Article

Cultural Routes in Kynouria of Arcadia: Geospatial Database Design and Software Development for Web Mapping of the Spatio-Historical Information

Lampros Boukouvalas[1], Gregory Grigorakakis[2] and Andreas Tsatsaris[*]

1 University of West Attica, Department of Informatics Engineering, Agiou Spiridonos & Pallikaridi St., 12243, Egaleo, Athens, Greece; lambrosbouk@gmail.com

2 Ephorate of Antiquities of Kefallinia, 5 Mantzavinou St., Argostoli, Kefallinia; ggrigorakakis@culture.gr

* University of West Attica, Research Laboratory of Geospatial Technology, 28 Agiou Spiridonos St., 12243, Egaleo, Athens, Greece: atsats@teiath.gr, Tel.: +30-210-538-5388

Abstract: On the occasion of Kynouria and in order to achieve the protection and projection of antiquities, a web-based model is proposed for highlighting individual monuments and archaeological sites, having in mind the historical and archaeological evidence of the region, the topography, the demographic profile and the tourist infrastructure, and combining them with the development programs for cultural routes. Therefore, creating suitable databases and mapping the monuments in the area are key prerequisites of the process, as they contribute to an objective assessment of the current situation and then to make rational decisions. In this frame, modern technology provides some important planning tools (GIS, GPS, and OMS) which allow recording and mapping of data, viewing the relationships between them in the area where they appear and managing their projection. The complete study of Kynouria's archaeological routes contains the implementation of a website using free or open-source software, which should include all the necessary procedures and the historical and archaeological information material (text, maps, and photographs).

Keywords: Antiquities; Monuments; Cultural Routes; Greece; Kynouria; GIS; Websites; Story maps.

1. Introduction

Highlighting not only a single site or monument but the overall cultural heritage of a region through web mapping is the issue in this project. The economic situation and the need for rationalization of the decision-making processes requires an implementation which will allow the fewest possible means and resources to achieve the key objectives of the promotion, accessibility, and protection of antiquities on the one hand, and on the other their integration into the given social and economic context so that they can be used as a keystone for local growth.

Search for similar applications via the websites of municipalities and regional entities almost always give the same result: a section of the website is devoted to the sights, accompanied by a description and maybe a built-in Bing or google map. In rare instances, the map depicts the locations of attractions, and even more rarely it includes some suggested routes. Something similar happens in most climbing sites and hiking clubs where social networks are widely used. All these considered, several different proposals are more attractive and technologically up to date:

- Archaeological Museum of Tegea [1]: A very impressive web presence, with multilingual support and great photos. The strong point of this website is the clear and interactive maps and the 360° virtual tours to exhibits, the interior of the museum and the monuments that lie outside the area of the museum, and the 3D representations. This site was the base-model on which we relied for the preparation of this work; it is the complete website concerning Greek

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archaeological sites and technically it is more suitable to the application under discussion because the Museum's website was created in ASP.

- Kentucky's state forests [2]: A key feature is the use of virtual travel maps and targeted information, based on a combination of maps and images. Although it is not an archaeological site (it projects forests and routes in nature), we adopted the main idea of presentation in order to meet our needs. It was also built using a software tool called "ArcGIS", the online version of which is free and suitable to prepare our project before serving it on a website.
- Transromanica [3]: The "Transromanica Association" is focused on the common cultural heritage of the Romanesque art and architecture of eight countries in Europe between the Baltic and the Mediterranean Sea (Greece is not included). It provides facilities sorted by region, such as tourist boards and offers, searches for heritage (monasteries, churches, cathedrals, highlights, and others), search for events and an interactive Bing map.
- "Monopatia politismou" [4] (translated as "Greek Paths of Culture"): It is a project for the protection of the environment and our cultural heritage. By selecting a series of walks, and with careful signposting and communication, paths were made accessible and attractive again. This website is characterized by a youthful style, simplicity and net information, which is not limited herein as it also combines images and videos. This project is useful to lovers of nature, but it does not contain any significant information about antiquities since it is not an archaeological site. Therefore, the main idea of the developers is very close to ours.

2. Monuments and the development process

The transition in the attitude on the recognition of the value of cultural – and specifically of the value of archaeological – heritage is now a fact. Culture is a driving force of the economy [5]. Cultural heritage contributes to the economic and social development and this is a much more qualitative approach than the approach suitable for a mere commercial product. Grigorakakis [6], rightly claims that culture is a public good and common heritage of humanity and that is the main reason for which we have to maintain and highlight it. This approach implies that cultural heritage can be another important tool for local economic development, considering the dimension of how to attract more travelers. Among the most common and important conditions for selection of tourist destinations is the enhanced natural and cultural environment. This is a reason for self-questioning:

- How areas of tourism should exploit their existing cultural heritage, avoiding disruption of existing economic and social fabric.
- How individuals could earn from activities performed by focusing on those areas.
- How to avoid damages caused to cultural or natural resources, how to evaluate and estimate possible damages and how to create a mechanism for repairing the damage to the natural or human environment using a part of the earnings from the individuals. It is even more pronounced if we think that for most cultural tourist destinations in Greece (including archaeological sites and monuments) the collection of a fee is not required.

Despite all these, we cannot underrate the upcoming advantages accompanying quality tourism, such as:

- Creation of new jobs.
- Stabilization of the local economy.
- Improvement of citizens' living standards and of their quality of life at a local level, not only due to financial earnings but also by any other kind of direct or indirect profit.
- The conservation of cultural heritage.

What is requested therefore is to find the golden mean, according to the model of "sustainable development". Cultural goods should be more appealing and open to a greater number of people. Technological aids are suitable for such changes; GIS does a better job of sharing data and information than knowledge [7].

3. Alternative forms of tourism – the cultural tourism

Cultural tourism is nowadays recognized as one of the most important forms of tourist traffic in the world and its popularity and importance are being increased; people need to link themselves to ancient populations, to make all ancient habits as their own heritage and to feel proud with their history [8]. Cultural tourism is targeted to travelers of usually high educational and cultural level, who appreciate the treasures of the past.

