The Implementation of E-voting in Latin America:
The Experience of Salta, Argentina
from a Practitioner´s Perspective

Guillermo Lopez Mirau, Teresa Ovejero, Julia Pomares

CIPPEC Foundation
Callao 25, 1,
1425 Buenos Aires, Argentina
jpomares@cippec.org

Abstract. The most important implementation of e-voting in Argentina so far took place in the province of Salta, in the north of the country on the border with Bolivia. With an electoral roll of 850,000 voters that is ethnically diverse and a complex electoral geography due to a high percentage of mountainous area, its implementation is very valuable for a comparative analysis. The gradual implementation allowed for a systematic assessment, conducted by a large survey of voters and poll workers, who had used both voting methods (the traditional one and the new voting system). This paper presents this case study, emphasizing the goals pursued by this reform as well as some findings from this large undertaking. It concludes by documenting the lessons learned and examining the challenges ahead.

1   Introduction

Argentina is a federal country with a decentralized election administration system. Each of the 24 districts of the country (provinces) has the power to issue its own electoral system, from its institutions of election administration to the design of electoral rules. Since the enactment of universal suffrage, voting procedures have taken the form of the French ballot and envelope system. In national elections, each political party has its own paper ballot and is responsible for the printing and distribution of the ballots on Election Day. In the last three national elections, this voting procedure was heavily criticized. The main reason, among others, is that the high fragmentation of the party system makes it very difficult to ensure that all political parties have their electoral supply in each polling place. A system originally designed for a two-party system has had problems adapting to the current political system. Therefore, several provinces began to make changes to the voting procedures in provincial elections. Beginning in 2003, different experiences with electronic voting took place across the country as well as the use of a single-ballot system (having all election options on only one paper).

The most important e-voting experience to have been implemented in Argentina took place in the province of Salta, in the country's North on the border with Bolivia. It has approximately 1,200,000 inhabitants and has an electoral roll of 850,000 voters. Its electoral administration becomes complex because it has a high percentage of mountainous area. Some of the locations, currently only accessible by mule, still do not have basic services like electricity. In addition, Salta is one of the few Argentine provinces that has a lot of ethnic diversity: 10% are descendants of native peoples. Picture 1 shows an indigenous woman casting her vote, and picture 2 shows the village of Nazareno in the province of Salta, the first place where e-voting was tested.

Picture 1: an indigenous woman casting his vote in Nazareno, Salta, 09/08/2010
Picture 2: view over Nazareno, Salta, 09/08/2010

The e-voting implementation in the province of Salta began in 2009 and will conclude in 2013 once the system has been expanded to 100% of its electoral roll. It has important implications for the rest of Argentina and the region. The gradual implementation has allowed a systematic evaluation of the impact of changing voting procedures on voters and the political parties. Currently, several provincial legislatures are examining the possibility of reform projects to change voting procedures and the experience in Salta provides systematic evidence to this debate.

This paper aims to present this experience, emphasizing the goals of the reform as well as some findings from an evaluation carried out by the Government of Salta, the Electoral Court, and the Center for the Implementation of Public Policies Promoting

Equity and Growth (CIPPEC), a think tank based in the city of Buenos Aires. First, this paper describes the characteristics of the implementation of electronic voting in Salta. It describes the context in which it has been deployed and system characteristics (section 2). Section 3 identifies the objectives sought by the provincial executive by implementing this e-voting system. Section 4 presents some conclusions of the evaluation, and section 5 concludes, emphasizing the lessons learned and challenges ahead.

2   Characteristics of the Implementation of E-voting in Salta, Argentina

In 2004, the Electoral Court of the province of Salta[1] started to evaluate the possibility of incorporating new information and communication technologies into the electoral process. When the government of Salta decided to implement new technologies into the electoral process, it sent a bill to the legislature to amend the provincial electoral system. The law was passed in late 2008 with very general provisions, giving the Provincial Electoral Court the authority to approve and control the electronic voting system and to ensure that the technical information was passed on to all political parties. The legislation does not provide specific regulations on how to audit the e-voting system.

The electronic voting system chosen by the province[2] is provided by a private company in Argentina and has a fundamental characteristic: the information is stored on the ballot and not inside the voting machine. In fact, it is a machine which allows the voter to create, in the actual sense, her vote. The design of the ballot has a similar design to the traditional paper ballot but also incorporates a chip which electronically records the will of the voter. This system maintains the use of the ballot paper and the ballot box but adds technology to the process of voting and tallying.

