3. Выводы

Описание и публикация географических данных в виде XML-документа накладывает еще более жесткие требования на выходной формат. Необходимо обеспечить эффективное представление векторных географических данных и контроль их топологии, возможность редактирования в XML-файле отдельных объектов и узлов без переписывания всего содержимого, описание больших массивов растровых изображений. Таким образом, приходим к необходимости строгой типизации и стандартизации представления метаинформации для пространственных данных при помощи языка разметки, а также расширения стандартной функциональности XML.

Большую работу в этом направлении ведет международная некоммерческая организация OGS (Open Geospatial Consortium), объединяющая на сегодняшний день свыше двухсот организаций, занимающихся исследованиями и разработками в области информа-

ционных технологий и ГИС. Организацией OGS был разработан ряд стандартов представления пространственной информации и разработан язык GML (Geography Markup Language), в основе которого лежит расширенный и дополненный формат XML-документа.

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METHODS FOR BUILDING GEO-SOCIAL SYSTEMS IN THE INTERNET. CARTOGRAPHIC AND GEO-LOCATION SERVICES

Розглянуто особливості популярних гео-сервісів, проводиться аналітичний огляд такого роду сервісів. Описано веб-сервіс, який був створений для демонстрації результатів дослідження

Ключові слова: гео-сервіс, дослідження, розробка

Рассмотрены особенности популярных гео-сервисов, проводится аналитический обзор такого рода сервисов. Описан веб-сервис, который был создан для демонстрации результатов исследования

Ключевые слова: гео-сервис, исследование, разработка

Features of geo-services are discussed; the analytical overview such kind of services is listed. Web-service for demonstration of analysis results is reviewed

Key words: geo-service, research, development

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1. Introduction

For the last years geo-information and cartographical services began to gain more popularity in the Internet. Such services of the given category as Google Maps, Bing Maps, Yahoo! Maps and Yandex Maps are widely spread all over the world. Also there is a huge amount of less known geo-services in the World Wide Web as Wi2Geo, Mapia, Meta,

Bigmir, and Rambler that became quite popular on the former CIS area.

The present article shows the analytical overview of geo-services that are given to users, the look into its usability and cases of use, defects and methods of its improvement. On the basis of the overview it is suggested to build a new geo-service that would include all the needs of the modern geo-information IT market, so that would make it attractive to a big amount of users and competitive among its analogues in the nearest future.

2. The overview of the existing geo-information systems

A geographic information system (GIS), or geographical information system, is any system that captures, stores, analyzes, manages, and presents data that are linked to location. In the simplest terms, GIS is the merging of cartography and database technology.

All GIS have the following structure:
1. Data (spatial data):
a. positional (geographical): object location.
b. nonpositional (attributive): descriptive information.
2. Hardware.
3. Software.
4. Technologies.

GIS include DBMS, bitmapped and vectorial graphics editor, analytical tools capabilities and are used in cartography, remote sensing land surveying, photogrammetry, geography, urban planning, emergensy management, navigation, localized search engines etc. Also of late years GIS are widely used in the social networks in the Internet.

The overview of the most popular GIS is given below.
Google Maps

Google Maps (for a time named Google Local) is a web mapping service application and technology provided by Google, free (for non-commercial use), that powers many map-based services, including the Google Maps website, Google Ride Finder, Google Transit, and maps embedded on third-party websites via the Google Maps API. It offers street maps, a route planner for traveling by foot, car, or public transport and an urban business locator for nummerous countries around the world. According to one of its creators (Lars Rasmussen), Google Maps is "a way of organizing the world's information geographically".

Google's use of Google Maps:
a. Google Ride Finder

Google launched an experimental Google Maps-based tool called Ride Finder, tapping into in-car GPS units for a selection of participating taxi and limousine services. The tool displays the current location of all supported vehicles of the participating services on a Google Maps street map.

b. Google Street View

Google Street View is a technology featured inGoogle Maps and Google Earth that provides panoramic views from various positions along many streets in the world.

c. Google Maps API

Google created the Google Maps API to allow developers to integrate Google Maps into their websites with their own data points. It is a free service, and currently does not contain ads, but Google states in their terms of use that they reserve the right to display ads in the future.

By using the Google Maps API, it is possible to embed the full Google Maps site into an external website. Develo-

pers are required to request an API key, which is bound to the website and directory entered when creating the key. Creating a customized map interface requires adding the Google JavaScript code to a page, and then using Javascript functions to add points to the map.