It is obvious that cultural tourism has many positive effects on tourism development and reduces spoilage which comes along with mass tourism. This work is focused on the technical resources available in order to exploit this cultural capital. Greece (especially inland Greece) has many hidden cultural treasures, most of which are ready to be highlighted and protected and ready to be offered to local citizens and to the whole world; culture has to be lived [5].

Niemczyk [9] shows the importance of culture when deciding to visit a destination. Monuments and museums and everything that is close to culture are highly ranked and it is worth to use fresh technological tools for exploiting the cultural tourism.

3.1 The cultural routes

Shaping cultural routes is the most important means exploiting cultural heritage of the regions – in this case at European level. Along these routes, there are areas that are important from a cultural standpoint, such as attractions, monuments, and museums, which are either less known or even completely unknown to the general public. Cultural routes are networks, which sometimes integrate incoherent and isolated cultural resources. In these areas can coexist archaeological sites, museums of all kinds, fortifications, churches and monasteries, acquaintance with which refers to a type of tourism, both quantitatively and qualitatively different from the pattern of mass tourism, with specific quests and sensitivities. Niemczyk [9], quotes a matrix approach showing that cultural routes could be a useful tool in the hands of the tourists, which may enhance the popularity of reception of culture at the destination and attract even more people.

3.2 Cultural landscapes: The place of Kynouria in Arcadia

Kynouria today is the south-east regional unit of Arcadia. Figure 1 shows the exact area of Kynouria in Peloponnese (Greece). Historically, except for a short period, it was never a part of Arcadia. The dominant presence of mountain Parnonas and the sea have determined its character and historical destiny.

Figure 1. Map of Kynouria.

This region that now is administratively divided into two major sections, the Municipalities of North and South Kynouria, has a particularly remarkable cultural heritage, which is a combination of a natural environment of special beauty, almost intact from human activities. It is also a popular tourist destination.

The cultural importance of Kynouria covers the entire historical span, from prehistory until modern times. Never before has there been any effort to highlight any of these areas (with the exception of the famous Villa of Herodes Atticus in Eva) and the monuments are in most cases inaccessible. The proposal is not focused on a single area or monument but in a comprehensive, thematic treatment of monuments and sites, which date mostly from the classics to the Roman times, within the scope of classical archaeology [10].

The concept of "cultural route" is used here as a tool of exploitation of cultural heritage. The method followed is from the overall to the individual (top-to-bottom). Cities-ports of Kynouria is the subject of this work.

4. Materials and Methods

4.1 Model highlighted – General purpose and Main idea

Aksenov [11], highlights that assistance to tourists using tour guides offers a significant information filtering and categorization; the next step is to choose which of this information is relevant to their needs. For the case of Kynouria, in order to achieve the main objective that cannot be other than the protection of antiquities, a new standard of highlighting individual monuments and sites is proposed, having in mind:

1. the historical and archaeological data of the area,
2. the values that embody the ancient monuments,
3. the topography of the area,
4. data collected about the concentration of population and the economic activity, and
5. data collected about the existing tourism infrastructure.

Promoting the antiquities of Kynouria should be done on a new basis, as this area is a collection of medium and small-size archaeological sites. Grigorakakis [6], proves that these antiquities cannot be offered for local economic exploitation, but have to be promoted and protected based on the concept of "public goods".

The main principles for highlighting Kynouria's monuments should be:

- A design based on the values that these monuments embody.
- Mild elevation – accessibility.
- Networking – routes.

Complementary actions by the Greek Ministry of Culture and Tourism, the local authorities' infrastructure, the local communities and the private sector.

This work is aiming at creating some kind of a digital Museum, which will not represent any building, but the monuments themselves, as they are to their natural environment and provide the visitor all necessary information online, about how they can access them and what they can see. The impressions of the visitors are complete (anthropogenic and broader natural environment) and in an experiential way, as they are called to discover the monuments and be initiated in the history of the place.

The main scenario of the network proposed is:

1. to unify North and South Kynouria,
2. to highlight the residential patterns used,
3. to highlight the orientation of ancient citizens of Kynouria to the sea,
4. to highlight the strategic position of the region at the entrance of the Argolic Gulf and the eastern end of the Peloponnese between Argolida and Laconia, as a gateway, and output to and from Central and Southern Peloponnese,
5. to highlight in an embossed way the history conjuncture, either for Sparta and Argos, or for Sparta and Athens, or for citizens of Thiva, Macedonia, and Latin Rome, and

6. to highlight the natural environment of Kynouria and its unique natural beauties, which the visitors are called to discover, evaluate and protect.

4.2 Historical – Archaeological parameters – The present status

Kynouria's tourism product is diversified and includes both the natural and the man-made environment. It is very close to the center of Peloponnese, to popular leisure tourist destinations (such as Nafplio, Vitina and Argosaronikos islands) and to popular archaeological destinations (Mikines, Tirintha, Argos, Epidavros, Nemea, Sparti). West Kynouria is shaped with mountains; east Kynouria has many plains and beaches and the whole area has a unique cultural and historical heritage from prehistory until today, as Grigorakakis [6] analyzes in his work. Some historical key points are:

Citizens of Kynouria were amid two powerful Doric forces of the early historical times, Argos and Sparta, which both battled for the supremacy of the whole area.

The conflict for the predominance of the two major Peloponnesian forces took place in Kynouria.

Kynouria was intensely inhabited in antiquity along the coastline or at a short distance from it. Some of the proven archaeological places, where walls of cities-ports and acropolis were towered, are Tsiorovos, "Island" of Astros coast, ancient Eva, Cheronissi, "Island" of Saint Andreas coast, ancient Tyros, Plaka Leonodiou and Vigla Poulithron. Near these, we can meet the famous ancient temples of Apollonos Tyrita and Artemis Orthias, Polemokratous and Eva. Posterior monuments are Villa of Herodes Atticus and the buildings at the coast of Astros, Saint Anastassia, Plaka Leonidiou and "Island" of Saint Andreas.

