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INFORMATION TECHNOLOGIES, GEOINFORMATION SYSTEMS AND CARTOGRAPHIC SUPPORT IN THE SYSTEM OF PROFESSIONAL TRAINING OF TOURISM EXPERTS AND GEOGRAPHERS

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Abstract

The article is devoted to the problems of using information technologies, Geographic Information Systems and cartographic materials in the tourism sector, both in the educational process and directly in the work of tourist enterprises. Emphasis is placed on specialized software products for solving the management problems of tourist enterprises. The article describes the functional features of maps, GIS products, and Internet resources used for cartographic support of tourist and recreational activities.

Keywords: booking systems; travel route planning; tourist mapping; tourist infrastructure.

Інформаційні технології, геоінформаційні системи та картографічне забезпечення в системі професійної підготовки туризмознавців та географів

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Стаття присвячена проблемам застосування інформаційних технологій, використанню геоінформаційних систем та картографічних матеріалів у туристичній сфері, як в навчальному процесі, так і безпосередньо в роботі туристичних підприємств. Зроблено наголос на спеціалізованих програмних продуктах для вирішення завдань управління туристичних підприємств. Надана характеристика функціональним особливостям карт, ГІС-продуктів та Інтернет-ресурсам, які використовуються для картографічного забезпечення туристично-рекреаційної діяльності.

Ключові слова: системи бронювання; планування маршруту подорожі; туристичне картографування; туристична інфраструктура.

Problem statement. In the modern world, the role of information technologies as means and methods of forming and maintaining information flows in systems of various types is constantly growing.

Tourist activity is very rich in information. The decision to purchase a tourist product is made by the client on the basis of Information; promotion of the tour on the market is carried out primarily by information and advertising methods. Tourism activities are carried out on a global level and cover hotels, travel companies, airlines and other businesses from all over the world. Today, it is difficult to imagine a tourist who, while traveling, does not use electronic maps to search for the tourist sites he needs and plot access routes to them. Business entities in the field of tourism in Ukraine are increasingly using the capabilities of modern Geographical Information Systems in their activities [13].

So, such features of tourist services as a large number of participants and their geographical disunity, a complex system of relations between the subjects of the tourist market, territorial differentiation and complexity of the tourist product, the remoteness of the place of sale of tourist services from the place of their consumption make it necessary to use modern information technologies in the tourism business.

For a travel agency, it is important to search for tour operators, retail and corporate clients, operational communication with tour operators and service providers, purchase of tourist services, the ability to book services, receive confirmation and calculations of the cost of the tour, and obtain operational information. For the successful operation of a travel company, it is necessary to use a constant flow of truthful and timely information to make important management decisions in order to achieve the expected final result - making a profit [11].

Another issue in the work of specialists in the field of tourism is the appropriate information cartographic support. Cartographic works (Maps, Atlases, tourist schemes, booklets, advertising brochures, etc.) are the most visual, capacious and concentrated carriers of spatially organized information, which are widely used by tourists at various stages of travel preparation and implementation, serve as an effective and fairly visual means of attracting potential tourists, as well as investors in the tourist and recreational sphere. There are two main directions in the cartographic support of tourist and recreational activities: maps for tourists and tourists (actually tourist maps), as well as maps for ensuring the management of the tourist business, planning its development and investment (scientific and tourist maps, or maps for the tourist business). Currently, Geographic Information Systems (GIS) are widely developed and used. Creating specialized and basic GIS provides quick access to map and attribute information; allows you to correct, update, analyze and process a large amount of information, conduct situation modeling and assessment of territorial recreational systems and resources associated with them, process spatial requests and create advertising projects [12].

When training specialists in the educational and professional program of applicants for higher education specialty "Tourism" or "Geography", it is important to acquire knowledge and skills in mastering modern information and GIS technologies used in the tourism sector.

Analysis of recent research and publications. V. Baluta, G. Belogurova, P. Burtsev, I. Vatral, O. Veres, A. Galinovsky, O. Gubanova, V. Gulyaev, A. Durovich, I. Zorin, I. Kalashnikov, V. Kvartalnov, T. Kupach, V. Lysenko, N. Matyushina, S. Melnichenko, Yu. Mironov, T. Novgorodtsev, O. Orlik, N. Plotnikova, M. skopen, V. Sych, V. yavorskaya and others. Cartographic support and use of GIS in tourism and geography are analyzed in the works of Shevchuk, B., Nesterchuk, I., Kozhukhivska R., Svetlichny O. A., Pyatkova A.V., Murkalov O. B.,

Formulation of the article's goals. The main purpose of the article is to analyze the use of modern information technologies, cartographic support, including interactive maps and

GIS by tourism businesses, in particular, travel agencies. The purpose of the article is also to review the knowledge and skills in the field of Information Technology and GIS necessary for training specialists in the specialty "Tourism" and "Geography" and develop appropriate recommendations.

