UDC: 338:004

ANALYSIS OF THE EFFECTIVE ORGANIZATION OF POPULATION CENSUS PROCESSES BASED ON DIGITAL TECHNOLOGIES

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Abstract: *This article presents an analysis of the state of effective organization of population census processes based on digital technologies, as well as research findings on the opportunities and challenges of using digital technologies in these processes.*

Key words: *digital technologies, population census, CAPI, PAPI , CAWI, CATI technology.*

INTRODUCTION

In the current economic world, digital technologies and their use are developing more and more, and the use of information and communication technologies is gaining importance in every sphere of society. The work that usually requires a lot of manual labor, workers and paper for a long time is being done easily and quickly with the help of modern technology. This, of course, had an impact on the processes of population registration in countries around the world.

In almost all countries, the main questions in the questionnaires during the population registration process are the same, and they may have different questions depending on the political and social importance of the state.

Based on all the questions in the questionnaires, it will be possible to divide them into categories.

1. Questions about the place of residence, migration and geographical features of the population (it will be possible to clarify questions about internal and external migration from questions such as place of residence, place of birth, temporary and main place of residence).

2. Questions about the demographic characteristics of the population (gender, age, date of birth, marital status, number of children (in some countries, questions such as total births and survivors, girls or boys are included))

3. Economic characteristics (including employment, sources of funds for living, including monthly salary, pension, benefits, etc.)

4. Characteristics of the population related to education (including knowledge of languages, general education (primary, general secondary education, secondary special vocational, higher education, higher education further education))

5. Ethnic characteristics (there are also questions about nationality, mother tongue, religion in some countries)

6. Characteristics of the population's health (questions related to the population's health may be raised (mainly for persons with disabilities: walking, hearing, vision, etc.))

RESEARCH METHODOLOGY

The following is a summary of the 2010 round and the 2020 round of population registration. (Table 1) Table 1Duration of population registration processes

CIS member states	Round 2010	Round 2020
	Duration of time (days)	Duration of time (days)
Azerbaijan	10 days	10 days
Armenia	10 days	10 days
Belarus	11 days	27 days
Kazakhstan	10 days	60 days
Kyrgyzstan	10 days	10 days
Moldova	14 days	90 days
Russia	12 days	31 days
Tajikistan	10 days	15 days
Turkmenistan	12 days	11 days
Uzbekistan		25days(during testing)

In the resolution of the United Nations in 2015, it was recommended that its member states conduct a population census once every ten years. Therefore, in the following years, this process was implemented or planned in many countries.

A number of CIS member states (Azerbaijan, Belarus, Kazakhstan, Russia, Tajikistan (Table 1)) have conducted population censuses in 2019-2021, while several have changed the main scheduled time due to the COVID-19 pandemic. . In particular, Armenia, Moldova, Kyrgyzstan, Turkmenistan and Uzbekistan plan to conduct the population census in 2022-2024. (Table 2)Table 2

2020 Census of the Commonwealth of Independent States (as of December 2021)

CIS member states	Initial census dates	Census dates changed due to the COVID-19 pandemic
Azerbaijan	October 1-10, 2019	
Belarus	October 4-30, 2019	
Kazakhstan	October 1-30, 2020	September 01-October 30, 2021
Russia	October 1-31, 2020	October 15 - November 14, 2021
Tajikistan	October 1-15, 2020	
Armenia	October 18-27, 2020	October 13-22, 2022
Moldova	April 2023	2024
Kyrgyzstan	March 23- April 1, 2020	March 25-April 3, 2022
Turkmenistan	December 17-27, 2022	
Uzbekistan	November 01-25, 2022	01-25 November 2023

The relevance of the issue is that today, in the implementation of digital technologies in the processes of population registration in the countries of the world, through the full application of existing information and communication technologies and systems to the process, accurate and reliable data collection and processing on the basis of convenient conditions. performance is one of the main goals.

Data collection is usually done using a paper questionnaire, and this method is called PAPI (Pen and Paper Interviewing).[4] Many countries of the world are still using this method in various fields and processes. However, due to the demand of the times and the rapid development of digital technologies, new methods using modern information

communication technologies and systems are being used to organize questionnaires in various fields and processes.