The antiquities are arranged near the main road which is running through the coastline of Kynouria, from Xiropigado to Poulithra. Some of these antiquities have direct interconnections to this main road. This road ends to Astros and through the provincial road of Astros-Tripolis, interconnects to the highway of Peloponnese. Three main modern towns and many villages are very close to them (Astros, Tyros, and Leonidio); most of the local infrastructure is concentrated there and there is an increase in tourist traffic during the summer months. There are also ports and fishing shelters nearby (coast of Astros, Saint Andreas, Tyros, Plaka Leonidiou and Poulithra).

The natural environment has not been destroyed and has many beautiful Natura areas (as shown in Figure 2), wetlands, olive farms (in Pausanias' time) etc. Finally, two points of interest are the Archaeological Museum of Kynouria placed at Astros and the Open-Air Museum at Villa of Herodes Atticus in Eva of North Kynouria.

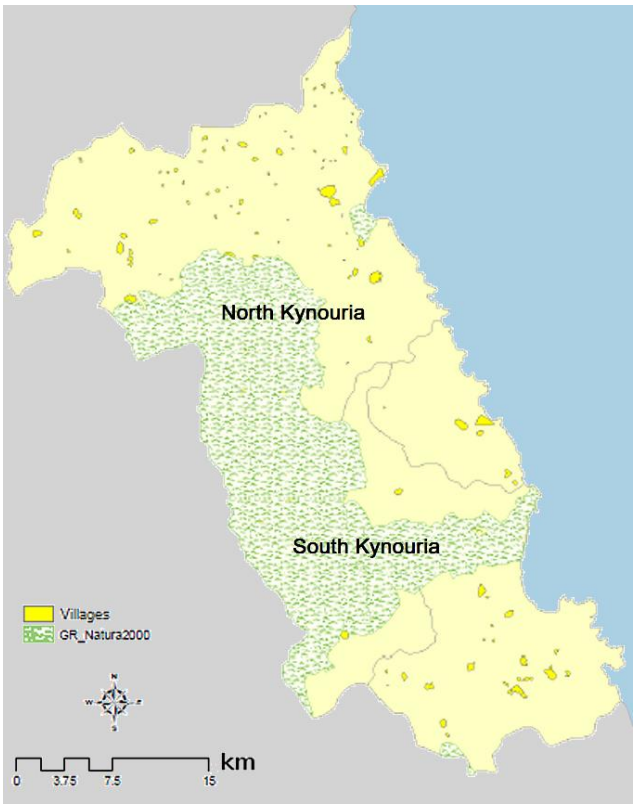

Figure 2. Natura zones of Kynouria.

4.3 The routes

A typical target user of such a recommender system is a tourist who is interested in exploring a (historical part of a) city and therefore would like to make a tour over this city or its part on a particular day. The tour involves visiting a number of points of interest (POI) – sites of specific interest to the tourist – that may be spatially dispersed across the city area implying that traveling may be involved in implementing the tour. The tour involves visiting a number of points of interest (POI) – sites of specific interest to the tourist – that may be spatially dispersed across the city area implying that traveling may be involved in implementing the tour. Points of interests can be logically linked with each other in a way that creates a particular storyline that the tourist will be interested to follow, which adds to the tour's cultural value [11].

For the case of Kynouria, Grigorakakis [6] analyzes the routes across the antiquities as follows:

1. "Cities: Acropolis – ports of Kynouria". This is the main route, which extends from North to South.
2. This main route is subdivided into three routes: two of them concern North Kynouria and the other is about South.

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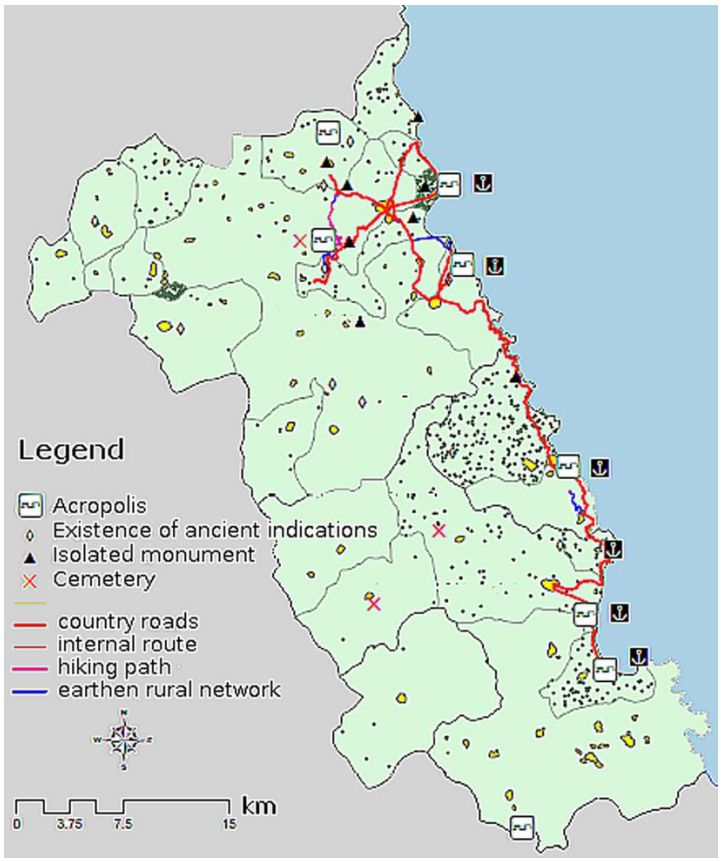

Figure 3. Routes, monuments, ports and fishing refuges.

Figure 3 shows in details all the monuments. Using villa of Herodes Atticus and the Archaeological Museum of Astros as the focal points, the following sub-routes are formed as mentioned below:

North Kynouria

1. Ancient Eva: according to Pausanias, this is the most important site in Thyreatida. This route includes the ancient acropolis in Tichio, Polemokration and the villa of Herodes near the Holy Monastery of "Metamorfossi tou Sotiros" in Loukou,
2. cities-ports of North Kynouria, which include "Tichos Aiginiton", "Kastraki" Meligous and the acropolis of Saint Andreas and
3. the defense network of Zavitsa, which contains the watchtowers of mount Zavitsa and the ancient acropolis of "Tsiorovo".