The following explains the steps needed to cast a vote with the voting machine: First, the voter shows up to the poll authorities and hands them her ID. Then, the authority verifies the data on the roll. Assuring she is eligible to vote, the poll authority provides the voter with an e-ballot and invites her to approach to one of the voting machines. The voter inserts the ballot into the printer's slot of the machine. Using the touch screen, she chooses the parties or candidates by simply touching the appropriate field. The system allows voters to either cast a straight ticket or a vote for a different party in each race. When finished, the display provides a summary of the ballot. The voter must "confirm" or "go back" as desired. If confirmed, the choice made by the voter is printed on the ballot as well as recorded in digital form onto the incorporated RFID-chip. To verify that the printed information is the same as the information on the chip, the voter places the ballot with the printed side up on the verifier. The information recorded on the chip appears on the screen and is identical to the printed information on the paper. Finally, the

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[1]   According to the constitution of the province, this body is empowered to arrange the organization and functioning of the election.
[2]   The legislation does not specify a type of election system that has to be used. It was defined by the executive of the province in accordance with the Provincial Electoral Court.

voter must fold the ballot (with the vote inward), go back to the table, put the ballot into the ballot box, and collect the signed and sealed document of identification from the polling authorities. Pictures 3 through 5 show the voting machine and the e-ballot.

Picture 3: Voting Machine

Picture 4: an elector inserts her ballot paper in the voting machine

Picture 5: printed ballot paper close to the verifier

Once the election is closed, the tallying of the votes begins (provisional tally of results). The functionality of the machine is changed from "voting machine" to "tally machine". To do this, the poll authority has an identification card, with an RFID chip, that enables the system by holding it close to the verifier of the machine. In the menu, she chooses "Close Election and Tally Results". The next step is to open the ballot box and one by one, take the votes and pass them through the reader of the machine. The system shows, visibly on the screen and by making a sound, the advance of the reading process and of the sum of the votes. If the ballot is read correctly, one hears a "beep" specific to that condition and "Reading OK" appears on the screen. Scanning a vote more than once, causes the message "repeated vote" to appear, and the vote is discarded. If the electronic ballot (BUE) could not be read, the display indicates this circumstance and discards it. This BUE will be classified in the category of "provisional ballot" and later, during the final counting process, the electoral court will decide its validity.

Having read the last vote, the results of that voting table are displayed. Pressing "Finish Scrutiny" the system asks the poll authority to enter the number of "provisional ballots". Those figures, together with the results, will be printed on the closing minutes and on the certificate of transmission. This certificate transmits the results of this table to the computer center.

The introduction of the system began shortly after the enactment of the law in 2008, which allowed the gradual implementation of an electronic voting system. Partial implementations took place in 2009 and 2011, both in general elections and in the open primary process established by provincial legislation. The first experience with electronic voting in the province of Salta was during the elections of 2009. In both elections, the open and simultaneous primary elections that took place on July 12, 2009, as well as in the general elections of September 27 of that year, a pilot test was conducted using the system described above. The test was binding and was conducted in both elections in a town near the provincial capital (San Lorenzo), with 9200 voters. In the general election, 11 voting tables (4191 voters) in the capital of Salta also used the electronic ballot system.

During this pilot test, a survey was taken with a sample of 410 voters. The results showed some preliminary positive perceptions of the system and provided guidelines for the dissemination of e-voting in further elections. According to the survey, the voters found the system easy to use: 36% said it was easy and 57% said it was very easy to vote, while the negative opinions did not exceed 7%. The study also showed positive opinions regarding the confidence in the new system. 7 out of 10 respondents said they could rely on the new system more so than the previous system.

As a consequence of the satisfactory performance in the 2009 elections, in the general election on April 10, 2011, 33% of the registered voters in the province of Salta could vote with the electronic ballot voting system. The election was carried out in 50% of the electorate of the municipality of Salta, and all the municipalities of San Lorenzo, La Caldera, San Ramon de la Nueva Oran, San Jose, Metán and Cafayate. In total, 244,702 voters were able to vote with the electronic ballot voting system (distributed throughout 79 polling stations). The next section delves into why this voting system was introduced.

