

Research Article

Effectiveness of the Online Election via E-Voting Based on Community Response

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Abstract.

The election of RT/RW leaders is a regular event that takes place in every village across Indonesia. Similarly, the election process was carried out at RW 23 Permata Biru housing area, located in Cinunuk Village, Cileunyi District, Bandung City Regency, West Java Province, Indonesia. The leadership of RT/RW is elected every 5 years, and in this instance, the election process occurred in November-December 2021, determining new leaders for the 2022-2027 term. However, the election faced a challenge due to the restrictions imposed by the Indonesian government related to the Covid-19 pandemic. Gathering in large groups was not permitted to curb the spread of Covid-19. Despite these circumstances, the transition of RT/RW leaders was considered crucial to avoid potential conflicts within the community. As a result, an alternative solution was implemented, conducting an online election using the E-Voting application. Through explanations and community outreach in RW 23, the people were receptive to the idea of conducting the election online, considering the ongoing Covid-19 pandemic. RW 23 comprises 732 families, divided into 10 RTs. The election process took place in two stages: first, the election of the leader of RW 23, followed by the election of the leaders of the RTs. The selection of the RW 23 leader began with the formation of a committee, followed by the dissemination of rules, candidate selection, and further outreach. The election itself was conducted through the E-Voting application. The E-Voting software was created using Google Form Apps, with the assistance of Microsoft Excel. Community members accessed the E-Voting application through their PCs and smartphones. Despite the challenges, the election of the RT/RW leaders proceeded smoothly and safely. As a result, a new team of RT/RW leaders was formed for RW 23, serving during the 2022-2027 period.

Keywords: online election, leader rt/rw, pandemic, Covid-19, e-voting

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1. Introduction

The development of information technology continues to run rapidly over time, requiring people to continue to innovate and come up with ideas for future progress so that life can be better and useful for the next generation [1]. Information technology has been applied in various fields including cigarette smoke detection systems [2], adaptation of learning systems [3] [4], traffic analysis [5], toll road gates [6], as well as various other technology applications, including in the general election or voting process [7]. Permata Biru Housing, located in Cinunuk Village, Cileunyi sub-district, Bandung district, is entering a transitional period of RT/RW management for the 2022/2027 period, especially in the RW 23 area which has 10 RT [8]. Figure 1 shows a map of the location of Cinunuk Village.

The process of selecting the new RT/RW's chief in the area of RW 23 was held in November-December 2021. The problem faced is the Covid-19 pandemic, which is still very vulnerable if residents gather in one place [9].

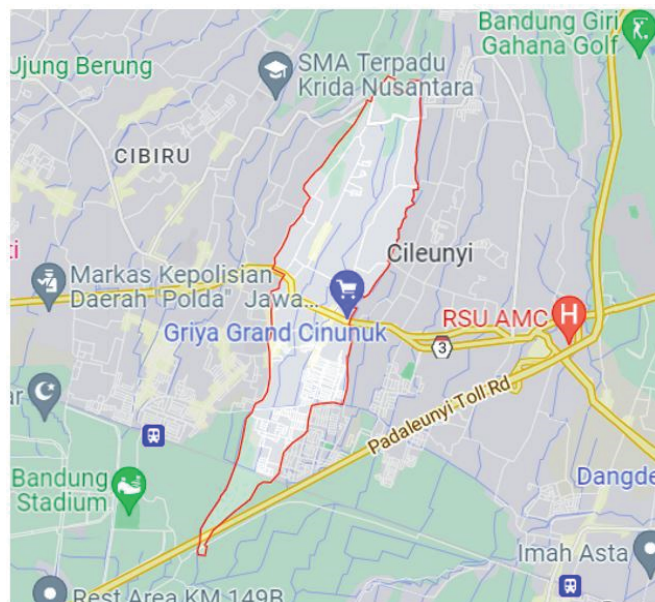


Figure 1: Map of the location of Cinunuk Village, Cileunyi District, Bandung Regency, West Java.

The proposed solution is that the election is carried out by applying information technology, namely the election held by online [10]. Through the online method, it is hoped that it can solve the problem of the Covid-19's spread risk and the prohibition of people gathering, so that the transition process of RT/RW management is not hampered.

An online election or voting, also known as e-voting, is a method of voting and counting votes in an election using electronic devices [11], [12]. The scheme of e-voting

is a set of protocols that maintains the security and confidentiality of voters in conducting elections, counting votes, and interacting with the election committee [13].