South Kynouria

1. Cities-ports of south Kynouria, which contains ancient Tyros, the ancient Acropolis at Plaka Leonidiou and Poulithra,
2. Ancient Tyros – the temple of Apollon Tyrita.

4.4 The technological tools

Creation of suitable databases and portraying their data in space are necessary steps. Latest technology, such as GIS, GPS and OMS (also known as web mapping) are very important tools for designing, data recording and mapping, correlations display and publishing the final result.

The use of GIS certainly reinforces this idea that science and practical problem solving are no longer distinct in their methods [7]. As shown by Latinopoulos & Kechagia [12] GIS has emerged over the recent years as an essential tool for spatial planning and management. Therefore, their application can be particularly valuable not only for visualization and data management but also for the assessment of choice alternatives, based on spatially related criteria.

The mass production process of the digital geographic infrastructure of a region and its constant maintenance require actions that have a methodology that certainly depends on who is going to use and utilize this infrastructure. However, almost always, a significant part of this infrastructure depends on the geomorphology, the physiography and all the data resulting from the intervention of humans around the region being studied. The conceptual model identifies the needs of the users, the objects that participate in the creation of the database depending on the theme of the content (in this case, archaeology) and the relationships between those objects, and finally, the form in which they will be represented in the database. A geographic database cannot contain a perfect description – instead, its contents must be carefully selected to fit within the limited capacity of computer storage devices.

The software of a GIS captures and implements general knowledge, while the database of a GIS represents specific information. In that sense, a GIS resolves the old debate between nomothetic and idiographic camps, by accommodating both. GIS solves the ancient problem of combining general scientific knowledge with specific information and gives practical value to both [7].

4.5 Geospatial data used

Geospatial data is used in critical decision making across industries, and it is increasingly important to understand an area of interest and utilize the data to make even more accurate spatial decisions. GIS lets us visualize, question, analyze, and interpret data to understand relationships, patterns, and trends. In addition, a GIS allows us to show relationships and trends and to model features to suit our needs. Layers in a GIS gives people the power to ask pertinent questions that drive development and develop scenarios, break down complex problems and devise strategies to make the process better [13].

Important information about the close relationship between the archaeologists and the information technology have provided by a related project held from Research Laboratory of Geospatial Technology at the University of West Attica in cooperation with the Ephorate of Antiquities in Arcadia [14]. Spatial analysis of the archaeological-historical data was introduced and an innovative archaeological interest geographical database application named “Calisto” is already designed and elaborated. “Calisto” cooperates with existing MIS related to the Greek antiquities. The establishment of this geographical database aims to facilitate the permanent needs of the archaeologists with regard to organization, management and documentation of archaeological finds in a particular administrative section of the country (e.g. for Arcadia and even more for Kynouria). “Calisto” designers implemented it with respect to the standards of the geographical databases, considering the needs of future users for the data management and the ability for managing, populating and updating the data. “Calisto” constitutes the infrastructure for the organization of the entire geospatial background of the Ephorate of Antiquities in Arcadia.

Our data was retrieved from the above database. We imported geospatial data from “Calisto” into ArcGIS online software by ESRI as shapefiles, containing the information we needed.

4.6 Accompanying data used

Geospatial data is being better understood – and this is a way of taking full advantages – when they are accompanied by some extra data, which are not characterized as “geospatial” but refer to it. In our case, this extra data consist of some digital photographs of the area of our interest and photographs or drawings of maps (stored as files on the computer). The digital frames of the areas are taken “on-site” in a way that describes specific information concerning each antiquity. It is suggested these photographs to be taken either by professionals or photographers accompanied by archaeologists – or at least by the archaeologists themselves – in order to imprint the right monuments using the correct perspective and the appropriate dimensions, resolution and color depth. That is why we used digital photographs. Some examples can be seen in Figure 4 and Figure 5.

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Figure 4. Some digital photos were taken from the areas of interest (filmstrip effect) [6].

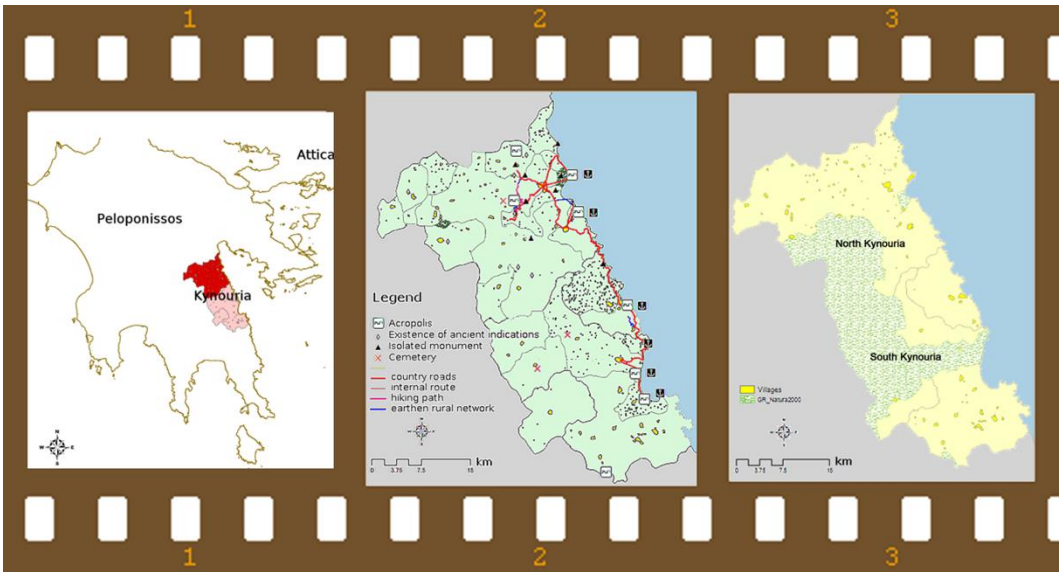

Figure 5. Examples of map's drawings (filmstrip effect).