3   The Goals Pursued by the Reform

According to the executive decree specifying the required characteristics and conditions of the e-voting system, the reform introduced by the government had several objectives. Here we emphasize the objectives that are more valuable for a comparative analysis of this experience. First, the reform aimed to increase the voter's confidence in the voting system. Second, the introduction of e-voting sought to increase the speed of the vote count. In contested elections, a long process of tally of results can create uncertainty and mistrust, especially among political parties. Third, the voting procedure chosen was designed to give the voter the possibility to easily vote in individual races or by party. As mentioned above, in the national voting system the voter needs to use scissors to cut out the various paper ballots of different parties in order to vote for a different candidate in every race. In other words, the default option is a straight ticket vote. The e-voting system made the preference for a candidate rather than for a political party easier than the traditional method, although it maintained an option of straight ticket vote. A thorough assessment of the achievement of these three goals would require a longer timeframe but there is some preliminary evidence concerning the performance of the new voting system at the 2011 elections that supports the conclusions that the implementation might have achieved the aforementioned goals. The next section presents the preliminary evaluation of the new system's impact on the confidence in the election process. In the remainder of this section we provide some evidence on the performance of the new system with regard to the other two issues: increasing the speed of vote count and allowing for a split ticket vote.

The second objective, to speed up the vote tallying procedures is also associated with trust in the election process. In the context of volatile perceptions of trust in election processes and contested electoral results, delays in obtaining the results could produce social uncertainty and affect the legitimacy of the election process. E-voting mitigates this by increasing the celerity of the vote-counting process. This goal was clearly achieved in the 2011 elections when one-third of voters used the electronic voting system and two-thirds voted manually. The electronic voting system marked a drastic improvement in the speed of the counting process, the preparation of the minutes, and the scrutiny in general. During the first two and a half hours after the official closing of the polls (6 pm), the results received were almost only those from the precincts that had used the electronic voting system (see Figure 1 below).
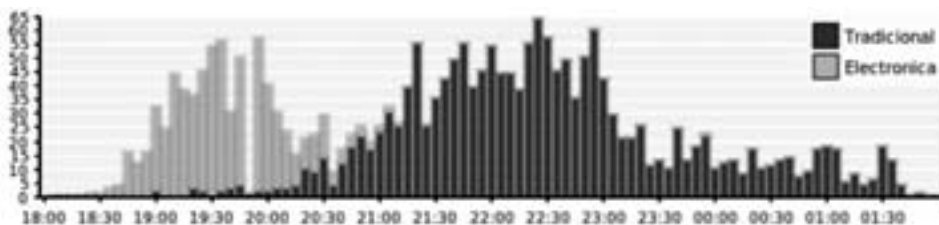
Fig. 1: Histogram of Number of polling tables' tally of votes received by the Electoral Tribunal by type of voting system, source: Electoral Court of the province of Salta

A third important aspect of the implementation of e-voting devised by the provincial executive government has to do with allowing a split-ticket vote. In the context of a highly fragmented party system [CE05], there is anecdotal evidence that voters have become more independent and less partisan in their electoral choices over the last decade. Against this backdrop, the e-ballot system implemented in Salta plays a key role in facilitating a split-ticket vote. As mentioned above, the voter has the option of voting for the entire list of candidates of only one party or voting for a different candidate in each race by touching the screen. In contrast, in the case of a traditional paper ballot system, the elector has to cut various paper ballots to mix his choice of candidates, which can be confusing and, if not done correctly, could nullify the vote.

According to the survey, the percentage of split-ticket voting is significantly higher among e-voters in comparison to traditional voters in the 2011 elections. While approximately 50% of voters using the electronic voting system said they split their ticket, in the traditional voting system only about 25% said they voted for different parties in each race. As expected, the individual votes per race were mainly cast by younger voters.

Voters were also asked whether they preferred cutting out the traditional paper ballot by hand or splitting the ticket electronically. The question aimed to determine the degree of discomfort that may cause a voter to vote using the traditional system. Almost 8 out of 10 voters who used the new voting system preferred to split the vote electronically. Even a majority of voters of the traditional system indicated their preference for the electronic system to split a ticket (49.9%) while 43.4% preferred to cut out their votes manually.

