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ESTABLISHING A PROCEDURE TO GENERATE CUSTOMIZED LAND USE MAPS UTILIZING REMOTE SENSING DATA

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A B S T R A C T

For the last several decades, humanity has been experiencing an information crisis. It is getting stronger year by year and entering many areas of human activity. Today, cartographers use information from many sources to create topographical and geographic maps and atlases, to decipher aerial and space images, to process the results of field measurements, and to present information in web form in computer systems.

K E Y W O R D S

GIS, web-map, cartography, cadastre, map, available statistics, visualization, electronic map, land fund.

Introduction

In order to properly use the land fund of our republic, properly organize agriculture, and increase the economic efficiency of the land, determining the current state of the land and cadastre is one of the important tasks in terms of natural and economic aspects. For this, all the lands used in agriculture should be represented on the maps, it is appropriate to describe the measures to eliminate the saline and eroded lands on the maps. Land mapping, use of land fund in agriculture. On the maps, it is possible to describe land according to 2 groups, i.e. land used for agriculture and land not used. The word cadastre is derived from the Latin word “cadaster”, which means providing information about objects for taxation and cadastre. Such information includes the legal owner of the land, the description of the location of the land plot, its shape, land area, quality of the land, productivity and the price of the land. Naturally, such information is described and calculated on the basis of tables [1-5].

In general, land cadastral cards are intended for various purposes: determining the level of efficiency of land use, determining the amount of payment (tax) for land and its normative value, permissible negligence in seizing land for state and community needs. and compensating for damages, setting the starting price for selling land plots through auction, taking into account land cadastral data on various agricultural crops, the usefulness of the crop, the natural and economic conditions of the farm as an important resource in the scientific-based solution of problems related to the placement of plants and specialization of agricultural production, as well as the rational use of land and some measures for their protectionis used.

Therefore, it is an urgent and important issue to provide high-quality representation of such information and to facilitate the reading of information, as well as to prepare web maps and apply them

to the field. The reason is that cadastral cards are designed for different purposes: determining the level of efficiency of land use, determining the amount of fee (tax) paid for land and its normative value, negligence in taking land for state and community needs, etc. compensation for damages, setting the initial price in the sale of land plots through auction, land cadastral information on various agricultural crops, the usefulness of the crop, plant placement taking into account the natural and economic conditions of the farm and it is used as an important resource for solving problems related to the specialization of agricultural production on a scientific basis, as well as for rational use of land and some measures for their protection. Imagine the information represented on the cards [6-10].

Study of the research object

The studied area (direction) is taken as an example of Fergana region, statistics of organizations engaged in clustering activities: types of goods or products produced by export, import, and the location of the area and the presence of other clusters in nearby areas is studied and applied to fields by creating user-friendly web maps. A question naturally arises, what processes should be considered and why exactly we should use web maps!? In fact, it is important to know about the development of maps and the application and revolution of web maps in industries.

what is the benefit to use web mapping in some fields? There are numerous benefits to using web mapping in various fields. For example:

1. Emergency response: Web mapping can be used to quickly identify the location of incidents and improve the response times of emergency services.
2. Transportation: Web mapping can be used to track vehicles and monitor traffic flow, making it easier to manage logistics and optimize routes.
3. Urban planning: Web mapping can be used to analyze patterns and trends in urban environments, enabling planners to make informed decisions about land use and development.
4. Natural resource management: Web mapping can be used to monitor and manage natural resources such as forests, waterways, and wildlife habitats, helping to promote sustainable management practices.
5. Marketing and advertising: Web mapping can be used to analyze consumer behavior and market trends, allowing businesses to target their advertising and marketing efforts more effectively.

First of all a revolution in web mapping. Two major changes have occurred in Internet mapping over the past two years. First, the introduction of new, more dynamic and interactive interfaces. The second is the ability of map users to enter data. Both have the potential to revolutionize the meaning of the map. To give some context to this revolution, it's important to note that web map designs have gone through two.