4.7 Software implementation

A software implementation is needed to extend the entire idea to the final user. The best solution would be an implementation, which could be available online and managed by a portable device, such as a smartphone, a tablet or even a laptop. With the recent advancements in technology, the proliferation of the internet, and the adoption of mobile and pervasive computing paradigms recommended systems for tourists have also joined the world of mobile devices and have become available on the fly [11].

When all data were compiled, they were transformed into digital form using the advantages of the "Calisto" geographical database. Some information about this special-purpose database is given below.

4.7.1 Choosing a GIS software

Once all the necessary digital maps had downloaded and collected, a suitable GIS software, ArcGIS online, was used to manage them and produce the final maps. ArcGIS by ESRI™ provides a free online platform for including maps and scenes and allows users to explore and understand the geographic data. The interactive maps found in ArcGIS allow exploring, visualizing and understanding data in 2D. Data-viewing tools, such as pop-ups, legends, and filters, allow focusing on the important data. The idea of serving application using 2D maps is not something innovating; in general, 2D mapping applications provide an intuitive interactive and visualization environment for users [16].

4.7.2 Configuring ArcGIS online

We did not use any of the included maps of ArcGIS online, but we created a new web map and imported our shapefiles as layers, performing all necessary modifications to produce our final main 2D map of Kynouria (as seen in Figure 6). This final web map contains suitable bookmarks, which zoom to specific areas. The final map also contains some useful navigation controls:

- Zoom in and zoom out buttons (it also supports the mouse and scroll wheel, the arrow keys on the keyboard and press-and-hold of the Shift key and then drag a box on the map),
- Zoom the map to its initial extent and also browse the map to a predefined extent through a bookmark (as already described above),
- Pan, using mouse and scroll wheel or the arrow keys on the keyboard,
- Find a current location (GPS sensor is required).

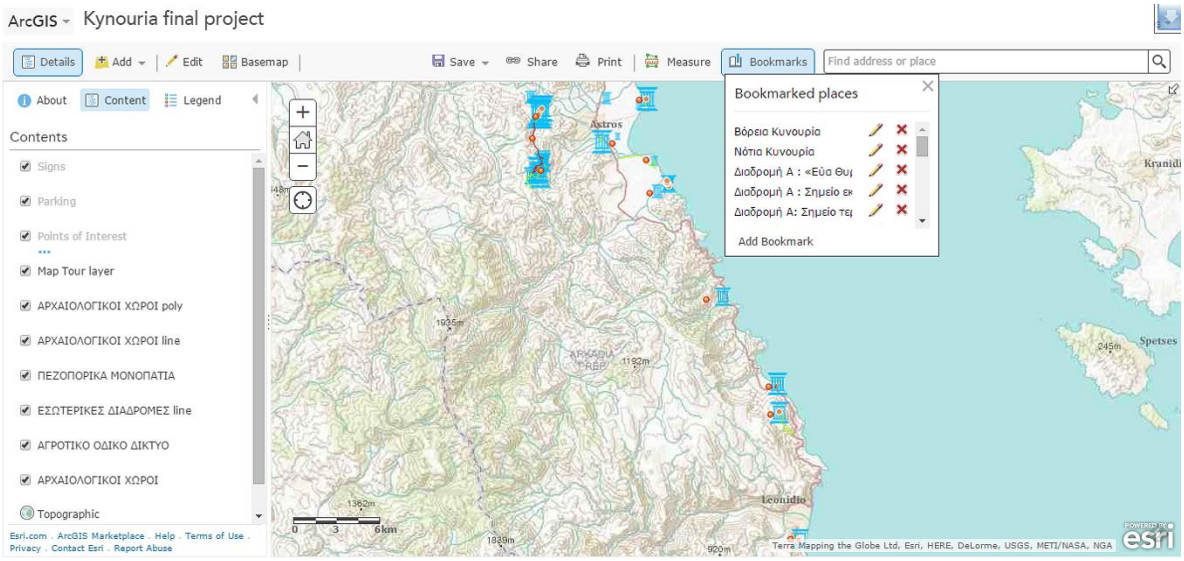

Figure 6. Kynouria: final web map using ArcGIS online.

Some other features which we have enabled are:

- View a legend, which displays the meaning of the symbols used to represent features on the map.
- Measure. When using the main map, the area of a polygon and the length of a line can be calculated. The coordinates of a point can also be found. The map viewer calculates the shortest distance (using the ellipsoid-based geodesic calculation). Before or after performing each measurement, the user can change the default units of measurement. Figure 7 shows such an example for calculating the Euclidean distance between Astros and ancient Tyros.
- Share the map, by sending an email with a link, posting it on a Facebook or Twitter account or embedding it in a website or blog.
- Select a base-map. A base-map provides a background of geographical context for the content that must be displayed in a map; the user can choose which base-map to use and change the base-map of the current map at any time by using the base-map gallery.

