

Web Technologies and Services in the Course of Development of the Interactive Route «Upland Crimea»*

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Abstract. In the article, the overview modern geographical the Internet (web) of services that can be used in the course of studying geography and cartography is carried out the practical application of geoinformation Internet services and applications for development of series of excursion routes is described.

Keywords: web service, geo service, on-line application

1 Introduction

Now in professional activity at the implementation of modern technologies various developments and advanced software products are more and more applied. For free, or conditionally paid cloudy applications and web services which program and hardware requirements do not assume existence at clients of high-performance and energy-consuming computers are offered to users access to the resources. [1, page 21].

Geoinformation services (GIS-services) are web services providing access to space data, their processing, analysis, search, and visualization. Now allocate the following types of GIS-services [2]:

- cartographic service - provides access to card contents, including separate layers, objects, and attributes;
- service of images - provides access to sets of raster data, including values of pixels, metadata, and channels;
- geocoding service - runs for the search of objects on the card to the address, the definition of the address of the point specified on the card;
- service of geo data - provides access to the content of the base of geodata for requests, extraction, and replications of data;
- service of the network analysis - analyzes transport network (creation of optimum routes);

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- geoprocessing service models and analyzes the space relations (makes flood distribution forecasting, the analysis of patterns of emergence of outbreaks of diseases, etc.).

The text represents the material necessary for complete disclosure of all sub-themes entering the excursion. The text is urged to provide the thematic orientation of the story of the guide, in it a certain point of view on the facts and events to which excursion is devoted is formulated; the objective assessment of the shown objects is given.

Requirements to the text: brevity, clearness of formulations, the necessary amount of the actual material, existence of information on the subject, complete disclosure of the subject, literary language.[3]

The text of the excursion is formed the creative group when developing the new subject and executes control functions. It means that each guide shall build the story taking into account the requirements of this text (the control text).

The control text in most cases contains the chronological statement of material. This text does not reflect the structure of excursion and is not under construction in route sequence, with the distribution of the stated material on stops where there is the analysis of touristic sites. The control text is the material that is carefully picked up and verified on sources being the basis for all tours conducted on this subject. Using provisions and outputs which contain in the control text, the guide builds the individual text.

Based on the control text options of excursions to the same subject, including for children and adults, different groups of workers can be created.

For simplification of work on the creation of such options, the control text can include the materials connected with the objects, sub-themes, and the main questions which did not enter the route of this excursion.

In addition to materials for the story of the guide, including materials that shall make the maintenance of the opening speech and the conclusion of the excursion, and logical transitions in the control text. It shall be convenient for use. Quotes, digits, and examples are followed by links to sources.

2 Evaluation

The route of excursion represents the most convenient transit of the excursion group promoting disclosure of subject. It is under construction depending on the most correct sequence of a survey of objects for this excursion, the existence of platforms for the arrangement of the group, need for the safety of tourists. One of the problems of the route is to promote the fullest disclosure of the subject. The main requirements that have to be considered by originators of the route are the organization of display of objects in a logical sequence and providing the visual basis for disclosure of subject. In the practice of excursion establishments, there are three options of creation of routes: chronological, thematic, and thematic-chronological. The excursions devoted to the life and activity of outstanding people can be an example of the chronological creation of routes.

By the thematic principle, the excursions connected with disclosure of certain subjects in city life are constructed (for example, "Arkhangelsk is under construction",

"Literary Moscow area", etc.). All sightseeing city tours are constructed by the thematic-chronological principle. The sequence of the statement of material on chronology in such excursions is observed, as a rule, only at the disclosure of each sub-theme. Development of route is the difficult multistage procedure demanding rather a high qualification and being one of the basic elements of technology of creation of new excursion. When developing the bus route it is necessary to be guided by "Traffic regulations", "The charter of the motor transport", "Rules of transportation of passengers" and other departmental standards. Objects depending on the role in excursion can be used as the main and additional. The main objects are exposed to deeper analysis, on them excursion sub-themes reveal. The display of additional objects is, as a rule, carried out when moving (transitions) of the excursion group and it does not hold a dominant position [5].

