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THEORETICAL AND PRACTICAL ISSUES IN CREATING POPULATION EMPLOYMENT MAPS USING GIS SOFTWARE.

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Sarimsakov Maqsud Musimovich
Fergana Polytechnic Institute
Khakimova Kamola Rakhimjonovna
Associate Professor of the Department of "Geodesy, Cartography and Cadastre" of Fergana Polytechnic Institute.
E-mail: k.xakimova@ferpi.uz
Kasimova Mavludakhon Kurvanali qizi
Master of Ferghana Polytechnic Institute

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Abstract: This article provides information on the methodology of creating interactive dynamic maps of population employment using GIS programs and cloud technology, as well as the stages of creating interactive dynamic maps and the theoretical and practical issues of developing interactive dynamic maps.

Keywords: . GIS, cartographic, survey, questionnaire, aerospace, web mapping, modeling.

INTRODUCTION.

In the world, population and housing registration is one of the most complex and extensive activities carried out by countries. "For this, the tasks of mapping the entire country, carefully monitoring the population census activities, analyzing the received data, distributing and using them, careful planning, creation and implementation of resources" [1] . These tasks require research on the population, its territorial distribution, age and sex composition, marital status, education, standard of living, living conditions, employment, nationality, citizenship and other demographic, socio-economic characteristics.

In the world, geospatial information is increasingly used, and census methods are being modernized in order to collect accurate and perfect information about the population. In this direction, it is important to effectively use the possibilities of information and communication technologies, which are developing day by day, and to quickly and easily obtain information, process and distribute it by taking open information posted on the Internet into an interactive dynamic card.

In our republic, a number of reforms are being implemented to digitize all sectors of the economy and further improve the quality of services to the population, and significant positive results are being achieved. The 2nd Decision of the President of the Republic of Uzbekistan No. PQ-4699 of April 28, 2020 "On measures for the wide implementation of the digital economy and electronic government" introduces the geographic information system (GIS) in the Republic of Karakalpakstan and the regions, tasks of information integration with the "Electronic Government" system are defined. In this regard, it is important to carry

out scientific research on the integration of digital and other information about the population through interactive dynamic cards.

Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017 "On the strategy of actions for further development of the Republic of Uzbekistan", No. PF-5655 of the President of the Republic of Uzbekistan dated February 5, 2019 " Decree No. PQ-4699 dated April 28, 2020 "On approval of the concept of conducting the population census in the Republic of Uzbekistan in 2022" "Measures for the widespread introduction of the digital economy and electronic government" This thesis research serves to a certain extent the implementation of the tasks specified in the Decision on and other regulatory legal documents related to this activity[2-4].

Relevance of the research to the priority directions of the development of science and technology of the Republic: This research is part of the development of science and technology of the Republic. It was carried out in accordance with the priority direction "Development of information and information and communication technologies".

METHODS.

The analysis of available scientific literature on research shows that S.A. Kovalev, V.A. Kaplov, V.A. Borisov, S.I. Brook, V.M. Medkov and others from the Commonwealth of Independent States scientists play an important role in the study of the population and its research. Studies of the population and demographic processes in Uzbekistan were carried out by scientists such as M.K. Korakhonov, I.R. Mullajonov, E.A. Akhmedov, R.A. Ubaydullayeva, O.B. Ata-Mirzayev, A.S. Soliyev, A.A. Qayumov, K.Kh. Abdurakhmonov, M.R. Boriyeva, Z.N. Tojiyeva. Several outstanding scientists have conducted scientific researches and created cartographic works on the mapping of population and demographic processes. The updating and improvement of socio-economic cartography in Uzbekistan T. Mirzaliyev, A. Egamberdiyev, L. Kh. Gulyamova, J. Nazirov, S. A. Researched in the scientific works of Avezov and other scientists. As a result of rapidly developing research, nowadays in developed countries such as the USA, Canada, Austria, and Russia, most cartographic works are created online with the help of modern GAT technologies. Kraak M-J., Roth R.E., Smith D.A., Nadyrov I.O. in the theoretical study of interactive cards. The contribution of foreign scientists like However, taking interactive dynamic cards in our country, creating a system of interactive dynamic cards of the population of Uzbekistan based on open information of the government of the Republic of Uzbekistan has not yet been sufficiently studied [5-10].

In the research process, methods such as mathematical-statistical, statistical re-checking of the reliability of results, cartographic, GAT, survey, questionnaire,

aerospace, web mapping, modeling were used according to the characteristics of interactive dynamic maps.