The process of selecting the head of the RT/RW in the neighborhood of RW 23 Permata Biru Housing previously used a conventional election system. Elections are carried out by punching ballots on a sheet of paper. The public is invited to attend the polling place (TPS). The problems that arise in the implementation of conventional elections are generally due to the atmosphere of the Covid-19 pandemic. The transfer of RT/RW management within RW 23 fell in early 2022, so the Head of the Cinunuk Village Administration gave a mandate to the head of RW 23 for the previous period to carry out the election process from November to December 2021 [14]. At that time, the government still imposed restrictions on community activities (PPKM) so that the implementation of conventional elections was not possible [15].

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Based on the description of the main problems mentioned above, the service team agreed to help the community of RW 23 Cinunuk Village to carry out Community Service (PKM) in the form of Design and Implementation of the Online RT/RW Chair Election in Cinunuk Village, Cileunyi District, Bandung Regency, through the Research Institute's PKM program and Community Service (LPPM) Bandung Islamic University (UNISBA) [16], in collaboration with the Faculty of Mathematics and Natural Sciences (FMIPA) UNISBA [17], and the UNISBA Mathematics Study Program [18]. The Service Team collaborated with the RW 23 Management who was still in office at that time to form an online RT/RW Chairman election committee in RW 23. The committee chair was appointed by the RW 23 chairman, and committee members were recruited evenly from residents of RT 01 to RT 10 in the RW 23 area.

2. Method

2.1. Tools and Materials

The equipment and materials needed for the election of the chairman of the RT/RW are divided into several parts, including the service provider section (e-voting application), the voting community (users), as well as equipment and materials related to administration and secretariat. The e-voting application used is the Google Form application with special form settings for online voting media. In the process of setting the form, other applications are needed, including Microsoft Excel and PowerPoint.

Users or users are people who will carry out the voting or election process online. Users need a device that accesses the e-voting application, such as a desktop computer, laptop, tablet, or smartphone. The public, especially the heads of families today, generally have smartphone devices that are capable of accessing e-voting applications. People prefer smartphones because they are simpler and easier to use. Applications that must be available on the user's part are website and social media applications for information and communication media. The social media application used by the committee is the Whatsapp application because almost all citizens use it.

In the administration and secretarial sections, the equipment and materials needed are banners, posters, identity cards (ID Card), family cards, and notification letters. Banners and posters were used to disseminate information about the election of RT/RW heads. ID cards and family cards are used to validate citizens who have the right to vote, and family cards are used as unique codes or tokens when citizens vote online. The notification letter was distributed by the committee to the entire community of RW 23 accompanied by posters and election rules.

However, in practice there are still residents who are not ready to vote online. Some residents want to conduct elections conventionally due to various factors, including not having adequate smartphone devices, lack of understanding about online voting mechanisms, and some people still do not believe in elections using technology devices. Therefore, the committee in addition to preparing the tools and voting system online, also still has to prepare the tools and voting systems offline or conventional, as was usually done in the previous period of the election process for the Chairman of RW 23.

2.2. Implementation Method

The method of implementing the online election of RT/RW chairman begins with the formation of a committee, the design and preparation process, and the implementation

of an online election. The steps for implementing the online RT/RW chairman election in RW 23 are as follows:

1. Initial meeting of the chairman of RW 23 and the heads of RT 01-10 with the Service team to design and prepare for the election of the new RW chairman
2. Formation of Committees and division of tasks for the preparation of elections
3. Preparation of rules, schedules, stages of election, and citizen data collection
4. Selection of candidates for RW 23 chairman, preparation of banners, posters, and e-voting applications
5. Announcement of candidates for RW chairman and online campaign
6. Installation of banners, posters, and distribution of notification letters to residents of RW 23
7. Implementation of the election online
8. Announcement of elected RW 23 Chairman
9. Election of Head of RT 01 to RT 10
10. The committee report to the previous Head of RW 23 regarding the election results
11. Handover of positions by the Head of Cinunuk Village

3. Result and Discussion

3.1. Design and Preparation

Preparation begins with the formation of an election committee. The preparatory meeting was chaired by the Head of RW 23 and the heads of RT 01-10. Committee members are recruited from the community of RT 01-10 who have the ability, are willing to work as an election committee, and have free time. Figure 2 shows the coordination meeting for the formation of the committee.

The next activity is the preparation of regulations, designing banners, posters, and e-voting applications. The rules include the requirements for the candidates for the chairman of RW 23 and preparation for the selection of candidates for the chairmanship of RW 23.

