

Do Croatian Citizens Want the Digitalization of Elections? Differences in Socio-Demographic Characteristics

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Abstract - In modern society characterized by a fast-paced lifestyle, digitalization at all levels is certainly a tool that makes this fast-paced life easier. Elections, regardless of whether they are at the local or national level, are one of the key events in every society. The aim of this paper is to investigate whether the citizens of the Republic of Croatia want the digitalization of elections, and to see whether the attitudes of citizens differ according to sociodemographic characteristics. The research was conducted by ZRIN Institute on a representative sample of citizens of the Republic of Croatia (n=650) using the survey method. The results showed that most citizens want the digitalization of elections (69.5%). The results of multivariate statistical analyzes showed that there are no statistically significant differences in the desire of digitalization regarding sex and place of residence. On the other hand, there are statistically significant differences regarding age group and level of education. Apart from the scientific contribution, the results of this research have strong practical implications that will be discussed in the paper.

Keywords - digitalization of elections, Republic of Croatia, e-voting, socio-demographic characteristics

I. INTRODUCTION

In modern society, digitalization has become a usual part of everyday life. We can do all activities online - from shopping to ordering food and paying bills. The digital system greatly facilitates the accelerated life of people. Digitalization of elections is one of the options that states can implement. Since the turnout for elections in Croatia is very low, about 46.9% (parliamentary elections) [1], it seems important to study this topic.

Prosser and Krimmer talk about four dimensions of the country's readiness to implement e-voting: (1) politics, (2) law, (3) technology, (4) society. The fourth dimension - society - refers to the degree of political participation and citizens' attitudes towards the implementation of e-voting, as well as their use of technology in general [2].

The aim of this paper is to investigate whether the citizens of the Republic of Croatia want the digitalization of elections, and to see whether the attitudes of citizens differ according to sociodemographic characteristics.

Croats are very active on social networks, about 70% of population actively use them every day, which is a high proportion compared to, for example, Germany, where this percentage is 55%, or France, where this percentage

is 45% [3]. Likewise, the 2021 census, where 1,157,000 citizens were successfully registered [4], is also proof of the e-activity of Croatian citizens. Such data give the wind behind the idea of implementation of e-voting in the Republic of Croatia, considering the discrepancy between the turnout for elections using the pen-and-paper method at the polling station and the activities of Croats in the virtual world, especially when we talk about the participation of young people. The topic of e-voting in Croatia is also important because of the large number of Croats who live outside Croatia around the world and have the right to vote in elections [5].

Research has shown that the implementation of e-voting can significantly increase the participation of those who have not voted so far [6]. A survey conducted in the Netherlands in 2018 showed that 53.03% of people want to vote via computer, 1.19% via e-mail, and 18.66% want the implementation of voting via the Internet in general [7]. Research conducted on Polish citizens showed that Poles generally support the implementation of e-voting and have a desire to vote online, although the topic of e-voting is underrepresented in the media space [8].

II. HYPOTHESES AND METHODOLOGY

A. Hypotheses

The aim of this paper is to investigate whether the citizens of the Republic of Croatia want the digitalization of elections, and to see whether the attitudes of citizens differ according to sociodemographic characteristics. Considering the aim of the research, the following hypotheses were constructed:

H1: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding *sex*

H2: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding *place of residence*

H3: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding *age*

H4: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding *level of education*

B. Methods and procedure

The quantitative method of a telephone survey was used in the research. The data collection instrument was a questionnaire. The questionnaire consisted of the question "To what extent do you want electronic voting to be implemented in the Republic of Croatia?" (1-5 degree scale), and questions related to the socio-demographic characteristics of the participants - age, sex, place of residence, and level of education. The research was conducted in September and October 2022.

C. Sample

The sample in this research was random and representative for the general population of the Republic of Croatia. The company *Significo* conducted the survey according to the instructions of ZRIN Institute. The Sample size was n=650. The sample was representative according to **sex** (45.2% male; 54.8% female), **age** (18-24 years 6.5%, 25-34 years 14%, 35-44 years 21.4%, 45-54 years 17.8%, 55-64 years 12.8%, 65+ years 27.5%), **place of residence** (village 7.4%, town (up to 20k residents) 6.3%, a medium-sized city (20-50k residents), a bigger city (more than 50k residents) 48.9%, City of Zagreb 30.2%), **level of education** (elementary school 3.4%, high school 46.8%, bachelor degree 20.2%, master degree 27.7%, PhD 2%). Table 1 shows a comparison of the structure by age in the sample and the population.

Table 1 – Age population and sample structure

	% (sample)	% (population)
18-24	7,7	10,34
25-34	15,3	11,45
35-44	24,8	13,53
45-54	18,3	13,46
55-64	12,3	14,65
65+	21,6	22,34

III. RESULTS

In general, all groups want digitalization of elections (Mean>2.5). In percentage terms, 69.5% of the total number of respondents agree and fully agree with the implementation.

