will meet the response requirements set.

The Datacenter will provide all the necessary infrastructure for hosting applications while providing a number of services 24/7. In this context, we provide co-location

services, exploiting this way standard features such as UPS, air conditioning, 24-hour support, controlled environment, continuous operation of the network around the clock etc.

The total installations of Lancom's data center consists of proprietary infrastructure, while the design has been done in accordance with the latest international standards, covering every modern need to the fullest. All equipment is enterprise class from HP, with full high availability (HA) at all levels, providing unparalleled performance, guaranteed stability and uptime on all services.

- Greek data center in the center of Thessaloniki and Athens
- **Guaranteed availability of 99.95%**
- Modern fiber optic network
- High Availability
- **100% hardware uptime**
- Enterprise class storage systems
- Classified Access
- Perimetric protection (CCTV, presence sensors)
- Controlled environment with stable humidity, ventilation and air conditioning conditions – HVAC
- System of uninterrupted energy supply (UPS, generator)
- CO2 Fire Network
- Systems of high availability 2N (routers, core switches, firewalls, air conditioning, UPS)
- Firewalls
- DDoS Protection & Mitigation Systems
- Intrusion Detection & Prevention Systems
- Isolation of the internal network and critical data from the internet
- 100% privately owned facilities and equipment
- Provision of Service Level Agreement (**SLA**)

4.2.4.3 Domain Name

The domain name <http://www.adriatic-route.com/> has been registered for **five (5) years**.

4.2.5 General Requirements

4.2.5.1 Interoperability

Interoperability denotes the ability of diverse systems and organizations to work together (inter-operate). In this case, it is the ability to interoperate - or intermix - different technologies and datasets.

Interoperability is important because it allows for different components to work together. This ability to componentize and to 'plug together' components is essential to building large, complex systems. Without interoperability this becomes near impossible — as evidenced in the most famous myth of the Tower of Babel where the (in)ability to communicate (to interoperate) resulted in the complete breakdown of the tower-building effort.

GIS, like other information technology, is engineered to work well with computing technologies as well as other geospatial tools. There are three key aspects to interoperability in GIS:

- Interoperability with information technology standards
- Web standards
- GIS interoperability

The GIS system should conform to open standards, enterprise information technology (IT), and web-computing frameworks. This will ensure that users could incorporate GIS in any application and on a variety of computing and mobile devices and could use geographic information accessed from multiple databases and web services.

Here are some key interoperability aspects of GIS.

- **Web standards**

One trend is the integration of GIS with other applications (both GIS and other IT systems) on the World Wide Web, which can be used to integrate disparate information systems and orchestrate work across those systems. Web services

can be used as the building blocks to implement critical business practices, workflows, and information flows within and across organizations.

Web services interfaces for managing and exploiting information and software logic should be a key aspect to GIS. Standards-based web services and messaging protocols, such as HTTP, HTML, XML, REST, KML, and SOAP, should be fully supported in GIS. These are the same technology standards that are used in mainstream business and enterprise computing frameworks.

By using these protocols, GIS information services can be delivered to any web client—professional desktops, web browsers, mobile clients, smartphones, and to other information technology.

- **GIS, map, and image services on the web**

With GIS, users should encapsulate their GIS work as a number of standards-based GIS services, including geodatabases, map, geoprocessing models, image catalogs, metadata documents, and so on. Each of these GIS elements can be published as open web services, then discovered and used in web and mobile computing frameworks.

A key GIS trend is the use of 2D and 3D map services that are accessed across the web in any number of client applications, from desktop-mapping software and standard web browsers to Google Earth and Microsoft Bing Maps and mobile devices. Many GIS organizations publish key aspects of their content as multiresolution basemaps with high performance and ease of use. They value the ability to leverage open web map services as digital basemaps onto which they can layer their operational GIS information and tasks.

GIS should leverage all these frameworks. GIS web services should communicate through the Open Geospatial Consortium, Inc. (OGC) series of web services specifications (such as WMS, WMTS, WFS, WPS and WCS). The OGC KML data format, widely used on the web, should also be supported.

These open up access to GIS information in many web, mobile, and cloud computing scenarios.