The reason for the relevance of the population census at the level of state importance is that it is possible to get accurate and more extensive information in this way. The collection of personal data can also be carried out by using information and communication technologies, taking into account the requirements for ensuring information security.

ANALYSIS AND RESULTS

According to the results of the research, data collection using CAPI, CATI, CAWI methods is replacing PAPI (paper questionnaires) in many countries of the world.

Looking at world experience, comparing the population registration processes of 2010 and 2020, it can be seen that the rate of use of digital technologies is extremely high in most countries in 2020.

As an example of this, the information in the table below shows the increase in the level of use of digital technologies in the population registration processes of several CIS countries. (Table 3)

Table 3

Indicator of use of digital technology in population registration processes of the CIS countries (in %)

CIS member states	2010	2020		
	Use of paper questionnaires in registration	Use in registration		Filling out online registration questionnaires by the population themselves
		From paper questionnaires	From electronic devices	
Azerbaijan	100	100	-	-
Armenia		-	100*/25	-
Belarus		-	76/2*	22
Kazakhstan		-	60	40
Kyrgyzstan		-	100	-
Moldova**		-	81	19
Russia		-	77/5*	18
Tajikistan		60	25	15
Turkmenistan		-	100	-
Uzbekistan**	-	-	90	10

*population register/administrative data

**is planned to be held

From the data in the table, it can be seen that in the following years, the rate of introduction of digital technologies in population registration processes has increased significantly in many countries.

Only in the Republic of Azerbaijan, this process was carried out 100% by filling out the traditional paper questionnaire, and among the CIS countries, the Republic of Belarus was the first country to implement this process using 100% digital technologies. ldi An important aspect of this is that 22% of the population filled out questionnaires on the

Internet. In Kazakhstan, 40% of the population independently participated in this process through the Internet.

In the 2010 round of population registration in other foreign countries, the level of internet and tablet use was also high. In particular, the use of the Internet and tablets during population registration was 34% in Lithuania, 63% in Estonia, 54% in Canada, 41% in Bulgaria, 10% in Australia, and this indicator was 100% in Brazil. It can be seen that the use of digital technologies in population registration processes around the world is growing rapidly.

So, in addition to the convenience of using digital technologies, there is also an economic aspect, which should be considered. Table 4 below shows the cost per person for the 2010 round of population registration, which was conducted 100% paper-based, and the 2020 round, which also used digital technologies.

Table 4

Registration costs per person

(USD, valuation at average annual rate)

CIS member states	Round 2010	Round 2020
Azerbaijan	1,03	1,8
Armenia	1,57	1
Belarus	1,53	0,57
Kazakhstan	2,9	1,1
Kyrgyzstan	1,12	1,2
Moldova	2,15	assessment is carried out according to the results of the population census
Russia	3,81	3,6
Tajikistan	1,31	Evaluation not done

CONCLUSIONS AND SUGGESTIONS

In conclusion, it can be said that from the above data, in the Republic of Belarus, which has 100% use of digital technologies, the cost of registration per person has decreased from 1.53 US dollars to 0.57 US dollars.

More precisely, the difference in registration costs per person is 1.53-0.57=0.96 US dollars, and this indicator is compared to the population of the Republic of Belarus as of October 1, 2019. If sold, it means a profit of more than 9 million US dollars.

Or, if we consider the example of the Republic of Kazakhstan, the use of digital technologies reduced the cost of registration per person from 2.9 US dollars to 1.1 US dollars. taking into account the registered permanent population of 19186015 people, it can be seen that there was a profit of more than 34 million US dollars.

Or, if we consider the example of the Republic of Azerbaijan, that is, in the 2020 round, to be more precise, taking into account the fact that 100% of the population in 2019 was registered using the paper method, the cost of registration per person was estimated at 1.8 US dollars, and this is the total in the account is more than 18 million US dollars. If we conclude from the above, the use of digital technologies could significantly reduce this amount.

It can be concluded from the world experience in the use of digital technologies in population registration processes that the higher the digitalization of these processes, the more it will be possible to reduce the costs, as well as reduce the number of labor force involved in this process.

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