These figures might indicate that the chosen system makes a split ticket easier. Although this finding may provide evidence that one of the goals of the reform was accomplished, this fact should not be equated to an increase in the quality of the party system. The case could be made that this voting technology could only reinforce party system fragmentation trends. Further analysis is required on this issue.
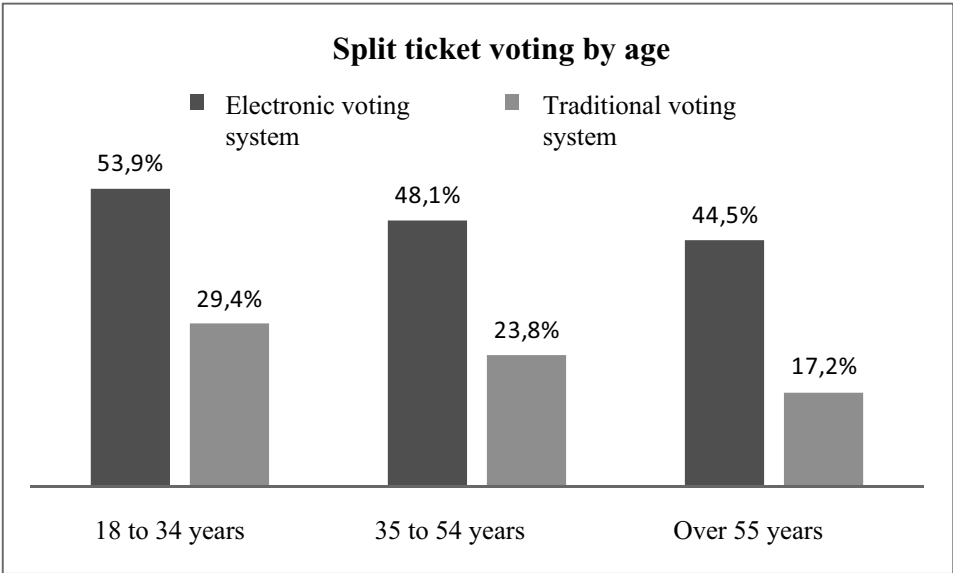
Split ticket voting by age

Electronic voting system ■   Traditional voting system ■

53,9%

48,1%

44,5%

29,4%

23,8%

17,2%

18 to 34 years   35 to 54 years   Over 55 years

Fig. 2:   Percentage of split-ticket voters using and their voting methods, broken down by age "Which voting method of voting did you use in today´s election?", Source: survey of 1502 voters

Preferred voting method for a split ticket vote

Electronic voting system ■   Traditional voting system ■

78,7%

49,9%

43,4%

15,0%

3,3% 1,3%

3,0% 5,4%

No answer   Cutting manually   Choose candidates   I don´t know
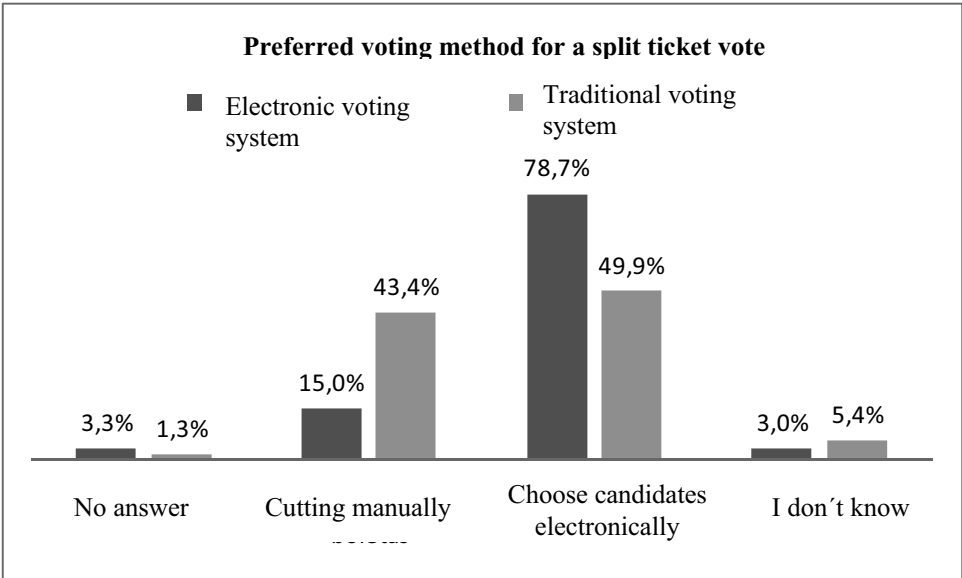   electronically