What is web mapping? Before introducing web mapping, we can define some definitions that are currently available: “Web mapping is information and data updating, security and authentication user, (3) user a collection of forms filled out by (surveys, opinion polls, etc.) and access to databases; “Web mapping is the process of designing, implementing, creating and delivering maps on the Internet”; “Web mapping is a technique of using maps obtained by an information system for spatial and geographic data” and “Web mapping is the process of using maps provided by geographic information systems (GIS) [11-14]. In addition to the recognized scientific and technical definitions, we also decided to consider what is provided by Wikipedia for two reasons: it can be the definition of user

contribution improved and enriched by everyone, and it is the main one for many one of the sources of information, sometimes including scientists. We will see that in reality these definitions are reductive and to have a complete definition, the term web mapping must be put into context with the specific period it refers to. Web mapping involves three main elements: geodata/geoinformation and their visualization (maps), geospatial software, and the World Wide Web or Internet (hereinafter the Web). Due to the focus on maps or technology and geodata processing Map production, people consider the concept of web mapping to be different from Internet GIS (even if they admit that the boundary is blurred) or, on the other hand, they use the two terms synonymously .

Methods

For clarity, we have chosen to define Web GIS as a full-fledged GIS. its components (data, functionality and interface). The concept of web mapping is more general and aims to provide and support mapping functions of varying degrees of complexity for applications and users. There are more terms that are sometimes confused with web mapping and web GIS. These include Internet GIS, GeoWeb (or Geospatial Web), and Distributed GIS. Internet GIS is a term often used synonymously with Web GIS.

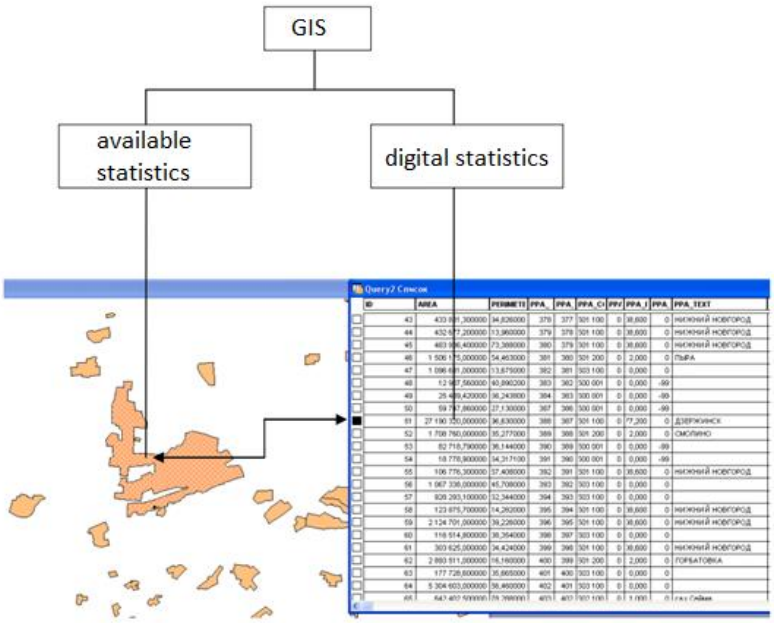

Figure 1. *GIS can include both types information.*

There are many software options available to create web maps, and the choice often depends on your specific needs and expertise. Some popular options include:

1. ArcGIS Online - a cloud-based platform with a range of tools for creating and sharing maps and apps.

2. Google Maps API - allows developers to embed Google Maps into their website or application and customize its appearance and functionality.

3. LeafletJS - an open-source JavaScript library for creating interactive maps that work on desktop and mobile devices.

4. Mapbox - a platform for creating custom maps and location-based applications, with options for design customization and data visualization.
5. CARTO - a cloud-based platform for creating location-based analyses and visualizations, with options for data integration and real-time data updating.
Ultimately, the best software for you will depend on your specific needs and skill level, as well as the features and functionality you require from your web map.
This is an application that can use more services than the Internet-geo-spatial Internet. It is therefore a more widely used technology, but not as widely used as the term Web GIS. In fact, the Internet is the most widely used Internet technology and Web GIS is the most common form of online GIS. Therefore, we use the term Web GIS to represent all online GIS. Two different definitions can be found for GeoWeb: the first is a collection of non-geospatial data (photos, videos, news, etc.); as the latter is synonymous with Distributed GIS, that is, a widespread geospatial environment that allows data sharing, interoperable components. While people used the same name, web mapping, concepts and practices, co-web mapping has changed dramatically over time following the evolution of interaction mapping data/data, web, web , available tools and citizen/user attitudes [15-17]. If we want to summarize, we can say that web mapping consists of a website mapping ability. Over time, the ability and interest of people to consume has grown (and recently) in contributing to those websites has grown accordingly. If we add the names of the periods as suggested in this article, we can define better. characteristics of the specific type of web mapping we are referring to. For example, in the beginning web mapping was equivalent to publishing static maps on the Internet, hence “static web” mapping. By “intelligent web mapping” we mean the final frontier of web mapping, where context plays a key role in the interaction between mapping/geographic data and users. Based on the nomenclature proposed for the periods by other authors, we can better resolve many of the ambiguities associated with the general term “web mapping”.