- **Data Interoperability**

GIS and geospatial data come in hundreds of file formats and from many organizations worldwide. Hence, it's important that GIS support the use of as many as possible of these formats.



GIS open source tools like **GDAL** provide access to a variety of GIS formats. This enables GIS to recognize dozens of additional nonnative formats and allows users to work with them directly, just as they would work with standard GIS formats.

4.2.5.2 Multi-channel Approach

Approaching a critical mass of end-users through various channels is necessary in order to achieve optimum results. As the main focus shifted from the traditional PC, on mobile devices, smart-phones and tablets, significant changes in the habits of users took place. The user no longer wants to be limited and wants access to the Internet everywhere, constantly and the request for "rich" content keeps growing.

For this reason, the applications under development will not simply redirect the user to the internet but will provide an integrated environment of interaction. The multi-channel approach in combination with the new trends in information technology where information is transferred to the "cloud" and is accessible from anywhere, anytime. A user creating a profile to any device (eg. Netbook) will be able to use it and any other (eg. Smartphone, tablet, etc.) either public or private. Profile and user preferences remain in the "cloud" always available, always updated and easy to share them.

Therefore we are adopting the principles of "Designing for All", namely the standard WAI / WCAG, in order to facilitate proper access of online services via mobile desktop platforms.

The system will provide administrators and users a common, unified digital access point in the form of an Web Portal. The portal will provide easy access, via the Internet, to a number of subsystems and applications that support the services of the project. The portal will be accessible by everyone and from anywhere without having to install special software. The employees of all project partners as well as citizens will have access to all the services, based on different usage rights.

Additionally, the Web Portal will be properly presented to mobile phones or other smart devices. This will be achieved through the adoption of the "Responsive Design" principle.

Finally, some services will be accessible from mobile devices through native mobile applications that will be downloaded, free of charge, from the respective online apps

market and installed locally. This way, part of the content will be available even without Internet connection (offline).

4.2.5.3 Open Data

Open data is data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike.

The full Open Definition gives precise details as to what this means. To summarize the most important:

- **Availability and Access:** the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.
- **Re-use and Redistribution:** the data must be provided under terms that permit re-use and redistribution including the intermixing with other datasets.
- **Universal Participation:** everyone must be able to use, re-use and redistribute - there should be no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), are not allowed.

The goals of the open data movement are similar to those of other "Open" movements such as open source, open hardware, open content, and open access. The philosophy behind open data has been long established, but the term "open data" itself is recent, gaining popularity with the rise of the Internet and World Wide Web and, especially, with the launch of open-data government initiatives such as Data.gov and Data.gov.gr.

The rationale behind **open government data** can be considered as twofold. First, advocates contend that making government data available to the public in open formats increases government transparency and accountability. Second, open data should enable third parties to leverage the potential of government data through the development of applications and services that address public and private demands.

Several national governments have created web sites to distribute a portion of the data they collect. It is a concept for a collaborative project in municipal Government to create and organize Culture for Open Data or Open government data. A list of over 200 local, regional and national open data catalogues is available on the open source datacatalogs.org project, which aims to be a comprehensive list of data catalogues from around the world.

The European Commission has created two portals for the European Union: the EU Open Data Portal which gives access to open data from the EU institutions, agencies and other bodies and the PublicData portal that provides datasets from local, regional and national public bodies across Europe.

4.2.5.4 Security Issues

We will perform all the required actions facilitating the following:

- Security of Information Systems, Applications, Media and Infrastructure
- Protection of the integrity and availability of information
- Protection of personal data
- User identification and authentication

The main security issues which will be taken into account are:

- Application Security. It concerns the available functions of the subsystems and applications that end users can perform according to predefined roles assigned to them.
- Database Security. It involves the application of a predetermined Security Policy, on the possibility of accessing and processing of database information.
- Network Security. It concerns the protection data during their transmission over networks.
- Physical Security. It concerns the protection of infrastructure from the risks associated with either human intervention (unauthorized access, theft, vandalism) or by natural causes (fire, floods, earthquakes) etc.

Information security is characterized as the adherence to the following requirements:

- Confidentiality: Ensuring the information is accessible only by those who have the necessary permissions.
- Integrity: Safeguarding the accuracy and completeness of information and processing methods thereof.
- Availability: Ensuring information accessibility to authorized users whenever necessary.