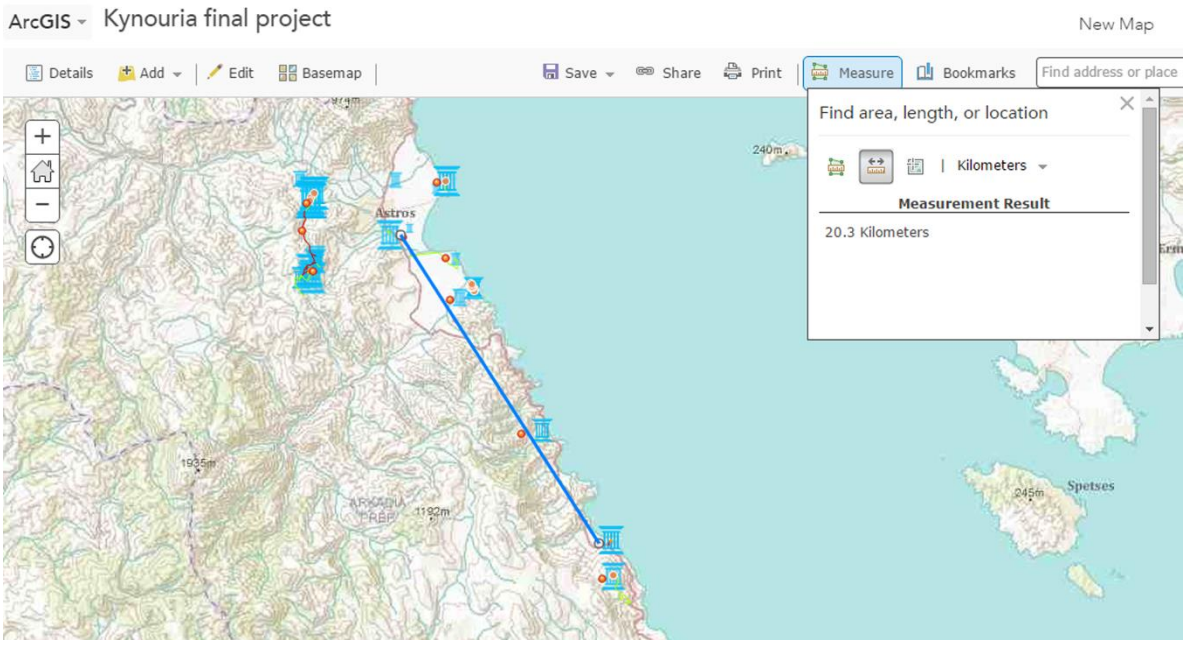

Figure 7. Calculating Euclidean distance in our web map using ArcGIS online.

We had to create three more main web maps based on the main web map, one sub-main map for each sub-route, and use them in our final web application. All features and navigation controls described above are available for all these web sub-maps. Finally, we created some web applications, based on the above web maps. Web applications were necessary to provide more information in a friendly way. We created different configurable apps which offer various bits of functionality, such as different layouts and color schemes, editing and identify tools, social media feeds, side-by-side map viewers, and so on. Web applications use built-in JavaScript APIs. Specifically, three web applications were created for the following needs:

1. A base-map web application, to be displayed at the front page of our final application.
2. A storyboard, which is something like a guided virtual tour and contains text information about all antiquities, including photos.
3. A map journal, which demonstrates a classic printed map, containing information in text and image presentation of grouped routes. It is obvious that we created the three sub-main web maps described above in order to create this map journal web application.

4.7.3 Setting up the application

ArcGIS online gives many choices and excellent outputs, but there was a need of serving all these results to an independent and stand-alone application. The best solution was to create a client-server application. As we did when choosing the open-content solution of ArcGIS online, which supports free use, we preferred again a complete open-source solution: a piece of software for a local web server, a suitable database, and a CMS. For our local web server implementation, we chose XAMPP; for CMS, we chose Drupal; a typical MySQL database, created and managed using PHPmyAdmin, fills the package. In general, the whole functionality of our application is imprinted to the diagram of Figure 8.

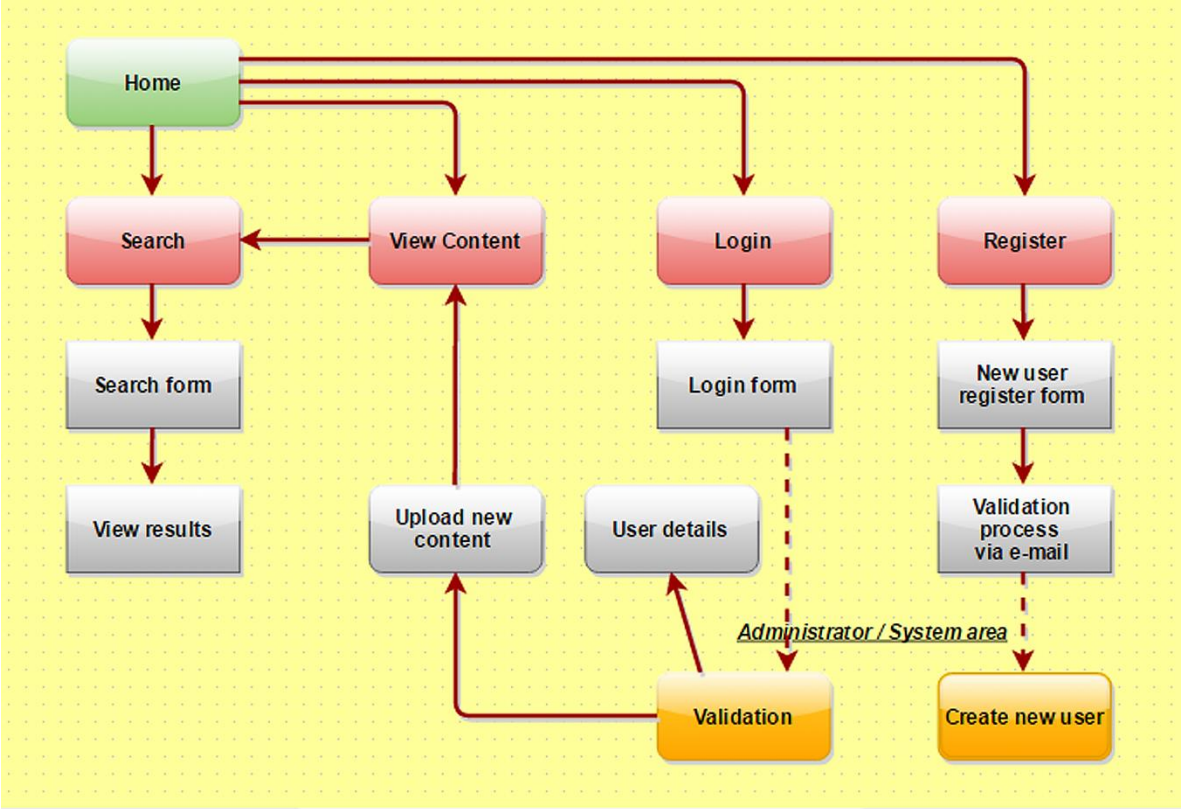

Figure 8. General schema of our final web application.