Descriptives

Tables 2-5 show the frequencies of responses to the item "To what extent do you want electronic voting in elections to be implemented in Croatia?" on a scale from 1 to 5, where 1 represents "I don't want at all" and 5 represents "I totally want to". According to the data presented, the highest percentages are at level 5, from 31.8% (age 65+) to 65.5% (age 35-44) (except in the group 'elementary school', Table 4). It can also be noted that for part of the groups, the number of responses at level "2" is 0%, that is, if there is no desire to implement electronic voting, then it is at level "1 - I don't want at

all". The percentage of people who marked level 1 is from 0% (people with PhD) to 11.2% (age 65+).

Table 2 - Frequencies regard to sex - *To what extent do you want electronic voting in elections to be implemented in Croatia?* (%)

	(1)	(2)	(3)	(4)	(5)
Male	7.8	2.0	17.3	20.7	52.0
Female	4.5	2.5	26.1	22.5	44.4

Legend: (1) - I don't want at all; (2) - Mostly, I don't want; (3) I neither want nor want; (4) - Mostly, I want; (5) - I totally want to

Table 3 - Frequencies regard to regard to place of residence - *To what extent do you want electronic voting in elections to be implemented in Croatia?* (%)

	(1)	(2)	(3)	(4)	(5)
Village	10.4	0.0	22.9	22.9	43.8
Town (up to 20k residents)	4.9	0.0	22.0	17.1	56.1
A medium-sized city (20-50k residents)	6.4	0.0	23.4	23.4	46.8
A bigger city (more than 50k residents)	6.9	3.8	22.0	23.0	44.3
City of Zagreb	3.6	1.5	21.9	19.9	53.1

Legend: (1) - I don't want at all; (2) - Mostly, I don't want; (3) I neither want nor want; (4) - Mostly, I want; (5) - I totally want to

Table 4 - Frequencies regard to regard to age - *To what extent do you want electronic voting in elections to be implemented in Croatia?* (%)

	(1)	(2)	(3)	(4)	(5)
18 - 24 years	4.8	0.0	31.0	23.8	40.5
25 - 34 years	4.4	0.0	26.4	24.2	45.1
35 - 44 years	4.3	0.7	11.5	18.0	65.5
45 - 54 years	2.6	2.6	19.8	20.7	54.3
55 - 64 years	4.8	1.2	20.5	22.9	50.6
65+ years	11.2	5.6	28.5	22.9	31.8

Legend: (1) - I don't want at all; (2) - Mostly, I don't want; (3) I neither want nor want; (4) - Mostly, I want; (5) - I totally want to

Table 5 - Frequencies regard to regard to level of education - *To what extent do you want electronic voting in elections to be implemented in Croatia?* (%)

	(1)	(2)	(3)	(4)	(5)
Elementary school	13.6	0.0	45.5	22.7	18.2
High school	4.9	3.3	26.0	23.0	42.8
Bachelor's degree	8.4	1.5	14.5	25.2	50.4
Master's degree	5.6	1.7	18.9	16.7	57.2
PhD	0.0	0.0	15.4	23.1	61.5

Legend: (1) - I don't want at all; (2) - Mostly, I don't want; (3) I neither want nor want; (4) - Mostly, I want; (5) - I totally want to

The statistical method of analysis of variance (ANOVA) was used to test the hypotheses.

In the variance analysis, the dependent variable was the particle "To what extent do you want electronic voting in

elections to be implemented in Croatia?" which was treated as a pseudo-interval scale in the test. The independent variables were sex, age group, place of residence, and level of education.

H1: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding sex

Table 6 shows average values (mean) for the desire for digitalization of elections in Republic of Croatia regarding to sex.

Table 6 – Differences regarding to sex (descriptives)

	Mean	Std. Deviation
Male	4.07	1.22
Female	4.00	1.10

The ANOVA results showed that there is no statistically significant difference between men and women in the desire for digitalization of elections, $F(1, 648) = 0.665$, $p = 0.415$, $1-\beta=0.144$. H1 hypothesis is rejected.

H2: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding place of residence

Table 7 shows average values (mean) for the desire for digitalization of elections in Republic of Croatia regarding to place of residence.

Table 7 – Differences regarding to place of residence (descriptives)

	Mean	Std. Deviation
Village	3.90	1.28
Town (up to 20k residents)	4.20	1.10
A medium-sized city (20-50k residents)	4.04	1.14
A bigger city (more than 50k residents)	3.94	1.2
City of Zagreb	4.17	1.05

The ANOVA results showed that there is no statistically significant difference between the desire to implement e-voting with regard to the size of the place of residence, $F(4, 645) = 1.616$, $p = 0.169$, $1-\beta=0.62$. H2 hypothesis is rejected.