The following actions will take place.

- Access control
Control of access to the system will be carried out centrally and will be achieved through the use of unique user account (username) and password (password). A password policy will be available including all the settings (length, expiration time, complexity, etc.) as defined by international standards and existing technology.
- Regular data backup
We will develop the policy of creating regular backups of system data (backup policy). The policy will include a backup schedule, the data which are necessary for the proper functioning of the system and the process of the correct creation of backups (backup monitoring and restore). Finally, we will develop the proper procedure for storage and protection of backup files from alteration or destruction.
- User groups
We will define multiple access rights per user and per user group on system functions and different access rights to each category of document.
- Administration monitor - auditing and audit trail
The policy will include roles and responsibilities of key users and will provide the protection of critical control files (audit trails / audit logs).

4.2.5.5 Usability

Special attention will be given to the visual design of the platform, taking into account the the content displayed and the targeted user groups. The design of the GUI will be based on web principles and usability patterns.

We take into account the different levels of functionality provided per group of system users in order to achieve high levels of usability and ergonomics. In this way, the system will enable users to carry out their transactions in immediacy and convenience.

The design approach will be characterized primarily by:

- consistency in the user interface, which will be enriched with drop-down lists that will facilitate the access to information based on descriptive or spatial criteria, with collapsible toolbars for grouping similar user interaction tools, with tabs for grouping related functions and separating individual process steps, emerging tooltips for each user interface component, etc.
- orientation in order to provide a clear position and state of the user when completing a process
- reliability, providing immediate understanding of the proper use of each subsystem.

During pilot operation, the system will go through usability testing and the results will be used to improve the applications and services. The main steps are the following:

Step 1:	Compatibility of applications and services
Target:	The applications and services must be compatible with at least 4 web browsers: <ul style="list-style-type: none">• Microsoft Internet Explorer• Mozilla Firefox• Google Chrome• Opera• Apple Safari.λπ.

Step 2:	Consistency of applications and services
Target:	Applications and services should have a uniform appearance and adhered consistently to the use of verbal and symbols.

Step 3:	System Reliability
Target:	The user must easily understand through the GUI appearance and behavior of the system that its operation is reliable.

Step 4:	System orientation
Target:	The user must be aware in every section of WebGIS portal, where he/she is, where to go and what actions can / should do.

Step 5:	User support
Target:	The system must provide support and assistance functions for users. The system will provide on-line help, user guides.

4.2.5.6 Accessibility

Accessibility is an important concept addressing a growing user population and includes persons born disabled or who become disabled due to accident, illness or age.

The Portal and Web Applications to be developed adopt the principle of "Designing for All" integrating all the necessary requirements of accessibility for people with disabilities based on internationally recognized standards, such as the W3C accessibility guidelines. The portal will provide easy access to all users, with special regard to people with disabilities. For this reason, the design and development of the Portal and its services will be in accordance with the Accessibility Guidelines Web Content 2.0, provided by W3C and specifically Web Content Accessibility Guidelines Directives (WAI / WCAG) v2.0, level of compliance AA.

Applications will be checked for accessibility by selected users, during pilot operation. The results will be used to improve the applications.

4.3. Content

The content that is going to be uploaded to all project applications is critical to their success and user acceptance.

4.3.1 Content Types

The consortium has agreed on collecting the following types of content for each POI that is going to be uploaded to the applications.

- POI_ID - "Integer"
- TITLE ENGLISH – "Text"
- TITLE NATIVE LANGUAGE – "Text"
- CATEGORY – Selection among (Culture – Religion – Nature – Gastronomy – Sports)
- REGIONAL UNIT – "Text"
- REGION - TOPONYM – "Text"
- SHORT DESCRIPTION ENGLISH – "Text (100-200 CHARACTERS)"
- SHORT DESCRIPTION NATIVE LANGUAGE – "Text (100-200 CHARACTERS)"

- DESCRIPTION ENGLISH - "id_eng.rtf (100-200 WORDS)"
- DESCRIPTION NATIVE LANGUAGE - "id_nat.rtf (100-200 WORDS)"
- KEYWORDS ENGLISH – "Text"
- KEYWORDS NATIVE LANGUAGE – "Text"
- MAIN PHOTO – "JPG – TIFF"
- PHOTOS_FOLDER - "JPG – TIFF"
- GPS COORDINATES – "WGS 84 GOOGLE MAPS (Latitude & Longitude)"
- ROUTE
- DOCUMENTATION – "EXTERNAL URLs"

4.3.2 Collection Methodology

In order to facilitate the collection of data LP has created an excel file that all partners shall use for providing properly structured data.