In Figure 9, a compact UML diagram shows the available roles and the interaction between them. Application settings and functionalities that were enabled in the design mode of the maps are also available in the final web map application embedded in the home page: routing (in use only if a GPS sensor is available), measure tool, base-map selector, find location by address and "find my location" (in use only if a GPS sensor is available). The application is currently in Greek. The zoom tool provides extra optical information to the user, such as the exact place of the monuments, lines, and polygons referring to the antiquities, main and rural roads, hiking trails, inner tracks, signs, available places for parking, points of interest. Extra information is revealed at different zoom levels. The user can change the base-map and choose what supplementary information he wants to see, which is available as open-content by ArcGIS online. Pop-ups also are enabled; the user can click on a specific site and view some initial information. Pop-ups are displayed only when the user clicks on a monument and disappear when another pop-up is displayed.

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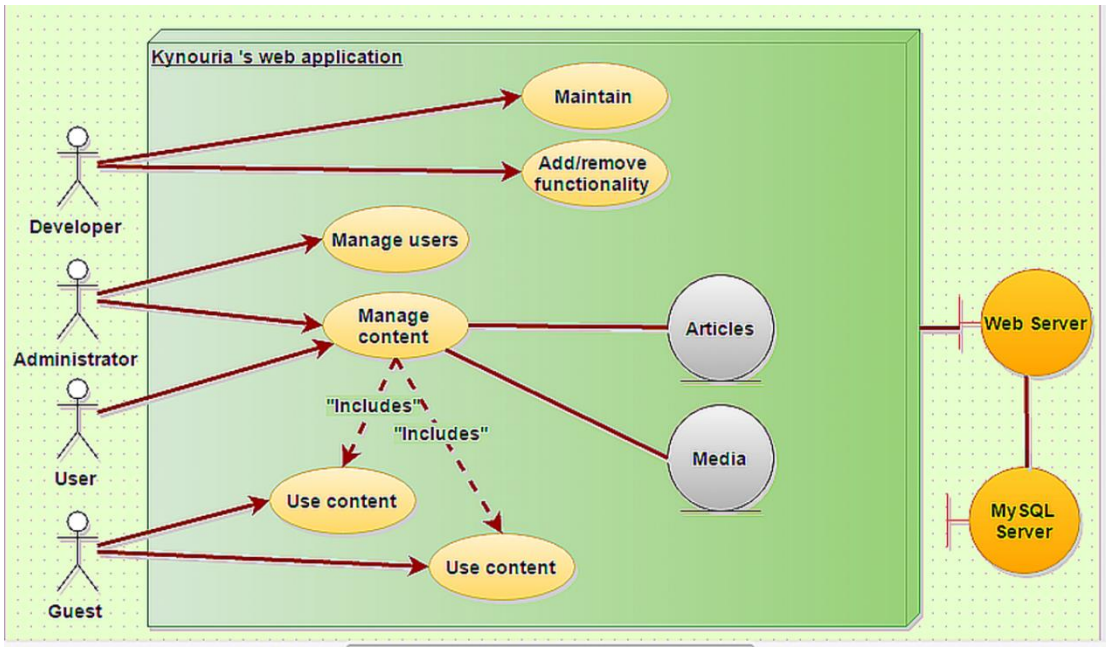

Figure 9. UML diagram describing our project.

4.7.4 Why open-source?

Gamalielsson, Reilly & Williams, and Hepburn [16], [17], [18], mention some of the advantages of using open standards, which suit to our case study: we have the minimum risk of being technologically locked-in, while we gain interoperability, long-term access and reuse of digital assets. There was no need to lock our source code and we wanted to use freely available and customizable open-source code, with open access available to all; that's how we realized about highlighting and serving of a "public good". That's why we chose Drupal as our main software background, which not only promotes its advantages in scalability, personalization, user management, database management, the creation of innovation platforms and so on [19], [16].

In fact, there are some CMS that are open and designed especially for cultural applications. Caffo [20] mentions "Museo&Web" [21] and MOVIO, and informs that Museo&Web" is a stable and open-source CMS especially devoted to cultural institutions (e.g. museums, libraries, archives) that want to build a website, using specialized software modules. For cultural institutions, ICCU created a new application to develop virtual exhibitions online which was made possible thanks to the MOVIO project. MOVIO developed a toolkit that consists of an open-source CMS for the creation of online virtual exhibitions, the equivalent version for mobiles (iPhone, Android for smartphones and iPad), the version of App for popular mobile platforms (iMovio) and online tutorials and training.

Although "Museo&Web" is stable, updated and improved, has a great active Google support group [22], and could be a preferred solution for specific needs, we faced a problem: website and the tutorial of "Museo&Web" was not multilingual; it spoke only Italian at the time of the project. As for "MOVIO", there was not a website to download and use it while we were preparing the project.

5. Results

5.1 Story (and photo) map tour

Story map tour is a more attractive collection of points of interest that are numbered on the map. This section of our project has twelve such points, representing the main sites of each route. Different colors are used to separate the routes (Figure 10a). The points are numbered in a way that

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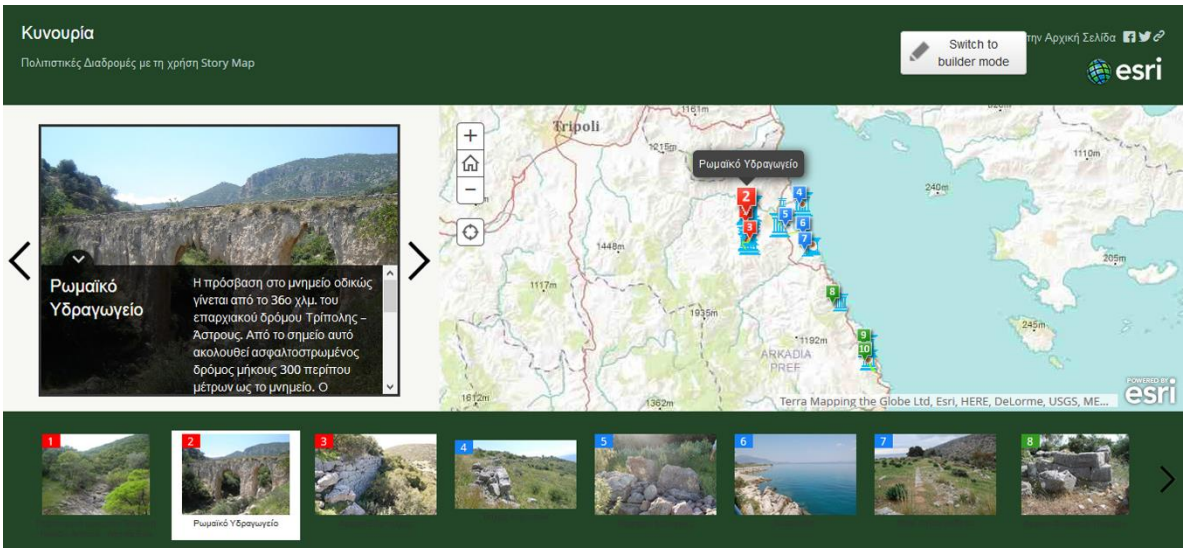
the smaller number represents the beginning of the route and the bigger represents the end of the route.