The route is under construction by the principle of the most correct sequence of the survey of objects and is planned to take into account the following requirements:

- display of objects should be carried out in a certain logical sequence, without allowing unnecessarily repeated drives on the same side of the route (the street, the square, the bridge, the highway), i.e. so-called "loops";
- existence of availability of object (the platform for its survey);
- moving or transition between objects should not take 10-15 minutes that there were no too long pauses in display and the story;
- existence of well-planned stops, including sanitary and places of the parking of vehicles.

It is recommended to have several options for the movement of the group by the time of carrying out the excursion. The necessity of a change of route in some cases is caused by transport "traffic jams", repairing work on city highways. All this has to be considered during the creation of various options of the route. Development of bus route comes to the end with approval and the approval of the passport and the scheme of the route, calculation of distance in kilometers and usage time of motor transport.

During the research, we carried out an extensive search, the detailed analysis, and the geoinformation (GIS) services and systems provided to users on means of the Internet are considered. The services described below have a set of essential functions necessary for studying geography, cartography, tourism, and navigation.

The most widespread and demanded cartographic service is Google Maps (www.google.ru/maps/) - it is simple in development and has possibilities of the opening of access to personal online maps and joint editing. One more project of the Google company - the virtual globe - the Google Mother Earth (Google Earth) (www.google.com/earth/) is not less known. The slogan of the project: "The whole world is open before you". These services are connected and are an integral component of the process of studying geography and cartography. In addition, cartographic projects of the Google Company are not less curious services - Google the Moon (www.google.com/moon), Google Mars (www.google.com/mars), Google Sky (www.google.ru/intl/ru/sky) [1].

It should be noted the Catalogue of online maps on the website of the National geographical society (maps.nationalgeographic.com/maps) as an official online resource

of cartographic geo data.

A specific place in our overview is held by the Russian geographical Internet services such as:

- The world of Cards (www.mirkart.ru) - portal of interactive maps of the cities and countries;
- eAtlas (www.eatlas.ru) - cartographic directory service of the Russian development;
- Yandex. Cards (yandex.ru/maps) - the cartographic service of the Russian search portal of Yandex, has the built-in project - the Designer of cards (Yandex) (yandex.ru/map-constructor) allowing to put route, to measure distances, to draw polygons, to plot points site [3] necessary to you;
- The National card (n.maps.yandex.ru) - the Russian analog of Wikimapia, is also a service of Yandex;
- SASPlanet (www.sasgis.org/);
- GeoMixer (geomixer.ru/index.php/ru/);
- 2GIS (2gis.ru) - the Russian international cartographic company founded in Novosibirsk. Since 1999 publishes electronic reference, books with maps of the cities have both detailed commercial and social information [2].

In the course of studying geography, separate attention should be paid to the on-line geographical encyclopedia designed by the example of the open Internet encyclopedia Wikipedia - Wikimapia (Wikimapia, in abbreviated form BM, WM) (wikimapia.org). The slogan of this project: "Let's describe the whole world!" The project purpose - to note and describe all geographical objects on Earth. Wikimapia combines in himself an interactive map with the principle of free editing Wicky [4].

One more project similar to the previous - Open Street Map (www.openstreetmap.org), in its data, are collected from personal GPS trackers of the users providing information on aero photography, satellite pictures, videos, and panoramas of streets. It is considered that some information is more actual than in Google Maps.

Let us consider the following services that can be used in the course of studying geography at any steps of training:

- GISFile (gisfile.com/index.htm) - social GEO-info-service;
- TripGeo (tripgeo.com) - this service is interesting in that it allows not only to lay track according to the card but also to see how it will look in reality. TripGeo uses data of Google Maps and Google Street View and combines them in one interface, allowing them to make the virtual trip along the chosen route [3];
- Scribble Maps (www.scribblemaps.com) - online service;
- TripToMap (triptomap.com/ru) and ZeeMaps (www.zeemaps.com) - the services allowing tourists to exchange new ideas of routes for travel in the form of beautiful, interactive maps [2, 7];
- Bing Maps (www.bing.com/maps) - uses data from Nokia Maps;
- QuickMaps (www.quickmaps.com/) - instant creation of cards;
- Earth Explorer (earthexplorer.usgs.gov/) - search of satellite images from 1972 till present;
- HERE WeGo (wego.here.com) - service for the creation of route.