PARTNER:		REGION OF EPIRUS		NATIVE LANGUAGE:		GREEK												
POI_ID	TITLE ENGLISH	TITLE NATIVE LANGUAGE	CATEGORY	REGIONAL UNIT	REGION - TOPONYM	SHORT DESCRIPTION ENGLISH	SHORT DESCRIPTION NATIVE LANGUAGE	DESCRIPTION ENGLISH	DESCRIPTION NATIVE LANGUAGE	KEYWORDS ENGLISH	KEYWORDS NATIVE LANGUAGE	MAIN PHOTO	PHOTOS_FOLDER	GPS COORDINATES WITH 84 GOOGLE EARTHS LOCATION (LONGITUDE)	ROUTE	DOCUMENTATION (EXTERNAL URL)		
1	Archaeological Museum of Ioannina	Αρχαιολογικό Μουσείο Ιωαννίνων	—Culture	IOANNINA	IOANNINA	Text (500-200CHARACTERS)	Text (500-200ΧΑΡΑΚΤΗΡΕΣ)	IE_ημγ_07 (500-200 WORDS)	IE_ημγ_07 (500-200 ΧΩΡΟΙ)	Museum		μην_μουσ_1_07D	Arch_museum	39.69279, 20.81704		http://www.μην.αθ http://www.μην.αθ/μην		
2			Σημεία (Click Here!)															
3			Σημεία (Click Here!)															
4			Σημεία (Click Here!)															
5			Σημεία (Click Here!)															
6			Σημεία (Click Here!)															
7			Σημεία (Click Here!)															
8			Σημεία (Click Here!)															
9			Σημεία (Click Here!)															
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11			Σημεία (Click Here!)															
12			Σημεία (Click Here!)															
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29			Σημεία (Click Here!)															
30			Σημεία (Click Here!)															

GUIDELINES
 All the descriptions of Points of Interest (POIs) shall be located in the same folder as the excel listing them.
 For each POI there shall be a subfolder named Photos. The Photos subfolder will contain all available photos of the article as well as the main photo. We suggest to provide 3-5 photos.
 Each photo should be accompanied by a text file having the same filename as the photo. The content of the text file shall be the caption (legend) of the photo.
 The Partner must the Intellectual Property Rights of all photos.
 If a POI is a part of a suggested Route please indicate that. Don't forget to complete the next sheet named "ROUTES".

All partners shall insert their data to the provided xl file for fifty (50) at least POIs of their area and provide it to the LP.

Each partner is responsible for providing content that is checked for its integrity and free of any intellectual property rights.

5. PILOT OPERATION

During the pilot operation of the system we will take the following actions:

1. Inform stakeholders on the launch of pilot operation namely:
 - Site users.
 - Users of online services.
2. Launch the pilot operation of all system components with presence of our staff which will record any events and make all the appropriate treatment actions.

The objective of the pilot operation period is the operation of the system under real working conditions. In particular, during the pilot operation period we will check thoroughly:

- The encodings used
- The configurations and software adjustments made
- Installation of equipment
- The system software settings
- The database settings
- The integration of the software with the required procedures
- The response of the system
- The interfaces and data exchanges
- Any other parameter affecting the proper operation of the system
- The final system configuration to improve performance (fine tuning)
- The smooth functioning of the various subsystems and functions.
- The security settings

During this period, we will be in close cooperation with the key persons of the organization and will offer the following services:

- Troubleshooting,
- Debugging
- User support (collect feedback from users, support the operation of applications, etc.)
- User Satisfaction Survey (both end users and administrators) regarding:
 - User friendliness

- Usability
- Flexibility
- Support help- desk
- Update of software documentation.