RESULTS.

Practical results of the study:

development of a methodology for creating interactive dynamic cards using open data, GAT programs and cloud technology;

development of a model covering the stages of creating interactive dynamic maps and the development of interactive dynamic maps from a theoretical and practical point of view;

DISCUSSION.

As a result of studying the literature on population and demographic processes, the history of the origin of the population of our region, the way it has traveled over the centuries, various invasions in history, the impact of the first and second world wars on the population and demographic processes, and the population growth preliminary digital and textual information about Population geography plays an important role in population studies.

Population geography studies the number, composition and distribution of the population, which is taken into account in the process of social reproduction and in the process of interaction with the natural environment [11-17]. The socio-economic and environmental map is based on the study of the relationship between man and his environment.

Population maps are also important in population studies and research. The history of the development of population geography and population cartography, the first created population maps, the issues of automating the creation of population maps based on GAT technologies and the classification of population maps were analyzed.

The "Population Census" planned to be held in 2023 is an important political event, which will be carried out for the first time after the independence of our country. All normative documents have been developed by the government of our country for this purpose. In particular, the Law "On Census of Population", the decision of the President of the Republic of Uzbekistan on "Census of Population" and "Concept of conducting population census in the Republic of Uzbekistan in 2023" Decree on approval" was adopted. All normative documents used in population registration were studied.

Due to the fact that the population census has not been conducted in our country for many years, there is no accurate information about the population, age-sex composition, territorial location and other socio-demographic changes. Table 1 shows information about population censuses conducted in Fergana region.

Table 1

Census years and population (2022)

	Total population	including:	
		city dwellers	villagers
Farg'ona region	**3896,4**	**2188,5**	**1707,9**
cities			
Farg'ona	299,2	299,2	0,0
Qo'qon	259,7	259,7	0,0
Quvasoy	96,9	54,4	42,4
Marg'ilon	242,5	242,5	0,0
Districts:			
Oltiariq	219,1	164,9	54,1
Qo'shtepa	198,4	76,5	121,9
Bog'dod	223,3	114,4	109,0
Buvayda	236,2	110,7	125,4
Beshariq	234,6	82,4	152,2
Quva	266,0	123,2	142,8
Uchko'prik	237,3	43,2	194,1
Rishton	208,4	132,9	75,4
So'x	80,6	51,1	29,6
Toshloq	209,7	48,5	161,3
O'zbekiston	246,4	106,6	139,8
Farg'ona	220,9	138,5	82,5
Dang'ara	180,8	42,2	138,6
Furqat	121,8	28,6	93,1
Yozyovon	114,7	69,0	45,7

Currently, a number of foreign countries have introduced the use of interactive dynamic cards for population registration. This serves to increase the accuracy and efficiency of the population registration process.

Interactive dynamic cards are created online based on digital and electronic cards. These cards are developing in an interconnected manner (Figure 1).

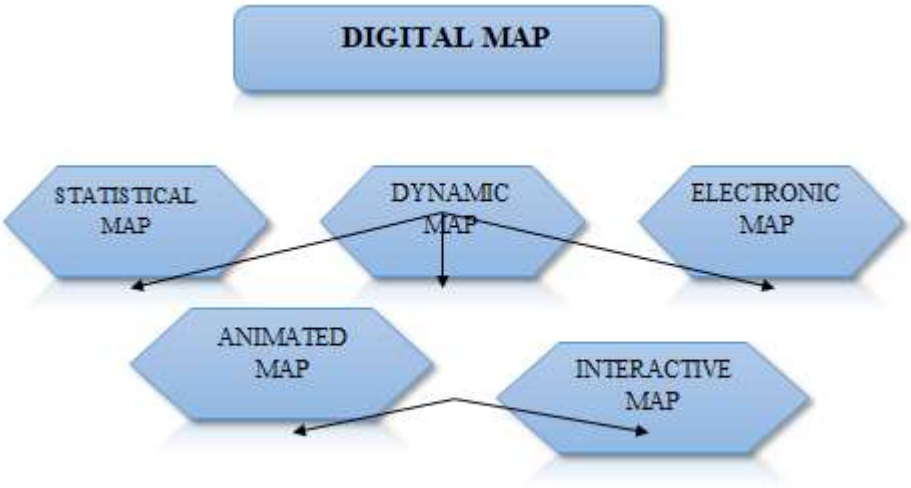

Figure 1. Cards related to digital cards.