Fig. 3:   Preferred method for voting a split ticket. "If you wish to vote for candidates of different parties, which voting method do you prefer?
Source: survey of 1502 voters

4   Some Findings from the 2011 Evaluation

During the election of 2011, together with the think tank CIPPEC, a major effort was made to evaluate the implementation of electronic voting in Salta. The partial implementation of the new system in the province of Salta provided a unique opportunity to carry out a systematic and rigorous comparison of the e-voting system with the paper ballot voting system (hereafter the "traditional" method). To gage the level of support and overall satisfaction with the new voting procedure among voters, poll workers, and political parties, a research team employed quantitative techniques (a survey of perceptions and opinions of voters and poll workers) and qualitative techniques (participant observation and interviews with election officials and leaders of political parties).

On election day, a total of 1,502 voters and 112 poll workers were questioned about their perceptions and opinions of both types of electoral systems; both, in voting sites using the traditional system and in voting sites using the e-voting ballots. Also, 18 leaders from 13 provincial political parties and electoral alliances were surveyed. The evaluation covered a large range of questions and issues but two aspects are discussed here in detail[3]. We analyze the impact the new system had on overall support and on the confidence of voters and political parties. Also, we mention some perceptions of political parties' leaders on the consequences of changing voting procedures over their strategies in electoral campaigns.

As indicated by the surveys, the vast majority of voters and the poll workers that used the electronic system, preferred the new system rather than returning to the previous system. Most people using the traditional system (even though it was a smaller majority) would have preferred the electronic alternative. Therefore, the replacement of the traditional voting procedure has full the support of voters who tested the electronic voting as well as of those who voted with the traditional system.

An important component of the evaluation has to do with the impact of the new voting procedure on confidence in the election. There are several definitions of this component. For the purposes of this paper, our starting point is the view presented by Giddens, who analyzes trust in his study of the consequences of modernity [Gi90]. He differentiates between trust and confidence by arguing that trust is a specific type of confidence mediated by faith and, hence, by contingency. He defines trust as 'confidence in the reliability of a person or system, regarding a given set of outcomes or events, where that confidence expresses a faith in the probity or love of another, or in the *correctness* of abstract principles (technical knowledge)' [Gi90, p. 34, emphasis added]. Abstract systems engaged in election processes need to guarantee that their correctness is *fair*. Trust in the election process entails trust in the *impartiality* of state institutions.

Beyond the broad concept of confidence, there is a need to break it down into different components [Po11a]. We focus on two different aspects: the perceptions that the vote is properly stored and counted and the confidence in protecting the secrecy of the vote. The first aspect is related to the system's ability to correctly translate the expression of the voters' will and the second is related to the secrecy of her choice. Different questions

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[3]   For a thorough analysis of the findings of the study, we refer to [Po11b] and [AL12].

were asked for each voting system. Voters who used the electronic voting system were asked how secure they felt that their vote was correctly registered. The voters using the traditional system of counting were asked how secure they feel that their vote had been correctly counted.