2. Selection of Candidates for Head of RW 23

The screening is carried out by first disseminating information to the community of RW 23 about the opening of the registration for the new candidate for the chairman of RW 23. Furthermore, the selection process from prospective candidates to candidates



Figure 2: Coordination meeting and committee formation.

is carried out by the committee by considering several things, including validation of residents of RW 23, readiness to serve as chairman of RW 23, experience as a minimum administrator in RW 23, free time, busy work, educational background, and a history of good behavior. Figure 3 shows the results of the selection of candidates to become candidates for the chairman of RW 23 for the period 2022-2027. There are several prospective RW 23 chairman candidates who have registered. The committee decided that in the selection process, the final results would be 3 candidates for the chairman of RW 23. The selection process was carried out offline.



Figure 3: Selection of candidates for chairman of RW 23 Cinunuk Village for the 2022-2027 period.

3.2. Information Submission of Candidates for Chair of RW 23

The next process is the delivery of information to the public about the candidates for RW 23 chairmanship. Information is conveyed through banners, posters, and notification letters that are delivered directly to each family head in the RW 23 community. Figure 4 shows the announcement banners for the candidates for RW chairman 23. The preparation of the banners involved the committee and non-committee residents, including during the process of installing banners in various locations.



Figure 4: Installation of banners for the candidates for the Chair of RW 23 by the Committee and the Community.

Banners were distributed by placing them at various locations in RW 23. Apart from banners, information dissemination on the candidates for the chairman of RW 23 was also conveyed through posters. Figure 5 shows the design of one of the posters for the candidates for the chairman of RW 23.

There are several poster designs prepared by the committee. All designs are distributed through social media networks, including the WhatsApp application which is used by almost the entire community of RW 23. Each design is posted at intervals of 3 days. The total time for delivering information to the public is approximately 2 weeks.



Figure 5: Poster for Candidate for RW 23 Chairman.

3.3. Vision-Mission Campaign for RW 23 Chair Candidates via YouTube

In the process of delivering information on the candidates for the chairman of RW 23 to the public, there were several residents who proposed the implementation of the vision-mission campaign of the candidates. The committee previously received information that the implementation of the candidates' campaigns often caused conflicts in the community, in addition to the implementation of PPKM it also indirectly prohibited the public from carrying out campaigns. As an alternative solution, the committee made a video of the vision-mission campaign delivery and distributed it through the Youtube



Figure 6: Shooting video for the online campaign for the RW 23 Chair candidate.

application. Figures 6 and 7 show the shooting process and the appearance of the vision-mission campaign video of the candidates for the head of RW 23.

3.4. E-Voting Application

The E-Voting application is made using the Google Form application. The design of the E-Voting application is made as simple as possible so that it can be easily understood and used by the community in RW 23. Figure 8 shows the display of E-Voting which was disseminated to the public during the election.

The people of RW 23 are quite enthusiastic about welcoming the process of electing the chairman of RW 23 online through e-voting. Several residents expressed the ease and flexibility of conducting online elections using an e-voting application compared to the conventional election process. Residents said that their holiday activities were not disturbed because they could cast ballots anywhere according to the predetermined time limit. People who work also feel that it is easy because they can participate in expressing their right to vote without disturbing their work activities.

3.5. Some People Choose Conventionally

However, some people still want to channel their voting rights in a conventional way. The committee provides these facilities for people who are not willing to vote through the e-voting application, and prepares voting cards for conventional voting. Figure 9 shows the ballot cards prepared by the committee.



Figure 7: Video display of the Vision-Mission campaign of the candidates for the Chair of RW 23.

The election process was conventionally carried out by the committee using the pick-up method, namely the committee went to residents' homes, submitted ballots, and residents were asked to cast ballots directly behind closed doors, and at that time they were handed back to the committee. This method is carried out to avoid crowds of residents due to Covid-19. Some residents who were not able to be found by the committee attended the secretariat of the committee to vote. Figure 10 shows the secretariat of the committee to display the voting results online and also offline or conventionally.

7. Vote Counting

The next process after voting for the candidate for chairman of RW 23 is the vote counting process. The results of incoming votes online, the results can immediately be seen through the response window on the Google form application. These results

Pemilihan Online Ketua RW 23 Periode 2022-2027 (Akses dibuka Pkl. 09.00-13.00)

Perumahan Permata Biru, Desa Cinunuk Kecamatan Cileunyi Kab. Bandung, Minggu, 19 Januari 2021. Waktu akses Pkl. 09.00-13.00.

erwin2h@gmail.com (not shared) [Switch account](#)

* Required

Masukkan Kode Token Anda: *

Your answer

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Google Forms

Pilih Salah Satu Calon Ketua RW 23 Pilihan Anda.