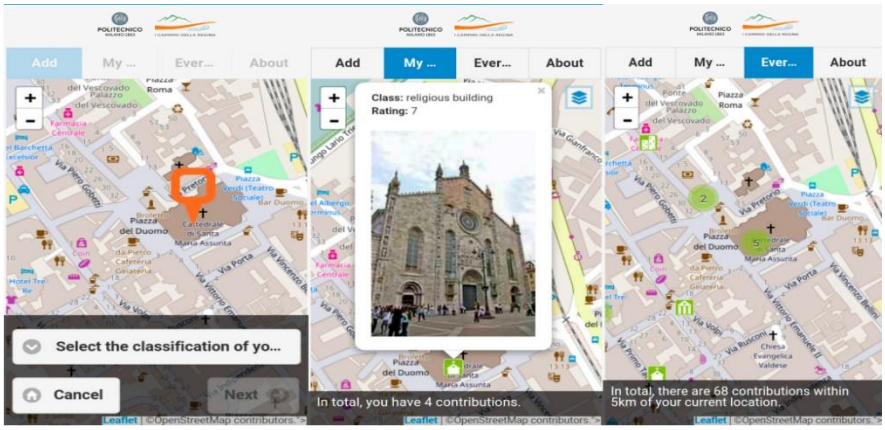

Figure 2. *The Via Regina app: an example of participatory sensing. Users, after sensing, can view their own data (My Map) as well as that contributed by others (Everyone).*

Results

In the previous section, we defined web mapping by analyzing some existing definitions. In this section, we will go further to explore the characteristics of web mapping that can help: (1) distinguish web mapping from others, such as Web GIS, Internet GIS, etc.; (2) web design support mapping

applications; and (3) inform the selection of web mapping technologies for developments. Web mapping uses the world's largest multimedia platform, the web, to deliver maps and deals primarily with technological issues, but also requires further research into cartographic theories, among other issues. This means that web mapping not only follows different Internet protocols, but also uses web-specific protocols. It also means that new technologies and cartographic principles are needed to effectively design maps for webmap delivery. Unlike desktop mapping technologies, web mapping is largely not a ready-made solution, although many of its underlying technologies are already well developed. It often requires a bit of programming and requires breadth in terms of skills, knowledge and organizational structures to apply application programs [13]. Web maps and related content presented in the web environment, i.e. web browsers, require a suitable interface for queries and reports and often optional functionality. Maps, audience, interface (such as size, spacing, and color) and responsive features are important in web design. factors to consider. For example, the interactive nature of web mapping requires some operations, if not all, relevance, logical flow, and user attention. Map layouts can be limited by the limited screen space of web browsers and mobile devices. In addition, new cartographic design rules are needed for web mapping applications [14], although many have already been studied in depth. With the recent development of content-based and user-generated web mapping.

a) characteristics of web mapping developments. Present six ideas (ie, characteristics) of web mapping and neo-geography: (1) individual production and user-generated content; (2) the use of mob power; (3) public information produced; (4) the principle of participation; (5) network effects; and (6) openness. A number of attempts have been made to capture web mapping developments. These are mainly important technological initiatives related to the improvement of technology on a large scale or in special communication. However, the above general features of web mapping will be much clearer.

b) professional cartography in the Internet age. The main obstacle to the maturity of these services is the relative shortage of academic and professional cartographers in the field. Software engineers are responsible for constantly improving user interfaces with little knowledge of quality map design. My personal experience is that the maps themselves are often treated as trivial matters by engineers. Although the most popular mapping sites are designed with the limitations of adequate computer screens in mind, they are far from printed maps developed by professional cartographers. Whether we like it or not, the map industry will increasingly be dominated by the web, and paper maps distributed through traditional channels will become increasingly marginal. Are existing cartographers at risk of being squeezed out on both sides, technical but not design-able programmer-mappers and consumer-map makers with no skills? We do not need to be in the dark of the map design. Cartographic expertise is needed more as maps reach a wider audience. However, we must avoid becoming marginalized. A cartographic experience in the development of services in dire need. The challenge for most of us is developing quality internet services with the increasing (and ever-changing) technology required. What does the successful cartographer of the future need to know? Javascript, KML and PHP more than Illustrator and ArcGIS?

