World Health Organization

SEVENTY-FOURTH WORLD HEALTH ASSEMBLY **A74/24 Add.1**
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Election of the Director-General of the World Health Organization

Use of optical scanners

Report by the Secretariat

1. In February 2020, at its 146th session, the Executive Board requested the Director-General to research and evaluate, in advance of its 147th session, options for counting votes by means of an optical scanner.[1] At its 147th session, the Board considered information concerning voting machines able to read votes cast on ballot papers and tabulate them immediately.[2] That discussion was inconclusive. At its 148th session, the Board decided to request the Secretariat to conduct a study on voting machines able to read and immediately tabulate votes cast on ballot papers, and to report on its findings to the Seventy-fourth World Health Assembly, through the Programme, Budget and Administration Committee of the Executive Board.[3]

2. In view of the specialized nature of the study, the Secretariat commissioned external experts in e-Government and electronic voting to conduct it. The study considered the voting process for the election of the Director-General, identified scenarios and options for the use of voting technologies, and analysed the costs and benefits of each option.

VOTING PROCESS

3. The voting process for the election of the Director-General potentially consists of several rounds of secret ballot votes and takes place in the plenary hall of the World Health Assembly. Each round lasts 60–90 minutes and consists of three steps, described below.

(a) **Distribution of ballot papers.** Each Member State entitled and wishing to vote casts one vote in each of the rounds. Delegations from Member States designate a representative who will cast the vote. When voting starts, delegates, when called, will proceed to their designated voting station and receive a blank ballot paper.

(b) **Collection of ballot papers.** The ballot paper consists of up to three voting options for the first round of voting, and no more than two voting options for all successive rounds. When voting,

[1] See decision EB146(22) (2020).

[2] See document EB147/4 Add.2; see also document EB147/2020/REC/1, summary records of first meeting of resumed session, section 4.

[3] See decision EB148(11) (2021).

the delegate selects a candidate by marking the appropriate box. It is possible to abstain. The delegate is expected to complete the ballot paper in private and cast it into the ballot box.

(c) **Counting and tabulation.** Once all Member States entitled to vote and wishing to do so have voted, the ballot box(es) is/are carried from the voting station(s) to the central stage where counting takes place. Once the tabulation is complete, the result is announced, and either a candidate is appointed as the Director-General, or a subsequent round of voting is called.

4. The distribution of ballot papers, collection of ballot papers and counting of the votes are the three most time-intensive stages of paper-based voting in WHO governing bodies. Effective measures to save time during the distribution and collection of ballot papers were introduced at the last election of a Director-General in 2017. The main intention of using optical scanners would be to reduce the time taken to count the votes.

AUDITING CONSIDERATIONS

5. Auditing is an important consideration and an integral part of the process to verify the accuracy of the result. In the case of manual vote counting, the tellers, who are Member State representatives appointed by the President of the World Health Assembly, count the votes and oversee the regularity of the voting process. When technical solutions are used for counting, it is necessary to audit the results against the ballots to verify and maintain confidence in the accuracy of the count. This can be done through a secondary inspection of the vote using one of the following methods:

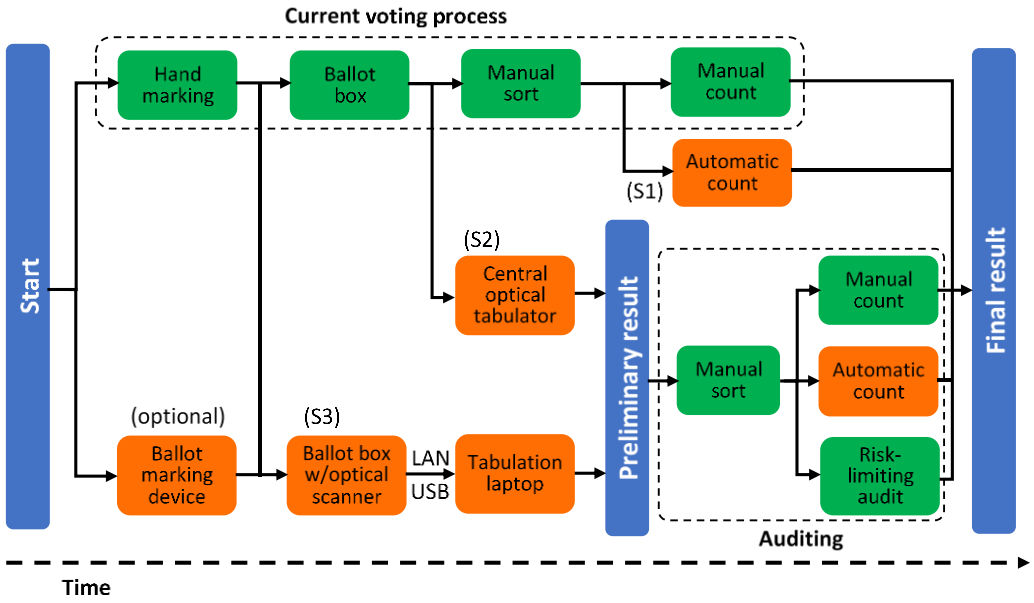
(a) **Full hand count.** In this scenario, the tellers would manually sort and count the vote to verify the results. Clearly, this would negate any time saving gained through the use of counting technology.