It was found that both voting systems are perceived as reliable and safe: 6 out of 10 voters in both systems were sure that their vote was counted correctly (see Figure 4 below). 83.1% of voters that used electronic voting reported feeling "confident" or "very confident" that their vote was registered correctly. A statistical analysis carried out using a matching method showed that the impact of this technology clearly increases this dimension of the confidence of the voter [AL12].
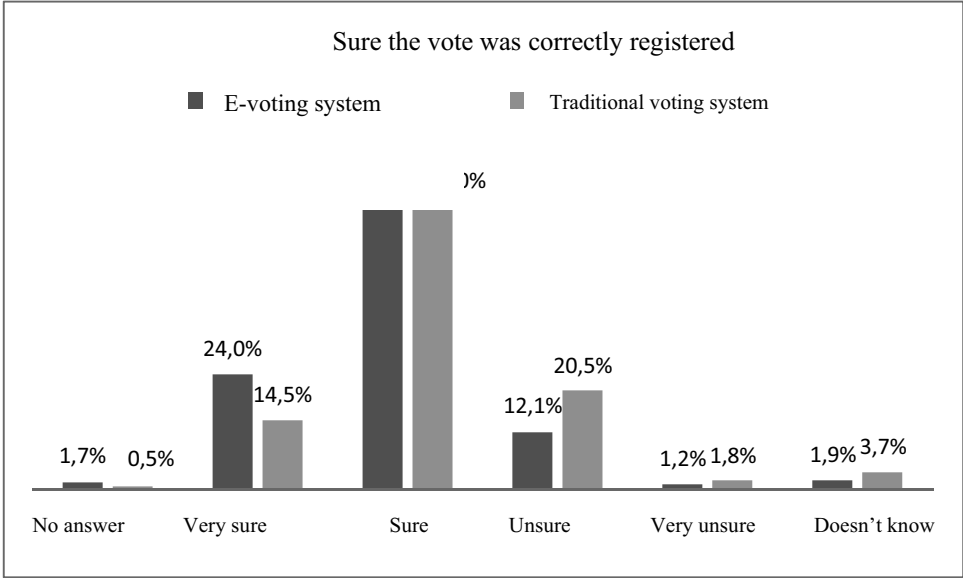

Fig. 4: Answers to questions "Are you sure your vote was correctly registered?
By voting system, Source: survey to 1502 voters

The confidence in the secrecy of the vote was found to be high in both systems, although slightly higher among voters using the traditional method. While 74% of the e-ballot voters said they were "confident" or "very confident" that their vote was secret, among the traditional voters the figure was 83%. The statistical analysis confirms the small but negative influence of the new technology on the confidence in the secrecy of the vote. It is not easy to draw conclusions about the reasons behind this impact. It may be due to the particularities of traditional voting in Argentina. The ballot and envelope system used in Argentina implies that the voter enters a closed room alone where she casts her vote without being observed or making eye contact with others. By contrast, the electronic voting system (like any e-voting system) is operated at a short distance from the table and the voter can see and be seen from behind the voting booth.

Empirical investigations into the sources of confidence in elections are conducted almost exclusively from the perspective of voters rather than that of political parties, even though, if 'the dynamics of politics is in the hands of losers,' as Riker [Ri83] puts it, it is at first place in the hands of political elites [EMR08]. Since the voting system must be reliable both for voters and for political parties, the evaluation also captured the perceptions of political party members. Interviews with leaders and members of political parties show that an important element of trust in the new system is that the chosen system maintains the paper ballots and the ballot box. Party members supported the new voting system although their leaders expressed some concerns. These concerns are mainly due to the fact that the new system seems to defy the ability of parties to adapt the control routines of elections which they had developed for the previous method. Also, according to interviews with party members, the absence of audit mechanisms in the normative framework is perceived as a weakness of the reform.

5   Conclusion: Policy Lessons from the Salta Experience

This paper aimed to present the experience of e-voting in Salta, Argentina. It is the most important e-voting experience implemented in Argentina so far and the gradual implementation of the e-voting system allowed for a systematic evaluation of the perceptions of voters and poll workers about the new voting system. The voters' survey shows that the electronic voting system is supported by most voters and poll workers and there is an overall consensus about the support for a change. The e-voting system also increases confidence in the ability of a correct translation of the electoral will into a vote. Voters are also confident in the secrecy of the electronic vote. However, this dimension of trust, the traditional method of voting performed better than the electronic voting system. This might be transitional, but it also points to the importance of training and communication efforts. Due to the fact that the gradual implementation at 2011 elections focused on polling precincts with better telecommunications infrastructure, the proportion of highly-educated voters was higher than the provincial average. Therefore voters training and communication strategy should be further enhanced in the total rollout for the 2013 elections.

The evaluation also shows that the e-voting system facilitates split-ticket voting, giving greater prominence to the candidate over the political party. The voting procedure seems to reinforce a pre-existing trend and there is a challenge ahead that has to do with analyzing whether the new system would further fragment the party system and its cohesion. Finally, the experience of Salta confirms the advantages of a gradual approach to the roll-out, which allowed for adjustments to be made throughout the process and resulted in a better implementation of a new voting procedure.

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