Presentation of the main material. A travel agency is a retail firm that acts as an intermediary between tour operator firms and service companies and clients (tourists).

Modern information technologies make it possible to carry out the following areas of activity of a travel agency: information and reference activities; advertising of tourist products; electronic presentation of the enterprise; ordering and selling a tourist product; marketing of a tourist product; monitoring and analysis of tourist activities; the possibility of using electronic international and interregional exhibitions, fairs; use of electronic catalogs of a tourist product; obtaining operational information about tariffs and prices in hotels, restaurants and other tourist services; implementation of mutual settlements; automation of the enterprise's operation.

Among the information technologies used by a travel agency to carry out or can carry out its activities, it should be noted:

- booking and booking systems;

- global distribution systems;

- global computer network internet services;

- telecommunications facilities, computer networks, telephone and other communication channels;

- multimedia tools;

- email marketing systems;

- social networks;

- enterprise automation systems.

As a result of the dynamic development of computer technology and the spread of information technologies in various sectors of the economy, computer booking systems have emerged and developed. Air ticket booking systems began to appear abroad in the late 50s of the twentieth century. in the 90s, the introduction of electronic technologies in the hotel industry and the activities of tourist enterprises began.

The most popular online booking services are:

1) air tickets - booking them is one of the three most popular purchases through the global network. When booking air tickets, the site user enters the start and end point of the

flight and its date, and as a result receives information about all flights that fit the specified description. Based on this information, a booking decision is made;

2) hotels-when booking in any system, the visitor is provided with a description of the hotel and rates for services. The next step is the hotel room booking form;

3) cars-is one of the most popular online booking destinations;

4) tours - are widely used as a tourist service that can be booked online. At the same time, recently clients have the opportunity to independently create a tour according to their taste directly via the Internet: choose the time, hotel, travel method, food option and additional services [5].

Computer-based booking systems can significantly improve the quality of customer service by reducing the time required for ticket processing, improving the quality and efficiency of staff work. The introduction of booking systems allows you to significantly reduce the time spent on customer service, provide online reservations, reduce the cost of services, optimize the formation of the tourist route by price, flight time and other tasks.

Well-known companies in the field of booking are Booking.com Airbnb, tickets Travel Network Expedia and other travel computer companies that can be used to book air tickets, train and bus tickets, hotels, insurance, transfers, car rentals, city breaks, tickets for various events, etc.

Today, about 36% of European tour operators and 40% of travel agencies offer online tour booking [5]. The possibility of online booking provides tourists with time savings on trips to the Office of a travel company, and tourist enterprises – on opening new offices and distribution.

At the same time, there is a tendency to book hotel seats by tourists directly, without the participation of intermediaries. According to the European Commission, 62% of European hotels book rooms ordered not by tour operators, but by customers via the Internet. But despite the fact that the market for independent travel is growing and there are more hotel and ticket booking systems, there has not yet been an explosive leap towards independent travel. Booking systems compete more with each other than with ticket sellers. The outflow of tourists online today is quite small, because in mass destinations (Turkey, Egypt, Montenegro, etc.), buying a ready-made tour through an agency is Cheaper Than online booking, since for large operators there are considerable discounts with guaranteed purchase of hotel rooms and seats on planes.

Initially focused on a single airline, booking systems have turned into software complexes serving groups of airlines, providing a number of additional services for booking

seats in hotels, ordering railway tickets, car rental, etc.now the booking systems contain information not only about the availability of seats, but also general information about flights, types of aircraft involved, a detailed description of fares, as well as information about related industries of the Tourist Business: car rental, hotel accommodation, railway ticket sales, etc. This led to the creation of global distribution systems (GDS) [4].

Such systems allow you to reserve all the main components of the tourist infrastructure, that is, they actually form a common information system and access to databases of tourist service providers around the world. Through global distribution systems, you can contact hundreds of airlines, thousands of hotels and car rental companies, book tickets for rail, sea and ferry services, and reserve tickets for various cultural events.

The largest global distribution systems in the tourist services market are Amadeus, Worldspan, Galileo, Sabre.