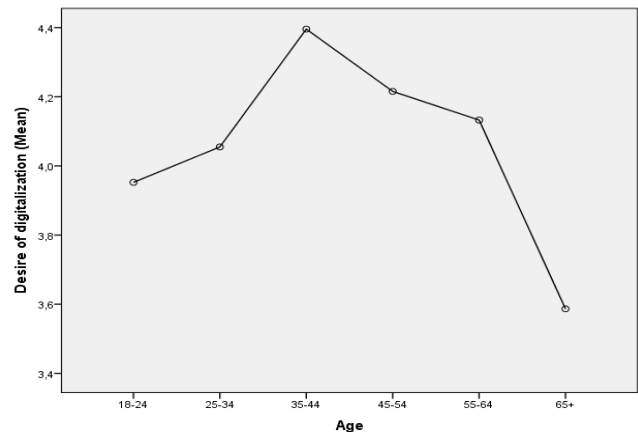
H3: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding age

Table 8 shows average values (mean) for the desire for digitalization of elections in Republic of Croatia regarding to age.

Table 8 – Differences regarding to age (descriptives)

	Mean	Std. Deviation
18 - 24 years	3.95	1.08
25 - 34 years	4.05	1.06
35 - 44 years	4.40	1.02
45 - 54 years	4.22	1.02
55 - 64 years	4.13	1.09
65+ years	3.59	1.23

ANOVA results showed that there is a statistically significant difference between the desire to implementation of e-voting regarding to age, $F(5, 644) = 9.416$, $p < 0.05$, $1-\beta=0.99$. H3 hypothesis is accepted. In order to see between which groups there is a statistically significant difference, the Games-Howell post hoc test was used. The test showed that there is a statistically significant difference in the desire of implementing e-voting between people in the 65+ age group and other age groups except for the 18-24 age group. H3 hypothesis is accepted. Differences by age groups are visible in Graph 1.



Graph 1 – Desire for digitalization regarding to age

H4: There is a statistically significant difference in the desire for digitalization of elections in Republic of Croatia regarding level of education

Table 9 shows average values (mean) for the desire for digitalization of elections in Republic of Croatia regarding to level of education.

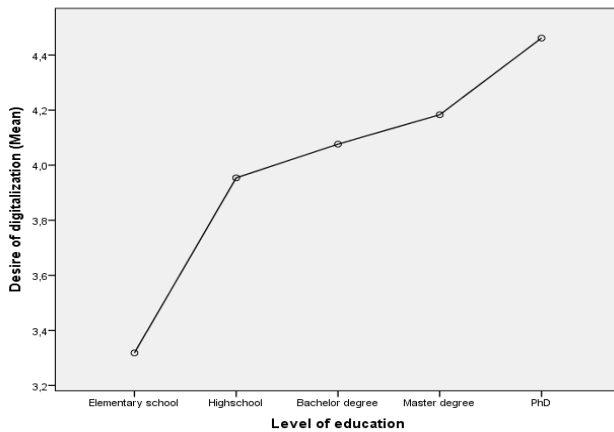
Table 9 – Differences regarding to level of education (descriptives)

	Mean	Std. Deviation
Elementary school	3.32	1.21
High school	3.95	1.13
Bachelor's degree	4.08	1.21
Master's degree	4.18	1.14
PhD	4.46	0,78

ANOVA results showed that there is a statistically significant difference between the desire of implementation of e-voting with regard to age, $F(4, 645) = 3.783$, $p = 0.05$, $1-\beta=0.96$. H4 hypothesis is accepted. The Games-Howell post-hoc test revealed a statistically

significant difference between people with primary school education and people with a master's degree or PhD.

Differences according to level of education can be seen in Graph 2.



Graph 2 – Desire for digitalization regarding to level of education

IV. DISCUSSION AND CONCLUSION

Two out of four hypotheses were confirmed in this paper. Differences were not found regarding the desire for digitalization of elections by sex, which means that both men and women equally want the implementation of e-voting. This finding is consistent with previous findings [9]. Also, no differences were found regarding the size of the place of residence. This finding can be interpreted as the fact that the Internet and the virtual world are mostly available in all parts of Croatia.

Statistically significant differences were found regarding the level of education and the age of the respondents. The finding regarding age is expected since younger people are more inclined to use modern technology than older people are. The findings are also consistent with previous findings [9]. One research showed that e-voting will be chosen to the greatest extent by people aged 18-24 [7]. A recent survey (2022) in Lithuania conducted on young people aged 19 to 29 showed that 73.1% of them choose the method of electronic voting via the Internet over other methods [10]. Research conducted in Greece on the student population showed that students are informed about what e-voting is and have positive attitudes about e-voting [11].

When we talk about the level of education, we can say that the findings are also expected since people with a higher level of education are generally ready to participate more [12] and are more open to changes than people with a lower level of education [13].

Limitations

This research comes with certain limitations. First, although the sample is representative of the general population of the Republic of Croatia in terms of socio-demographic characteristics, this data should be taken with a grain of salt since people who are more willing to participate politically are more willing to participate in survey research than others are. In addition, it should be emphasized that these results are an indicator of the public opinion of citizens at the time when the research was conducted (September-October 2022), and citizens' attitudes can change depending on the context and circumstances. For example, in the event of a major global hacker attack, citizens' trust in digitalization could significantly decrease, and thus the desire to implement e-voting. In addition to the mentioned limitations, further research of citizens' attitudes about the digitalization of elections is needed, with the included factors of socio-demographic variables, as well as other factors.

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