For Ukrainian developers the Google Maps kind from other similar services is that Google Maps API permits to search settlements on the area of Ukraine by its Ukrainian name.

d. Machups

Google maps links to the geo-tags placed in Wikipedia articles. It also links to photos with GPS tags from Panoramio.

e. Google Transit

The service calculates route, transit time and cost, and can compare the trip to one using a car.

f. Google My Maps

In April 2007, My Maps was a new feature added to Google's local search maps. My Maps lets users and businesses create their own map by positioning markers, polylines and polygons onto a map. The interface is a straightforward overlay on the map. A set of eighty-four pre-designed markers is available, ranging from bars and restaurants to webcam and earthquake symbols. Polyline and Polygon color, width and opacity are selectable. Maps modified using My Maps can be saved for later viewing and made public or marked as private.

Each element added to a My Map has an editable tag. This tag can contain text, rich text or HTML. Embeddable video and other content can be included within the HTML tag. Created maps can be embedded into a blog or web site.

g. Google Latitude

Google Latitude is a feature from Google that lets users share their physical locations with other people. This service is based on Google Maps, specifically on mobile devices.

h. Google Flu Shot Finder

Google Flu Shot Finder allows users in the United States to identify locations where both the pandemic H1N1/09 virus and seasonal flu vaccines are available near a given address or ZIP code.

Bing Maps

Bing Maps (previously Live Search Maps, Windows Live Maps and Windows Live Local) is a web mapping service provided as a part of Microsoft's Bing suite of search engines and powered by the Bing Maps for Enterprise framework.

Bing Maps capabilities:
a. Street Maps

Users can browse and search topographically-shaded street maps for many cities worldwide. Maps include certain points of interest built-in, such as metro stations, stadiums, hospitals, and other facilities. It is also possible to browse public user-created points of interest. Search can cover public collections, businesses or types of business, locations, or people.

b. Satellite images

Bing Maps also includes several terabytes of satellite and aerial imagery. In many areas, maximum resolution is approximately 4.5 pixels per meter. Elsewhere, especially in the most remote areas of the world, top resolution is a few orders of magnitude less. Users may toggle labels on or off, choosing whether to see the ground as it would appear from an airplane versus closer to how it would appear on a map.

c. Bird's eye view

In over 100 cities in the United States, Canada, and Japan and in over 80 European locations, a bird's-eyeview offers aerial photos from four angles. These Pictometry images are much more detailed than the aerial views from directly above buildings. Signs, advertisements, pedestrians, and other obje-

cts are clearly visible in many bird's eye views. Bing uses mutation string s-box algorithms to remove people from images.

d. 3D maps

The 3D Maps feature lets user see buildings in 3D, with the added ability to rotate and tilt the angle in addition to panning and zooming.

e. ClearFlow

Microsoft announced in March 2008 that it will be releasing its latest software technology called "ClearFlow". It is a Web-based service for traffic-based driving directions available on Bing.com. The tool took five years for Microsoft's Artificial Intelligence team to develop. ClearFlow provides real-time traffic data to help drivers avoid traffic congestion. ClearFlow gives information for alternative routes and supplies traffic conditions on city streets adjacent to highways. Clearflow anticipates traffic patterns, while taking into account sporting/arena events, time of day and weather conditions, and then reflects the back ups and their consequential spill over onto city streets. Often, ClearFlow found it may be faster to stay on the highway instead of seeking alternative side street routes, which involve traffic lights and congestion as well.

f. Imagery Updates

Bing maps frequently update their aerial imagery, on roughly a monthly basis. Each imagery release typically contains more than 10TB of imagery.

g. API

Bing maps has quite powerful API that is similar to Google Maps API, but also it provides an ability to control map on the page with the server side events.

Yandex Maps

Yandex Maps is a search-informational service that provides maps of the big Ukrainian and Russian cities, actual information about plugs, underground schemas and other capabilities. The weekly attendance of the service is approximately 3 millions of people. It offers the similar services as Google Maps and Bing maps but for Ukraine and Russia.

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3. The analytical overview of GIS

So what helps geo-services to gain more and more popularity both in Ukraine and all around the world? The answer lies in two basic concepts that underlie each GIS: geo-targeting and geo-location.

Geo-targeting allows users to receive different kind of information from his region, that is often calculated by his IP address, and geo-location helps to find out where are the targets that user is interested in. The tendency to promote these factors arose with the social networks development, because every person in it is marked not only by his name and career, but also by his geographical coordinates: schools, University, different places etc. People who want to view "offline" online came to social networks. That means that normal, but not conceptual, public wants to know simple things: where their friends and relatives are. Further they might want to know other answers to other question "where". These people, whose number increases every year, will become the active geo-service users.