There seems to be a lot of research on web mapping. It is more active in Europe than in the USA, but several American researchers are contributing to the improvement of web cartography in several regions.

Figure 3. *Virtual globe based on NASA World Wind for sharing and managing user generated content.*

Conclusion

As a language model, we understand that cartography is the science and art of creating maps. The main thing in cartography when it comes to web mapping would be the use of technology to create and publish interactive maps online. This involves the use of geographic information systems (GIS), computer graphics, data visualization, and data analysis tools to present geographical data in a way that is easy to navigate, interpret, and understand. Your dissertation related to web mapping could involve exploring the different techniques and tools used in cartography to develop user-friendly and effective web maps. However, web mapping is an important tool for visualizing and communicating geographic information to a wide range of audiences. It allows for the efficient sharing of spatial data and provides users with the ability to interact and analyze the data in a meaningful way.

References

1. Abduraufovich K. O., Diallo Y. K. B. Drawdown of Groundwater Level in Open Pit Mine //AIJR Abstracts. – 2022. – С. 60-61.
2. Marupov A. et al. Procedure and method of marking administrative-territorial boundaries on the basis of digital technologies //E3S Web of Conferences. – EDP Sciences, 2023. – Т. 452. – С. 03007.
3. Akhmedov B. Using the fundamentals of the theory of measurement errors in performing geodesic measurement and calculation works //E3S Web of Conferences. – EDP Sciences, 2023. – Т. 452. – С. 03012.

4. Xakimova K. et al. Theoretical and methodological issues of creating the “ECO FERGANA” mobile application of tourist objects and resources of Fergana region //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 05025.
5. Ganiyev Y. et al. Examining the managerial structure and operational aspects of geodesy, cartography, and cadastre production //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 03013.
6. Eshnazarov D. et al. Describing the administrative border of Koshtepa district on an electronic digital map and creating a web map //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 03009.
7. Yusufovich G. Y. et al. USING A DATA BANK THAT AUTOMATES DIGITAL MAPS IN THE ArcGIS APPLICATION //American Journal of Technology and Applied Sciences. – 2023. – T. 18. – C. 67-70.
8. Turdikulov K. Calculation of the stability of ground dam under seismic loads //E3S Web of Conferences. – EDP Sciences, 2023. – T. 452. – C. 02021.
9. Abdurakhmanov A. A., Mirzaakhmedov S. S. H. DEVELOPMENT OF MECHANISM FOR CARTOGRAPHIC SUPPORT OF REGIONAL DEVELOPMENT //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1110-1118.
10. Akhmedov B. M. Methods of Calculating Function Range Calculations in Accuracy Assessment. Evaluation of Parametric Determination of Equation //Texas Journal of Engineering and Technology. – 2023. – T. 21. – C. 57-62.
11. Khudoynazarovich T. H. et al. Complex of Anti-Erosion Measures to Increase the Efficiency of Irrigated Lands //Central Asian Journal of Theoretical and Applied Science. – 2022. – T. 3. – №. 10. – C. 194-199.
12. Abboskhonovich M. A. et al. PROCESSES OF INTRODUCING THE DIGITAL ECONOMY ON IRRIGATED LAND //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1126-1131.
13. Maxsimov K. DURABILITY OF REINFORCED CONCRETE PILES IN AGGRESSIVE SOIL CONDITIONS //Spectrum Journal of Innovation, Reforms and Development. – 2023. – T. 21. – C. 270-273.
14. Ibaevich M. K. DESIGN OF BASES AND FOUNDATIONS ON SALINY SOILS //Spectrum Journal of Innovation, Reforms and Development. – 2023. – T. 21. – C. 267-269.
15. Ganiyev Y. Y., Murodilov K. T., Mirzaakhmedov S. S. EVALUATING THE PRECISION OF GOOGLE MAPS IN COUNTRYSIDE REGIONS //ITALY" ACTUAL PROBLEMS OF SCIENCE AND EDUCATION IN THE FACE OF MODERN CHALLENGES". – 2023. – T. 14. – №. 1.
16. Arabboyevna A. M. et al. CREATION OF A SATELLITE GEODESIC BASE ON THE TERRITORY OF THE REPUBLIC OF UZBEKISTAN //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1033-1039.
17. Valievich M. X., Bakhodirjon o’g’li M. B. LARGE-SCALE ENGINEERING AND TOPOGRAPHIC PLANS //Finland International Scientific Journal of Education, Social Science & Humanities. – 2023. – T. 11. – №. 3. – C. 1119-1125.