The Amadeus system, which was created in 1987 by major European airlines Air France, Iberia, Lufthansa, SAS, is one of the most common reservation systems. In terms of international bookings, the system is the largest in the world. Its services are used by more than 70% of travel agencies in Europe and 36 million people. tourists (daily) [6,8]. Recently, the Amadeus system has been actively entering the Ukrainian market of travel services and is one of the dynamically developing computer booking systems in Ukraine.

Also a major distribution system is the Galileo system, founded in 1987 by British Airways, Swissar, KLM and Covia. This system is distributed in more than a hundred countries of the world and allows you to provide tourists and travel agents with information about tourist products and services, automate the process of booking air tickets, ordering additional services, and direct exchange of Information [9].

No less well-known in the world is the sabre booking system, which was created in 1964 by American Airlines. The hotel reservation subsystem was established in 1976.the system provides access to a wide range of Tourist Services, sells tourist products, distributes and develops technological solutions for the tourism sector [1].

The Worldspan computer booking system was created as a result of the merger of the datas and pars systems of TWA and Delta Airlines and entered into operation in 1993. The system provides reservations mainly for air transport, hotel rooms, tour bureaus, theaters and other cultural enterprises, car rental companies, and provides reference information related to tourism. Worldspan actively promotes internet tourism technologies in the field of e-commerce. The Dates&Destinations program allows you to create an Internet Booking Engine

- a booking system through Worldspan on the website of a travel agency on the Internet. In this case, the client can independently choose a flight or hotel and make their booking [1,6] .

In 2007, Worldspan and Galileo merged with Travelport, one of the world's largest distributors of services in the tourism industry, which covers more than 170 countries and is used by more than 60 thousand travel agencies.

Trust, SRS, Utell, and Start are also popular among foreign booking systems.

If there are a significant number of booking systems, there are problems choosing the systems that a travel company should connect to. As a rule, when choosing a system, the main criterion is the price-quality ratio of the service. In modern conditions, almost all global booking systems offer various connection options that are available both in price and technical capabilities.

Information technologies in the activities of a travel agency are also used for advertising events. Advertising in tourism is a form of indirect communication between a tourist product and a consumer. Advertising should convince potential customers to choose a particular travel agency and its product, and keep regular customers interested. Of particular importance in the tourism business is online advertising, because it is available without restrictions at any time of the day to a wide range of consumers [2].

Advertising on the internet by a travel agency can be represented by various means: banner (on commercial sites); contextual (in search engines); registration in search catalogs; media advertising; advertising mailing by e-mail. An important and almost necessary condition for the effective operation of a travel agency today is the creation of your own website.

By creating your own website, the company must solve the issue of hosting (hosting the site on one of the internet servers). Large businesses can have their own server. Firms for which the cost of maintaining their own server is too high can host their site, for example, on the provider's website. After that, the site is "promoted", for which it must be registered in various search engines and ratings, and use various internet advertising technologies [2].

Multimedia technologies allow you to process different types of data in a single environment - photos, videos, text, and audio. The most common areas of use of multimedia tourism are the creation of electronic catalogs, virtual excursions, audio guides, and so on. Using the electronic directory-catalog, you can choose a travel agency and a travel product, and place an order. The high efficiency of such catalogs is due to the extremely high amount of information on web pages presented by various multimedia tools.

An important area of activity of a travel agency is also advertising and maintaining direct communication with regular and potential customers through social networks. Creating appropriate communities and pages in social networks allows you to maintain constant relationships with customers and partners, form a virtual audience, advertise travel products, and solve other marketing tasks.

Today, automated enterprise management systems are increasingly used in the activities of tourist enterprises as information management systems that provide the necessary information for making a managerial decision.

There are several computer systems on the market of software products that allow you to automate the internal activities of a travel company. As a rule, these systems provide reference databases for clients, partners, hotels, transport, embassies, as well as tour management and payment accounting, receiving orders and working with clients, generating source documents, etc.almost all software packages provide accounting reporting and partially Export-Import data into specialized accounting programs [7].

The most common in the activities of domestic tourist enterprises are specialized software products: "Turbo Tour", "Parus-Travel Agency", etc. these products are primarily aimed at solving management problems and have such advantages as reducing costs by optimizing the business processes of tourist enterprises; guaranteed fulfillment of orders in the required volume and within the specified time frame; ensuring the quality of the tourist product through the quality of production and management technologies [3].

Automation allows you to significantly speed up the implementation of many tasks facing a travel agency, save money, and increase the efficiency of both each employee individually and the entire enterprise as a whole. This directly affects the competitiveness of a travel company in the market.