Pemilihan Ketua RW 23. Minggu 19 Desember 2021. *

SURAT SUARA

Pemilihan Ketua RW 23 Periode 2022-2027
Perumahan Permata Biru
Desa Cinunuk Kecamatan Cileunyi Kab. Bandung

Pilih salah satu calon pilihan anda pada media dibawah Foto

<p>1</p> <p>Dede, S.Ag., M.Pd.I (Dede)</p>	<p>2</p> <p>H. Herwan Budiah, S.H., M.H. (Budi Pale)</p>	<p>3</p> <p>Rusdiana (Rusdi)</p>
No. 1	No. 2	No. 3

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Google Forms

Figure 8: Display of the E-Voting application made with Google Form.

can also be accessed via the link provided and distributed by the committee to the community of RW 23 to jointly view and monitor the results of voting through online elections.

In the committee's secretariat room, internet access, computers along with projectors and screens are provided (shown in Figure 10) so that the results can be seen by the people who are present. Figure 11 shows the vote acquisition through online voting.

Because some people vote conventionally, the committee confirmed the rule that voting ends at Pkl. 12.00. The committee held the Zuhur prayer, rest, and lunch. pkl.



Figure 9: Election card for conventional voting.



Figure 10: Committee secretariat with projector to display online results and conventional ballot collection.

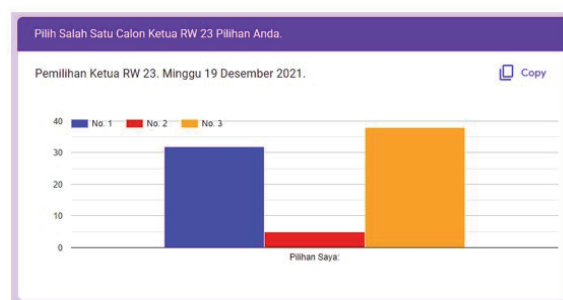


Figure 11: Display of voting results online through the e-voting application.

13.00 votes are counted for conventional elections. Figure 12 shows the vote counting process by the committee.



Figure 12: Conventional vote counting process by the committee attended by witnesses and the community RW 23.

After the vote counting process is complete, the committee announces the results of the conventional vote count combined with the number of votes cast online. Furthermore, the committee poured the total vote count results into the official report of the voting results and determined the elected Chairperson of RW 23 for the 2022-2027 period. Figure 13 shows the committee taking a group photo after reading the minutes of the determination of the voting results and determining the elected Chair of RW 23, as well as marking that the task of the committee to carry out the election of the chairman of RW 23 has been completed.



Figure 13: The committee takes a group photo after the determination of the voting results.

4. Election of Head of RT 01 to RT 10

The election of the chairman of RT 01-10 was held after the new chairman of RW 23 was elected. The mechanism for selecting the RT chairman is carried out in collaboration with the RT management who are still in office. In general, each RT conducts elections through deliberation and consensus. However, there are also some RTs that carry out elections through conventional voting, because they are deemed not technologically ready for the implementation of online voting.

5. Handover of the position of Head of RW 23

After all the steps and processes for the election of the chairman of RW 23 are completed, the committee then submits the minutes of the determination of the voting results as a report to the Chairman of RW 23 who is still in office to be forwarded to the Head of the Cinunuk Village Administration. The next process is the making of a decree for the position of the head of RW 23 by the Cinunuk Village Government, and the handover of positions is attended by the Village Head. Figure 14 shows the handover procession for the position of RW 23 Chair for the 2022-2027 period, which is located at the RW 23 Management Office.

6. CONCLUSION

The online election of the head of the RT/RW at Permata Biru Housing, Cinunuk Village, Cileunyi District, Bandung Regency, has gone well and smoothly. Through the development of technology, the implementation of online elections can be realized. However, the readiness of technology must also be balanced with the readiness of the community to use the technology. It is evident that some people in RW 23 have not been able to use technology so they have chosen to channel their voting rights through conventional voting methods. However, in general, we can conclude that the implementation of the election or voting through the online method, is easier to implement, more effective for the busyness of the committee, saves more costs, and the implementation is completed faster.

As a suggestion for other Community Service Teams who will use the online election method, in order to provide understanding in advance to the community. Based on our experience, people who refuse to use the online method generally do not understand and are worried that voting will be dishonest and not confidential.



Figure 14: The handover of the position of the Head of RW 23 attended by the Village Head of Cinunuk.

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