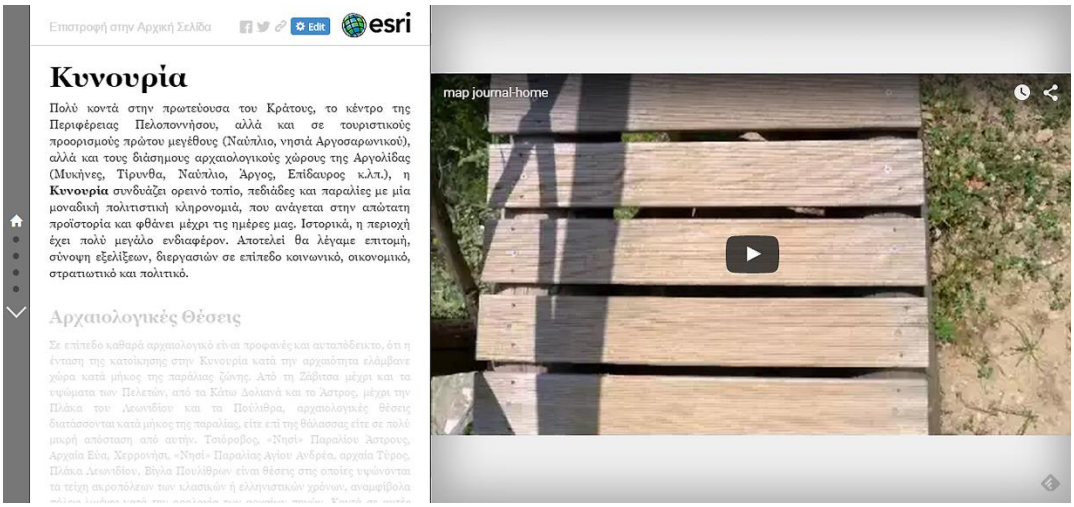
As mentioned above, this is an HTML page and its role is to offer an attractive way of a virtual touring, without providing mass information neither by text nor by images. After following this tour, the user has a primary acquaintance with ancient Kynouria, which is compact, but not poor, because it offers a very good initial package for touring, containing geographical and archaeological knowledge.

5.2 Map journal

The last feature of our project is the map journal. It is another HTML page, the content of which is focused on the routes. The main idea is to create something like a digital journal, where the user can combine the reading of the text and watching small videos (which in fact are slideshows with photos of each route, converted to ".mp4" video format) (figures 10b and 10c).



(a)



(b)

(c)

Figure 10. (a): Story (and photo) map tour, (b): Map journal: home page, and (c): Map journal: an example of a route.

5.3 Expected Results

The results expected could be summarized as follows:

1. To have access to information on the design, structure, and organization of cultural routes in Kynouria.
2. To search information material on the history and archeology of Kynouria and download maps on the proposed cultural routes.
3. To view and copy or download the coordinates of these routes, using a portable GPS navigator, in a way that accessibility becomes easier to specific monuments, archaeological sites or places.
4. To suggest where someone can begin visiting sets of antiquities and how these can be reached, using a portable GPS navigator.
5. To have access to photographs related to the monuments and to photographs associated with the route to be selected to follow.
6. To have access to findings from the archaeological sites to be visited and to findings from the Archaeological Museum of Kynouria.

This work relies on scenarios processed by archaeologists, so it is a multimedia application which somehow attempts a documented reconstruction of the history of the area. In this process, GIS has a main role in feeding this application with its results, and the application would simultaneously receive all the necessary archaeological information (texts, images, designs etc.). In this way, the necessary scientific documentation will be achieved, while the scenarios will be interlarded, in order to make them appealing to visitors.

This web application will be 100% useful and functional if the authorities decide to install Wi-Fi hotspots with free internet access in selected locations (e.g., Archaeological Museum of Kynouria at Astros, Loukou, Tyros, Leonidio).

6. Conclusion and Future work

The web application under discussion aspires to be functional, simple to use and scientifically accurate regarding the data included. The role of the internet in highlighting and promoting monuments and cultural routes is important, especially when geospatial data is used online for smart portable devices, serving searching capabilities to people who love nature and have specific archaeological interests. The goal is to use personalized solutions to highlight cultural heritage as a public good and improve cultural tourism's experience.

A prerequisite for the full implementation of this web application to become even more attractive and useful is to include:

- even more historical and archaeological informational package (such as more text, maps, and photos),
- the ability to search for accommodation, travel packages or other benefits,
- the ability to search for stores of sanitary interest, for Museums, for traditional villages etc.,
- even more complete information about how some points of interest can be accessed,
- other attractions worth seeing the visitors under the proposed routes, but also in their wider catchment area,
- announcements of all the events that took or will take place in the context of scientific and educational activities of the Archaeological authority in the area,
- the ability to download reputable books and audio files – both as tour guides for the area and the route that a visitor chooses to follow,
- access to happenings and events that local communities are organizing,
- access to web pages of local authorities, local government, local blogs etc.
- searchable sanitary shops, museums, traditional villages and so on, all provided by a static and dynamic way, fully exploiting the capabilities of geospatial databases and interactive digital cartography,
- automatic multilingual support or manual full translation into other languages.

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