In our opinion, the services suitable for the creation of multimedia presentations are fascinating Tripline (www.tripline.net) and Animals (www.animaps.com).

The main leader of GIS-technologies is the system for the creation of GIS of any level - ArcGIS (www.arcgis.com). This product needs to pay much bigger attention, than the mean framework of our article as the system is a professional and licensed product about the online version. We will provide alternatives of ArcGIS with free code: QGIS (Quantum GIS) (www.qgis.org/ru/site/); gvSIG (www.gvsig.com/en) and GRASS (Geographic Resources Analysis Support System) (grass.osgeo.org/).

In the course of training or studying geography, various games and the mobile applications developed for tablets and mobile devices are used: Interactive atlas of GeoMaster Plus (geomasterapp.com/); MAPS.ME. (MapsWithMe) (till November 2014 - Karty@mail.Ru) (maps.me/ru/home) - a Russian application, the free cartographic service provided by the Mail.Ru company for mobile applications; EarthViewer (blogs.agu.org) - mobile application from Google using which it is possible to learn how our planet looked billions of years ago. Each object on the card contains historical and geological information [4].

The mobile game quiz Geography Learning Game (www.geography-map-games.com/) and the geographical games Smarty Pins - (smartypins.withgoogle.com), GeoGuessr (www.geoguessr.com) will help with the game form to gain the necessary knowledge in the field of geography. Educational mobile applications - Ansel & Clair's Adventures in Africa and Stack the Countries will be suitable for younger school age. The web application of GeoGuessr (reesiepielangs.files.wordpress.com) is an excellent resource to apply service at the end of occupation and to compare results.

There is still several unique services, each of which can brag of the features in the field of studying geography: StoryMap JS (storymap.knightlab.com/)- service which allows creating the whole stories from cards; weather Windyty globe (www.windytv.com); historical GeaCron card (<http://geacron.com>); service for the creation of cards - CartoDB (carto.com/).

In conclusion, it should be noted that the variety of the geographical network services considered by us allows choosing individual trajectory of training or studying geography at various stages of education - from preschool - to the highest. Many of them duplicate the functionality of each other, many are English-speaking that can serve only as plus for binary occupations (English plus geography), some, can become universal assistants for teachers and pupils in the course of studying geography and cartography.

3 Results

Development of the interactive route consisting of several blocks which we called "the Mountain Crimea" became the purpose of our research. As the main incentive of performance of objectives on the creation of the above-named route acquaintance with picturesque places of the Mountain Crimea and the Crimean coast which were visited and passed with standard and specialized mobile devices served. We will consider two

route sites in more detail: Descent from the mountain Ah-Petri (Taraktashsky and Botkin tracks) and the site from Balaklava to the Laspinsky pass relating to the tourist route which consists of eight sites of different duration and complexity - the Big Sevastopol track.

During the passing of walking routes, we used the tourist navigator for a record of tracks. Also, the Google Maps version for mobile phones with function - Google Latitude (the free application tracing location of the mobile phone without GPS) was installed in mobile phones.

Employing the above-mentioned Google application of Latitude, we wrote down the track of the first site of our excursion route - Descent from the mountain Ah-Petri (Fig. 1).