(b) **Risk-limiting audit.** In this scenario, the tellers would manually count a sample of the ballots to construct statistical evidence in support of the election result. This method is particularly efficient in the case of large margins among candidates. In the worst case, however, a risk-limiting audit may trigger a full hand count if statistical evidence cannot be constructed. Furthermore, setting up these audits requires organizational overheads and time. This method is therefore not expected to bring any advantage in the context of the election of the Director-General.

SCENARIOS

6. Based on the voting process for the election of the Director-General, and available technologies that support the counting of votes, three scenarios for the automation of vote counting have been identified. These are summarized below in the figure, starting with the current voting process and introducing three ways in which voting could be supported by automatization techniques, scenarios (S1), (S2), and (S3), and an option to support the marking of ballots. The figure also indicates the time required for the process – the more steps involved, the more time the process requires. Steps marked in blue indicate an input/output of the process, in green are those that require human interaction, and in orange are those that make use of election technology.

Fig. The different scenarios considered for voting and counting



I. Automated counting

7. In this scenario, the distribution, collection and sorting of ballots remain unchanged. After the ballots are sorted, they are counted using automated ballot counters, which count the ballots and display the result, similar to a counting machine for bank notes. They can reduce clerical errors during the manual count of the paper ballots, while the functioning of the technology can be observed and audited by any of the participants.

8. Machines for automated counting of paper stacks are widely used. These devices are therefore available off-the-shelf at relatively low costs. If these machines are used, two will be required in case of malfunction. The total cost of this option is estimated at US$ 10 000.

9. It is expected that the automated counting of ballots would halve the time required for the counting process. Given that counting also includes ballot sorting, the time savings are expected to be no more than one tenth of the overall process, in other words five to ten minutes per round.

10. With the use of automated ballot counters, an audit is not foreseen given the simplicity of the automation, which can be easily verified by those participating. Nonetheless, compared to manual counting, there is still some risk of malfunction, cyberattack, or misconfiguration (resetting the counters).

II. Central optical tabulator

11. In this scenario, the distribution and collection of ballots remain unchanged, but customized, machine-readable ballots would be needed. After the opening of the ballot boxes, ballots are inserted, scanned and tabulated by a centralized optical tabulator system, which then displays the preliminary result of the election. An audit is mandatory prior to the declaration of the verified results.

12. Central optical tabulators are highly complex machines designed for a large volume of ballots. They are therefore very costly. Given their complexity, there will be additional costs for customization and operation. The total cost of this option is estimated at US$ 130 000–200 000.

13. While the use of a central optical tabulator would reduce the time required to obtain preliminary results, the mandatory audit required to verify those results will negate the savings.

III. Ballot box with optical scanner

14. In this scenario, only the distribution of ballots remains unchanged but customized, machine-readable ballots would be needed. After receiving the ballot, the voter marks the ballot by hand, and inserts it into an optical scanner, instead of a ballot box, placed in the voting station. The optical scanner scans the ballot and stores its digital interpretation in memory. When each voting round is completed, this information is then transferred to a central tabulation computer, either by local area network or via a USB memory stick, for the computation of preliminary results. An audit is mandatory prior to the declaration of the verified results.

15. Ballot boxes with integrated optical scanners are simpler than central optical tabulators. They also tend to be manufactured in large quantities for use in country-wide elections, and therefore have a relatively low unit cost. However, machines will be needed for each of the six voting stations, plus a spare one in the event of a malfunction. Furthermore, the machines will have to be customized. The total cost of this option is estimated at US$ 46 000–82 000.

16. While the use of ballot boxes with integrated optical scanners would reduce the time required to obtain preliminary results, the mandatory audit required to verify those results would negate the savings.

Equipment rental

17. As the technology is only needed for limited use, renting is an option. This could reduce the overall costs but may increase handling costs. The cost of renting of voting equipment, such as central optical tabulators or optical scanners, is likely to be high, owing to their limited reuse possibilities, and is estimated at around 80% of the purchase cost. Rental does not avoid the need for external security validation. The resulting cost estimates for equipment rental are:

- automated ballot counter: US$ 10 000
- central optical tabulator: US$ 110 000–170 000
- optical scanner with integrated ballot box: US$ 50 000–90 000

CONCLUSION

18. The study concluded that the use of optical scanners for election of the Director-General does not bring sufficient time saving to outweigh the additional cost and risks incurred. Of the three scenarios, only the use of an automated counter is likely to result in a marginal reduction of time. All scenarios bring additional risks with respect to configuration and operation. It is therefore recommended that the practice of counting votes manually should continue.

ACTION BY THE HEALTH ASSEMBLY

19. The Health Assembly is invited to note this report and provide guidance on whether to pursue the use of optical scanner in votes by secret ballot.

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