Information technologies play an important role in performing marketing functions by tourism industry enterprises, as they simplify the solution of complex tasks in a dynamic business environment [11]. The main directions of using marketing information in tourism are: marketing research; marketing strategy; market segmentation; development of nomenclature and production volumes of tourist services; pricing policy; demand formation and sales management; marketing communications. Marketing communications are aimed at informing and persuading consumers, reminding them about travel products, promoting sales and creating a positive image of the enterprise in the eyes of the public. They include: advertising, public relations (PR), sales promotion, direct marketing, participation in exhibition and fair events, corporate identity (branding) [5].

There are two main directions in the cartographic support of tourist and recreational activities: maps for tourists and tourists (actually tourist maps), as well as maps for ensuring the management of the tourist business, planning its development and investment (scientific and tourist maps, or maps for the tourist business).

Maps for tourists. The task of the map for tourists is to provide reliable and comprehensive initial information about the area and opportunities to get acquainted with it, about objects of tourist interest (cultural, historical, natural, etc.), about the placement of tourist service objects (hotels, campsites, tourist bases, restaurants and cafes, car service stations, etc.). Tourist maps should provide a solution to the entire range of tasks facing the tourist during the planning and implementation of the trip: choosing the optimal route; choosing the means of Transportation; calculation of the necessary and sufficient time for comfortable travel (taking into account the chosen means of transportation); providing the possibility of rest (both for overnight stays and during daytime movements); catering; ensuring safety and communication capabilities during the route, etc. the main requirements for tourist maps: reliability, accuracy and thematic completeness (according to the type of cartographic work); effective cartographic design and readability; ease of use; necessary and sufficient amount of additional reference material [13] .

For example, a characteristic feature of ecotourist maps proper is the predominance of large-scale maps (1: 100,000 or more) containing detailed information for a specific region. These can be maps of complex tourist content that reflect the entire set of necessary information.

The second group of large-scale tourist maps is formed by specialized maps, for example, maps for fishermen (with detailed information about the places of catching different types of fish, the depth of reservoirs, the speed of rivers, etc.), mushroom pickers (with a detailed description of the species composition of the forest, popular mushroom picking sites, etc.), for mountain tourism (indicating recommended routes of different difficulty categories, caves, dangerous slopes, places of possible overnight stays, etc.). For ecotourism focused on wildlife observation, the map shows bird watching points, canoe rental points, fishing spots, eco-trails, forests and parks, protected areas with brief information, etc. The map for ecotourism for the purpose of visiting natural heritage sites using vehicles (bicycles, boats, etc.) displays berths, lighthouses, cycling routes, wetland borders, etc.

Cartographic support for planning tourist activities. The second direction of tourist mapping-maps for ensuring the development of tourism business, attracting investment in tourism and planning tourism business - is at the initial stage of development, although the

need for such cartographic and information publications is obvious. Each country should have a series of maps (or atlas) that reflect the natural resource and tourist and recreational potential.

The most important purpose of such cartographic works is to show a real picture of all aspects of the socio - economic sphere that significantly affect the possibility of carrying out ecotourist activities. In tourist cartography, there are three main types of maps - analytical, complex, and synthetic.

Analytical maps provide the most detailed description of a set of homogeneous tourist sites by a limited number of indicators (for example, the actual share of protected areas and the share of territories potentially suitable for the development of an eco-network.

Complex maps show the entire set of objects that are significant from the point of view of a tourist (objects of tourist interest and tourist infrastructure). Complex maps reflect the results of aggregation and synthesis of a large amount of information and provide an integral description of the territory or phenomena. The most typical example of complex maps is recreational and tourist zoning maps

World leaders in the market of GIS products (ESRI with ArcInfo product and Pitney Bowes Inc. with the MapInfo product), a number of specialized applications are offered that allow you to explore recreational activities, collect information about the location of Parks and nature reserves, evaluate the transport system, increase investment attractiveness, and so on. Currently, GIS technologies are used for cartographic support of tourist and recreational activities, for creating three-dimensional images of recreational areas, filling sites with reference information, in the development of excursion trails and the formation of regional tourist cadastres [10, 12].

The most well-known Internet resources that can be used when planning a tour include the free-to-download program and the Google Earth Geographic Information System (www.google.com/earth the greatest value of this resource is that it allows you to view the Earth's surface in detail. The resolution of photos is based on" areas of interest", but mostly it is at least 15 meters. At the same time, it is possible to rotate the image and tilt it. You can determine the coordinates of any object and its altitude position. In addition, it is possible to measure the length of a route and build its vertical profile. The latter allows you to determine the height difference and slope of the terrain, which is valuable for assessing the complexity of overcoming the route. The resource allows you to upload photos taken on the ground (Panoramio service). In addition, you can quickly find the location of a city, village, or even a hotel. The resource also contains an option that shows the location of nature parks and

recreation areas. Obviously, all this makes it possible to better imagine the situation on the ground.