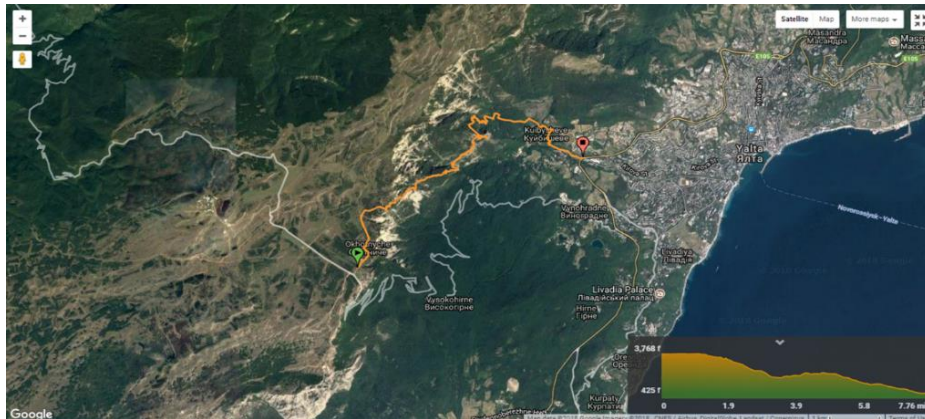


Fig. 1. The Ah-Petri descent

This route lasts about 4 hours and is subdivided into 2 main tracks - Taraktashsky and Botkin. "Taraktash" in transfer into Russian means "stone comb". The track is the shortest descent from the mountain Ah-Petri and passes by Stavri-Kai's <<http://idem-v-pohod.ru/stavri-kaya>> rock on the gorge. It connects uplands Ah-Petri and one of the most known Crimean falls Wuchang SU. From Falls to the Glade of fairy tales descent continues on the Botkin track.

The interactive project along our second route was developed by the State autonomous city institution of Sevastopol "Center of development of tourism". The main route about 130 km long of radial character from Sevastopol to Balaklava - from the coast of the Black Sea through the central part of Crimea. The route consists of eight sites which are linearly located one by one. Each of these sites is a fine independent walking route lasting from two until eight o'clock with different complexity (Fig. 2) [5].

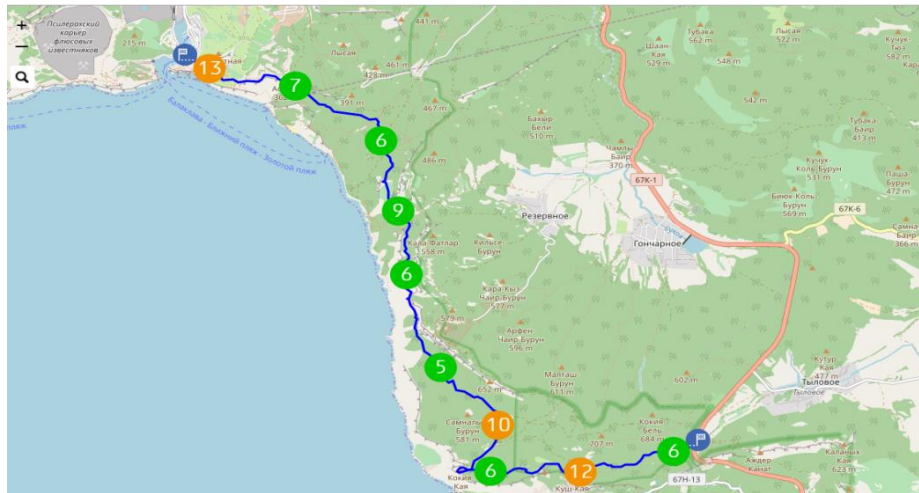


Fig. 2. The Big Sevastopol Track project

Previously having studied the route using the above-mentioned resource, we passed the site to the Laspinsky pass (Fig. 3).

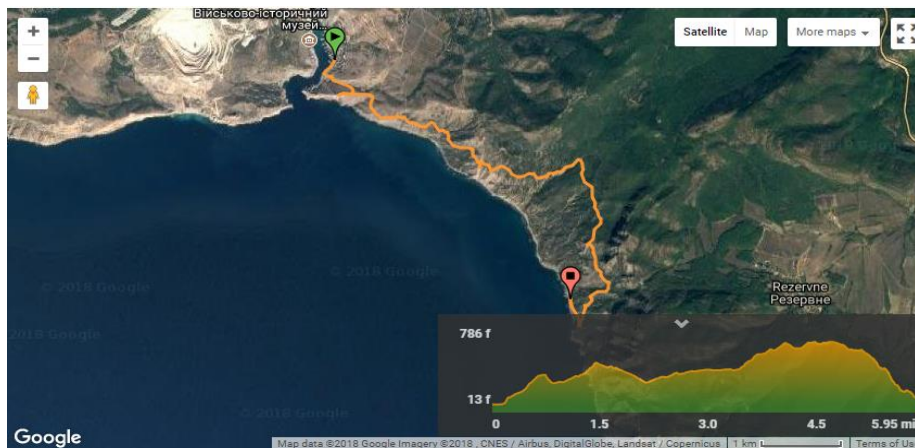


Fig. 3. The Big Sevastopol track

The use of the obtained data found the reflection in the creation of the interactive excursion route "the Mountain Crimea" consisting of several sites: "The cave cities of the Crimea (on groups)", "the Big Sevastopol Track", "Descent with Ah-Petri", etc.