Geo-service can be defined as a service that operates with geographical maps displaying objects or service appendages on area. With the development of geo-services geotargeting finds its continuation and turns into a holistic product that not only determines where person comes from, and through which the user displays regional content, but also expands the field of view on user's surrounding geographical area, beco-

ming a new research tool of surrounding areas - a visual pipe with an opportunity to interact with the identified objects.

The idea of developing map services isn't new. However, in most cases developed services played a passive role and did not give much useful information. What is the usability from information that someone is in Prague and someone else in Austria?

Geo-services can become much more useful for people and more popular, embossing secondary conventional social network where users simply fill the content. To do this they need to provide awareness and lay the practical application, for example:

a. Geo-service for motorists is possible and profitable prospect. Everything confronted to the man behind the rudder, can be placed on a map. From this conclusion: the information of abstract addresses turns into specific "visual" objects. It's quite convenient and practical. Existing services such as Yandex corks - it is certainly very interesting. But, information of bypass routes, feedback on service and free parking places can be much more useful.

b. Geo-service that is working with search engines. Write your location and look for the next necessary objects: shops, pharmacies, friends on social networks, hosting sites, employees, various public events, etc.

c. Guide Geo-Services — a map catalog of companies. Building numbers, street names turn into the map objects, routes, landmarks and the route becomes clearer. You can also search for similar offers.

d. Geo-service for social networks. Almost all the events that take place in social networks can be put on the map to illustrate and even to build on it a social network based navigation system.

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4. The goal

The last point of the geo-service application deserves much attention. There are some similar web solutions in the Internet, such as Google Latitude, that provides abilities to track friends' location, but all these solutions are mostly void of useful components. With the analysis of ideas and different cases of implementation it is suggested to build a new geo-social solution named You@Point based on Bing Maps. Bing Maps service was chosen because of easy integration to Microsoft technologies. You@Point was built with ASP.NET MVC i WCF.

The list of the capabilities of You@Point, that users might find very useful, is given below:

1. You@Point has mobile and web interface;
2. The ability to watch over your friends' location;
3. Instant connection with them through call, sms, chat or imagery;
4. Storing the history of your locations to track and displaying it on the map;
5. Calculation the convenient route to visit several places in the shortest time;
6. Viewing your friends' tracks;
7. Geo-targeting (the ability to get to know about the nearest object you are interested in);
8. Getting alarm message when you are next to your friend;
9. Publication of your location and walking track to your blog or web site;
10. Ability to build and publish track with your upcoming plans;

11. Ability to organize small, geographically localized chats with anyone who wishes, which are in the specified area, that will make it possible to ask for anything you are interested in;
   • Easy-to-use API.

5. Conclusion

The work has resulted in investigating existing geo-services. Mechanism of interaction with cartographical systems by the example of Bing Maps has been studied. In addition, technologies of fixing a position in cellular communication networks have been researched. Prototype of the geo-social system comprising three parts - web application, web services and mobile application, has been developed.

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Пропонується система рішення багатокритеріальних задач лінійного програмування, яка заснована на технології прийняття рішень. Розроблені компоненти системи рішення задач, які реалізують комплекс методів (алгоритмів), що дозволяють вирішувати широкий спектр задач у керуванні бізнесами-процесами

Ключові слова: бізнес-процес, інтелектуальна система, сімплек-метод

Предлагается система решения многокритериальных задач линейного программирования, которая основана на технологии принятия решений. Разработаны компоненты системы решения задач, которые реализуют комплекс методов (алгоритмов), позволяющие решать широкий спектр задач в управлении бизнес-процессами

Ключевые слова: бизнес-процесс, интеллектуальная система, симплекс-метод

The system of doing multicriterion sums of linear programming that is based on the making-decision technique is proposed. The components of a making-decision system which fulfils the complex of algorithms that allow to do a wide range of sums in business-processes management, have been designed

Key words: business process, intellectual system, simplex-method

ИНФОРМАЦИОННАЯ ТЕХНОЛОГИЯ ПРИНЯТИЯ РЕШЕНИЙ В УПРАВЛЕНИИ БИЗНЕС-ПРОЦЕССАМИ

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1.Введение

Специфической особенностью задач принятия решения при управлении сложными предметными областями, к которым относятся бизнес-процессы (БП), является многокритериальность. Задачи данной предметной области в основном носят линейный характер, что позволяет использовать модели линейного программирования (ЛП).

Задачи управления БП, как правило, относятся к слабоструктурированным и характеризуются трудностью формализации управляемых процессов.