The SAS online resource is also very useful when planning a future trip.The planet www.sasgis.org) - free navigation software that combines the ability to download, view and analyze maps and satellite photos of the Earth's surface from various online mapping services (Google Maps, Yandex.Maps, Bing Maps, Yahoo! Maps, NASA, Navitel, eAtlas, WikiMapia, Gurtam and others). In the SAS resource.Planet is a Panoramio service, you can determine the height of the terrain, you can overlay an additional layer on the selected image (for example, a travel route) and edit it. You can use this feature to map the route you are creating. Thus, with the help of modern information technologies, you can form a fairly good idea of what the tourist route will be like.

The level of Information technology development in tourism activities in Ukraine still lags significantly behind the level of developed countries. At the same time, it is quite clear that in modern conditions, the use of information technologies in the field of tourist services is a necessary condition for successful promotion of a tourist product to the national and international markets. Therefore, it is extremely necessary to provide high-quality professional training of highly qualified specialists in the field of Tourism, who are very well versed in Information Technologies, GIS systems and their use in tourism activities.

In the course of training, applicants for higher education in the specialty 242 "Tourism" should acquire the following competencies in mastering information technologies: the ability to apply knowledge in practical situations; the ability to use information technologies and office equipment in the work of tourist enterprises; the ability to use Internet resources to solve experimental and practical problems in the field of professional activity; the ability to develop, promote, implement and organize the consumption of a tourist product; ability to monitor, interpret, analyze and systematize tourist information, ability to present tourist information material; ability to cooperate with business partners and clients, ability to provide effective communication with them; ability to work with tourism business documentation.

In the course of teaching subjects that introduce students to Information Systems and technologies in general and their use in tourism activities, it is necessary to solve the problem of mastering office software (Microsoft Office package, including tools for creating presentations, advertising products), tools for creating Web pages, as well as universal project management packages (Microsoft Project, Timeline), statistical data analysis (Microsoft Excel, Statistica), technology for creating and managing databases, multimedia tools;

introduction to global computer booking and reservation systems (Amadeus, Galileo, etc.), automated management systems for tourist enterprises .

As we have already mentioned, geographic information technologies and systems are now firmly embedded in our lives. Using applications such as Google Maps, Google Earth, and JPS Navigators has already become commonplace. These services are also very useful and often necessary for organized and unorganized recreational and tourist activities. With the help of GIS technologies, it is possible to navigate the terrain, create databases of tourist sites, digital maps, develop tourist routes, virtual excursions, and so on.

It is very useful for future tourism specialists to acquire competencies and skills in the field of Geoinformation technologies, in particular, to provide basic ideas about Geoinformation systems for their use in scientific and experimental research of tourist and recreational facilities, the ability to compile, edit and constantly correct cartographic materials necessary for professional activities, knowledge of modern methods of maintaining geospatial data bases and creating new electronic maps using GIS. At the same time, cartographic materials for tourism needs, both spatial and figurative-sign models of tourist and recreational resources of the territory and tourist destinations, play a significant role.

Therefore, an important component of educational and professional training is to familiarize students with modern popular GIS packages and the basics of working with them (MapInfo Professional, ArcGIS, QGIS, etc.). Using Google Maps, Google Earth, and GIS technologies, it is possible to perform laboratory work on creating electronic maps, databases of tourist sites, and developing and visualizing tourist routes.

Conclusions. The modern tourism industry is one of the priority areas of the world economy. The priority areas of the tourism business are to activate the promotion of the tourist product in the domestic and international markets of tourist services, improve the quality and efficiency of the information infrastructure. In modern conditions, no successful travel company can fully and effectively develop without modern information technologies. The introduction of Information Systems and technologies opens up new opportunities for effectively solving the main tasks of the tourism business. Thanks to their use, travel agencies have the opportunity to access reliable and up-to-date information on tours, offer customers several tour options to choose from as quickly as possible, invent the best price offer, quickly book a tour and draw up the necessary documents, establish convenient communication with tour operators with minimal time and money. In the system of professional training of applicants for higher education in the specialties "Tourism" and "Geography", information technology disciplines are very important. Their study provides for the training of a qualified

user with information technologies of both general and special profiles, the development of cognitive and professional activity of future specialists.

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