For the creation of an interactive excursion, we used the Designer Kart of Yandex application of yandex.ru/map-constructor (Fig. 4).

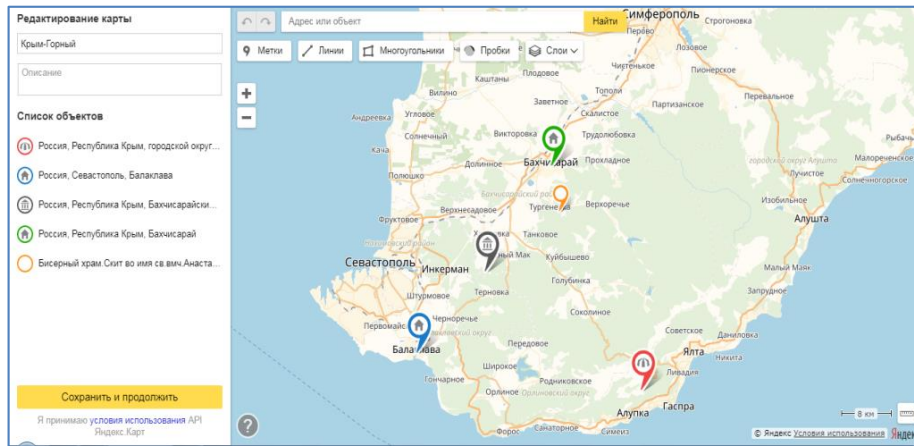


Fig. 4. The "Upland Crimea" route in the Yandex Maps application

For comparison, the same data were transferred to the Google maps appendices (Fig. 5).

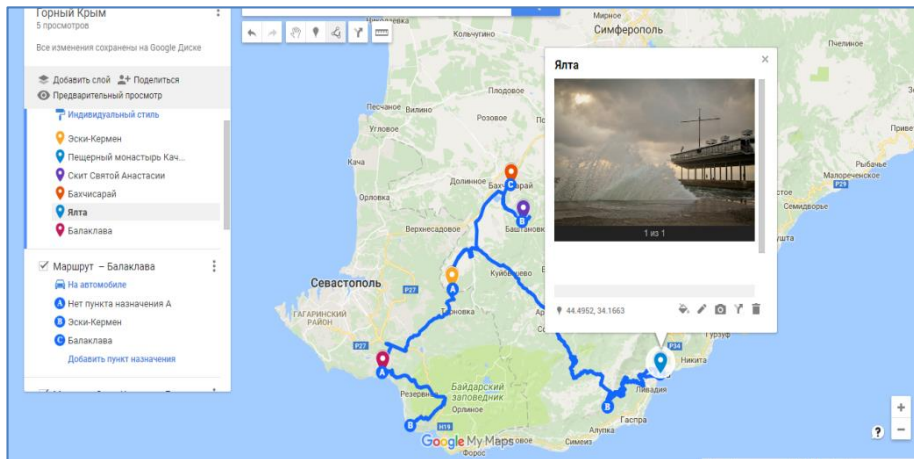


Fig. 5. The "Upland Crimea" route in the Google maps application

The received card has more expanded opportunities allowing to attach materials, to lay and calculate a route with changes of vehicles, etc. to places of photo and video.

4 Conclusion

The conducted researches will allow concluding that the Google maps service is suitable for the solution of objective on development of interactive excursion routes in the greatest way, and use of mobile applications, such as Google Latitude, these routes become more accurate. For the help in the organization of excursion the methodical

development stating requirements of excursion technique taking into account features of the shown objects and content of the stated material was created. Here are specified: duration, extent, type, and type of excursion, maintenance, purpose, tasks, route of the excursion, the feature of the technique of carrying out excursion, and general organizational instructions. The integral part of the development of this route is occupied by the possibility of its advance. For this purpose, we analyzed ways of giving advertising in the tourist sphere, and the most effective are chosen.

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