Open data used to create interactive dynamic maps and the issues of connecting and using them through interactive maps are considered. Digital data on the population from the government's open data portal was used to integrate the data.

An interactive dynamic map of the population based on tabulation of data was created using ArcGIS online and QGIS programs. Information was entered on Fergana region and Fergana city [18-23].

In order to create an interactive dynamic map of the population of Fergana region, a population data table was developed based on the digital data of the General Directorate of Statistics of Fergana region (Table 1).

Based on the table, the first interactive dynamic card of residents of Fergana city was created. Information was entered in Uzbek, Russian, and English languages, and the method of creating the map was developed (Fig. 3). ArcGIS online and QGIS programs were effectively used to create interactive maps.

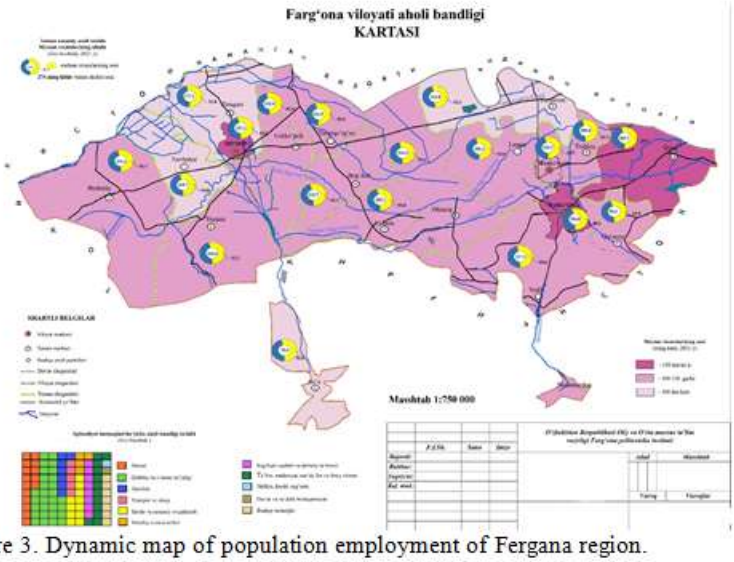

Figure 3. Dynamic map of population employment of Fergana region.

Interactive dynamic cards were hierarchically reduced to the level of the region, Fergana city and Fergana district.

In the study, suggestions and recommendations were made regarding the method of creating interactive dynamic cards and the advantages of their use, the possibility of using these cards on a large scale around the world, and their importance in solving various issues:

1. Interactive dynamic cards created online serve to increase access to open information and solve theoretical and practical issues.

2. The high availability of geographic data and information and communication technologies for creating interactive dynamic maps indicates the level of open use of these maps via the Internet.

3. The creation of online interactive dynamic maps is a new stage in the development of socio-economic cartography, and these maps are not limited to a specific shell, but allow open use on a global scale.

4. As a result of the reforms carried out in our country, the level of use of interactive services, open information of the government and cloud technologies is increasing. It is desirable to display such information on interactive dynamic cards and expand the scope of their use.

5. It is appropriate to use the developed method of creating interactive dynamic maps to create online maps of regions, districts, cities and neighborhoods [24-28].

CONCLUSION

Based on the research, the following conclusions were drawn:

1. A table was developed based on the years of registration of population employment of Fergana region (2020, 2021, 2022) and data collected as a result of registration (total population, urban and rural population, etc.). After the independence of Uzbekistan, the first population census will be held in 2021. The last and most reliable source of census history is the 1989 data in the table. The population census to be held in 2021 will provide the most accurate and reliable information about the population;

2. Population geography and cartography were studied from a theoretical and practical point of view as a basis for creating dynamic maps of population employment, and several maps according to the classification of population maps developed by Prokhorova (population map of Surkhondarya region, map of natural movement of urban residents, ethnoconfessional population map of Tashkent region) card and Labor resources and population employment card) were analyzed. The result of the conducted analysis allows to separate the thematic cards related to the population from each other according to their classification;

3. As a result of the reforms carried out in our country, the level of use of interactive services, open information of the government and cloud technologies is increasing. It is desirable to display such information in interactive dynamic cards and expand the scope of their use;

4. The model, which includes five stages of creating interactive dynamic maps, was developed based on new cartographic methods (interactive signs, web mapping). The initials of the names of Fergana region, districts, and cities are entered on the map based on interactive symbols, and information about the population is placed on these symbols in Uzbek, Russian, and English languages.

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