

Geoinformation technologies for tourist's travel support

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Abstract – In this paper the analysis of researches and developments of geographic information technologies for tourist's decision support was provided. The necessity for development of geographic information technology tools was proved to provide personalization, optimization and support for tourist in all phases of his travel using mobile technologies of combined with GIS functionality.

Key words – geographic information technologies, GIS, tourism, travel support, mobile technologies.

I. Introduction

The tourism industry has quite a lot of research and application problems in the solution of which is necessary to decide on the relative position of objects in space, routing, determining their length and complexity, optimal route selection etc. [1,2]. Modern analysis of spatial distribution facilities based on the use of geographic information technology (GIT). One of the promising areas of research is the application of geographic information systems (GIS) to help tourist at all stages of his journey.

II. The purpose and tasks of the research

The main tasks solved with the help of travel GIT are: creation of electronic versions of popular tourist destinations; definition of tourist's location, facilities, vehicles, etc.; forming of a tourist's route; maintenance of tourist travel; trip planning; virtual tourism, 3-D versions of tourist sites; thematic digital maps; dissemination of information on touristic facilities; analysis of tourist flows and spatial distribution of tourism resources; search diverse information in the field of tourism.

Different categories of tourists can use a variety of GIT at all stages of the trip:

- During preparation for the trip using GIT one can search data on touristic services, destinations, tourist infrastructure facilities; make planning a trip routing.

- When traveling with a mobile tourist application based on GIT are available options such as location tracking, search tourist facilities, maintenance and adjustment tourist route [2].

- After traveling touristic GIT allow you to perform data analysis on tourist flows, the formation of reviews and evaluations, the exchange of experience (in many mobile applications are tools for creating voting and rating the quality of services, etc.) [1].

Leaders in the development of global GIS now are the products of two companies - ESRI ArcGIS and MapInfo Corporation INTERGRAPH. Also, for the implemen-

tation of touristic GIS-platform applications often are used GoogleMaps [1]. To implement some specific tasks, such as virtual tourism are created specialized GIS platforms, such as Cyber GIS [3].

III. Travel support GIS applications

Decision support tools targeted to the specific needs of tourists and travel agents nowadays are developed and improved in the direction of mobile and web-based applications. Among them - the tools to solve the problem of personalization, optimization and maintenance of tourist during his stay on the route.

Most mobile applications, travel guides and programs require the provision of tourist in space. The unsolved task remains to determine the exact location of the tourist inside buildings, palaces, museums, historical or cultural complexes. To program guide automatically started and began the story of a particular memo or picture, you need to know not only exactly where is a tourist, but also in which direction he is looking and where he is going to move on. Finding the external location of the user can be realized using GPS. Once tourist's positioning is located with GPS, you can practically define the objects that the user is watching at any given time. However, no effective information technology for solving the problem of determining the coordinates of tourist location as well as individual objects, such as inside a large museum. This would give an opportunity to develop a software solution in combination with a program-guided, GPS-transmitter and GIS system, which offered to tourists - the owners of mobile personalized tour in real time [4].

The original solution to the problem of creating and correcting the travel route is a mobile application based on GIS and multi-agent systems [5]. In application were used geospatial information with commercial GIS formats such as ArcGIS and Mapinfo. Performing the transformation of geospatial data in GML makes it possible to ensure the flow of geospatial data to users of portable devices freely without commercial plug-in software. The authors of the study focus on creating and implementing multi-agent system of choosing the best route.

The study [6] based on ArcGIS Software ESRI 10.1 developed thematic digital maps containing information about hotels, guest houses, tourist routes, airports, railway stations, parks, churches, playgrounds, golf courses, hospitals, locations of ATM, restaurants, gas stations, police stations and entertainment facilities of Srinagar (India) for further integration with the web space to promote a tourist with information and assistance to potential tourists in their decision on travel itinerary respective regions. Digital maps, satellite images, GPS and statistics were used to create data layers above and were then combined with additional materials such as multimedia video clips, audio stories and photos.

The study [7] solves the problem of getting personalized recommendations for tourists on daily excursion routes. The approach authors proposed is that for pre-formed user list attractions, that travelers like to visit, get the route for each day of the visit. The long journey shares on separate days and a list of attractive tourist destinations are formed. They are grouped

thematically or geographically distributed and between these days. Places of possible interest are selected from these conventionally implied or user preferences. The described method allows the individual to plan personalized tours daily based user preferences, the time allotted for the tour, availability to visit monuments (timetable, agenda), the number of days of stay.

Governments in countries with developed tourism markets are extensively interested in creating services to provide personalized information services to tourist's. As an example, in Thailand was performed a study intended to facilitate tourist travel search sites and trip planning. The application is designed in such a way that relevant database may be applied in other regions. The structure of the software modules is formed as an open architecture that allows other developers to easily integrate it into the environment for relationship-oriented provision of other information technology services to tourists [8].

Plan your trip is formally regarded as a complex and time-consuming task that includes a variety of processes, ranging from finding specific tourism information on the country and conditions of reside in it and completing the current route planning in unfamiliar areas. Information technologies provided for the collection of data from various sources, including static and social, and further encourages the user to his places of interest (POI) and routes to pass the maximum number of POI, with maximum regard to his personal requirements and interests.

Conclusion

Trends that trace the markets of travelling information technologies identify personalization and information-technological support for tourist at all stages of his journey, information and cognitive tourism thematization and adaptation to individual wishes of its financial and tourist opportunities as main directions of development.

From the above examples of modern tools in the field of touristic GIS applications, we can conclude that each of them is focused on solving the precise problem one or two problems that tourist faces during the trip. But none of these applications does not provide IT support and user support at all stages of tourist's journey. Another disadvantage of many developments is their "narrow" focus on separate resort area, city or tourist attraction points [6,7]. At present, the information technology market gives no touristic GIS, which could be equally effective to provide information support and accompany tourists in different regions of the world. As a result of the analysis can be highlighted a number of problems that can and must be effectively and comprehensively implemented with GIS tools. These include in particular: the picking of the tourist's route; maintenance and tourist's navigation on the route; adjusting the route to the current location of the user and his chosen mode of transport; the optimal selection of transport (route number for public transport).

One should note the relevance of creating an integrated system using GIS tools to promote tourist at all stages of his journey, which should include:

- details of touristic and other facilities location;
- thematic information about the type and characteristics of various infrastructure facilities (dining, accommodation, entertainment, service departments, etc.);
- selection of infrastructure facilities for the tastes and wishes of the user;
- augmented reality in the form of 3D-models of streets, buildings and other facilities;
- presence of digital maps, additional information as text, photo, video and audio materials.

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