6. TECHNICAL SUPPORT

All the software applications as well as the computational infrastructure is supported with warranty by the Contractor for **five (5) years**, providing maintenance and troubleshooting within two working days on site.

During this period we will provide:

- Helpdesk: The helpdesk will be available to system administrators by phone, fax, email and special application log events (ticketing).
- Qualified Technical Team: We will maintain a pool of qualified staff for supporting the subsystems of the Application.

We will provide the following services:

- Software Maintenance
 - Identify causes of damage / dysfunction and amendment.
 - Delivery – installation of any new software versions.
 - Ensurance of proper functionality
 - Delivery of copies of all changes or reissues or modifications of software manuals.
 - Renewal of License of software packages.
- Technical support
 - Technical Support Services via Helpdesk.
 - On site support. When reported problems can not be solved directly and permanently from the first level of intervention (Helpdesk), will be forwarded to specialists who will give the required solution on the spot.
- Proactive maintenance: Two (2) times a year at least, we will proceed to control and optimization of the operation of the system by authorized technicians.

In the server will be installed properly materialized application which allows performing automated process making remote backup application databases and images of virtual machines on which application is installed, which will be stored in the procured NAS.

7. TRAINING

The training program has been designed to meet the need for developing specific skills for using and administrating the applications and IT procedures of the new information system, based on the capabilities of the staff of the Project Partners and the LP but will also cover more general topics that are considered necessary for optimal operation and exploitation of project results.

The training program consists of two (2) individual training modules, which aim at gradually make the trainees reach the desired level of knowledge and capabilities for using and managing the new system, based on the needs of each trainee group. However, the training modules will be finalized based on the research of training needs of the staff of the Project Partners and will be implemented during the training phase.

The proposed training modules are as follows:

- Thematic Area A: System Administration
Seminars focused on system and database administrators of the LP
2 to 4 persons
- Thematic Area B: System Utilazitation
Seminars focused on internal data providers and end-users of the system
6 to 10 people

Each module defines a field of knowledge and the order in which they are presented will provide the necessary capabilities to the trainees, as well as the base for being able to attend the next part of the educational process.

Thematic Area A: System Administration

ID	MODULE	DURATION (HOURS - DAYS)
1	Operation & Management of Hardware and Software Infrastructure	12 – 2

2	Management of Spatial Data	12 – 2
3	IT Platform & Software Development Environment	12 – 2
4	Management & Customization of Databases and Applications	12 - 2
TOTAL		48 - 8

Thematic Area B: System Utilazitation

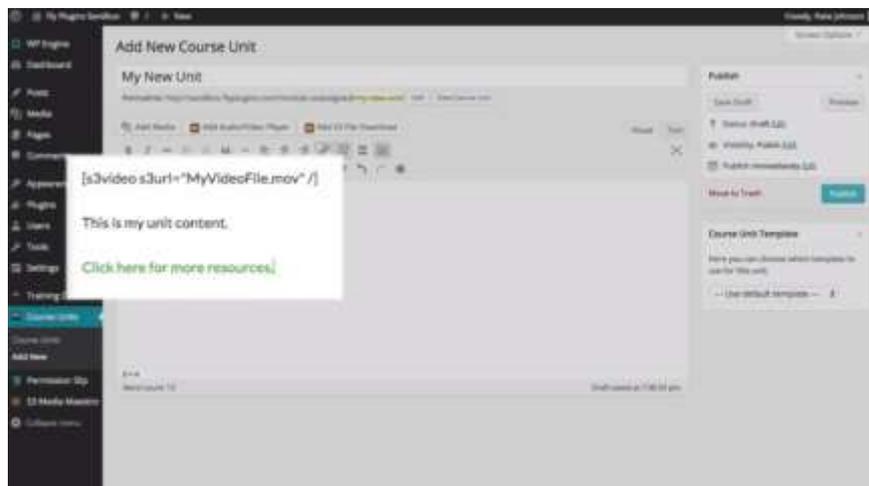
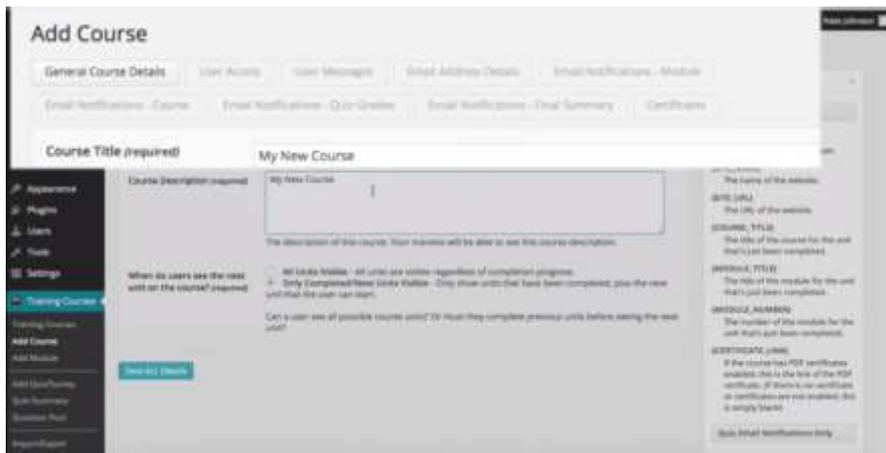
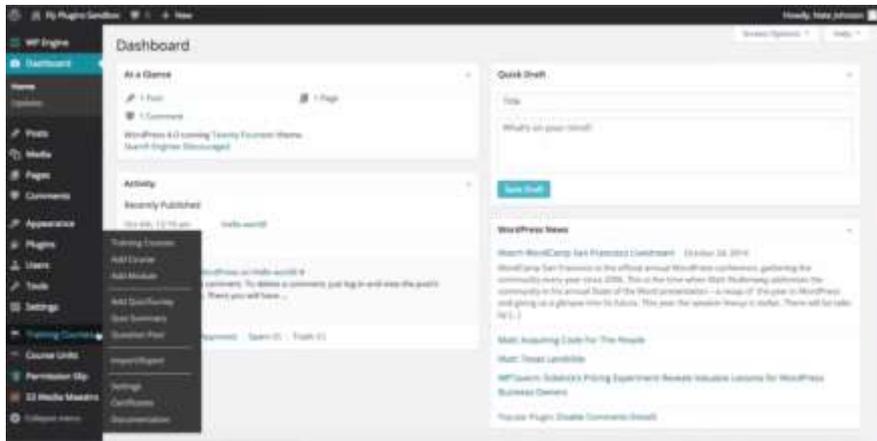
ID	MODULE	DURATION (HOURS - DAYS)
1	System Features	12 – 2
2	Basic Functions – Content Management	12 – 2
3	Exploitation of Geospatial Data	12 – 2
4	Usage & Management of IT Applications	12 - 2
TOTAL		48 - 8

We will develop both training materials and the syllabus for each module and the LP will select those it deems necessary to take place per group according to the needs of stakeholders.

Training will take place both at LP's available offices and during an upcoming Partner Meeting, on dates decided by the consortium .

Main courses will also be available via the "Learning Area" of the project website. In order to achieve that an easy to use Learning Management System will be implemented (WP Courseware). Training will be delivered mainly in the form of .PPT presentations. However, other types (video, audio etc.) are not excluded.

Training courses will be categorized according to each topic. Training material will be uploaded and managed by administrators while trainees will be in most cases Project Partner staff.







8. TIMETABLE

The timeplan for implementing all the actions is provided in the following table. It is expected that all actions will be completed by 30/9/2015.

ID	ACTION	START	DURATION	END	15-DAYS SEGMENT								
					1	2	3	4	5	6	7	8	
1	DEFINITION OF FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE WEB – GIS PLATFORM	1	2	2	█	█							
1.1	Implementation Study	1	1	1	█								
1.2	Consultation of the Implementation Study	2	1	2		█							
1.3	Finalization of the Implementation Study	2	1	2		█							
2	DESIGN AND DEVELOPMENT OF THE WEB-GIS PLATFORM	1	6	6	█	█	█	█	█	█			
2.1	Design of data-bases, user interface, multilingual components	3	1	3			█						
2.2	Development of the Web-GIS platform	1	5	5	█	█	█	█	█				

