INTERNATIONAL LABOUR OFFICE

GB.285/LILS/1
285th Session

Governing Body

Geneva, November 2002

Committee on Legal Issues and International Labour Standards **LILS**

FIRST ITEM ON THE AGENDA

Replacement of the electronic voting system and introduction of new information technology at the International Labour Conference

1. During the examination, at the 282nd Session (November 2001) of the Governing Body, of the consolidation of reforms to the International Labour Conference, the Office suggested that the electronic voting system of the Conference would at some point need to be replaced. [1] The Governing Body then requested the Office to present to it, at its 283rd Session (March 2002), a cost-benefit analysis of the use of information technology in the Conference. [2] The Office prepared an assessment of the expenditure and savings made in connection with the use of information technology at the Conference since the introduction, in 1993, of the electronic voting system and its further development into an integrated conference management system (CMS). [3]

2. As a result of this assessment, the Governing Body requested the Office to prepare, for its present session, detailed proposals for the replacement of the electronic voting equipment and the introduction of new information technology, as well as a timeframe for its introduction. [4]

Functioning of the current electronic voting system

3. The electronic voting system was introduced in 1993 as part of the reforms decided at the time to improve the functioning of the Conference, in particular with a view to ensuring a greater reliability of the vote count as well as significant time savings.

[1] GB.282/LILS/2/1.

[2] GB.282/8/1.

[3] GB.283/LILS/4/1.

[4] GB.283/10/1.

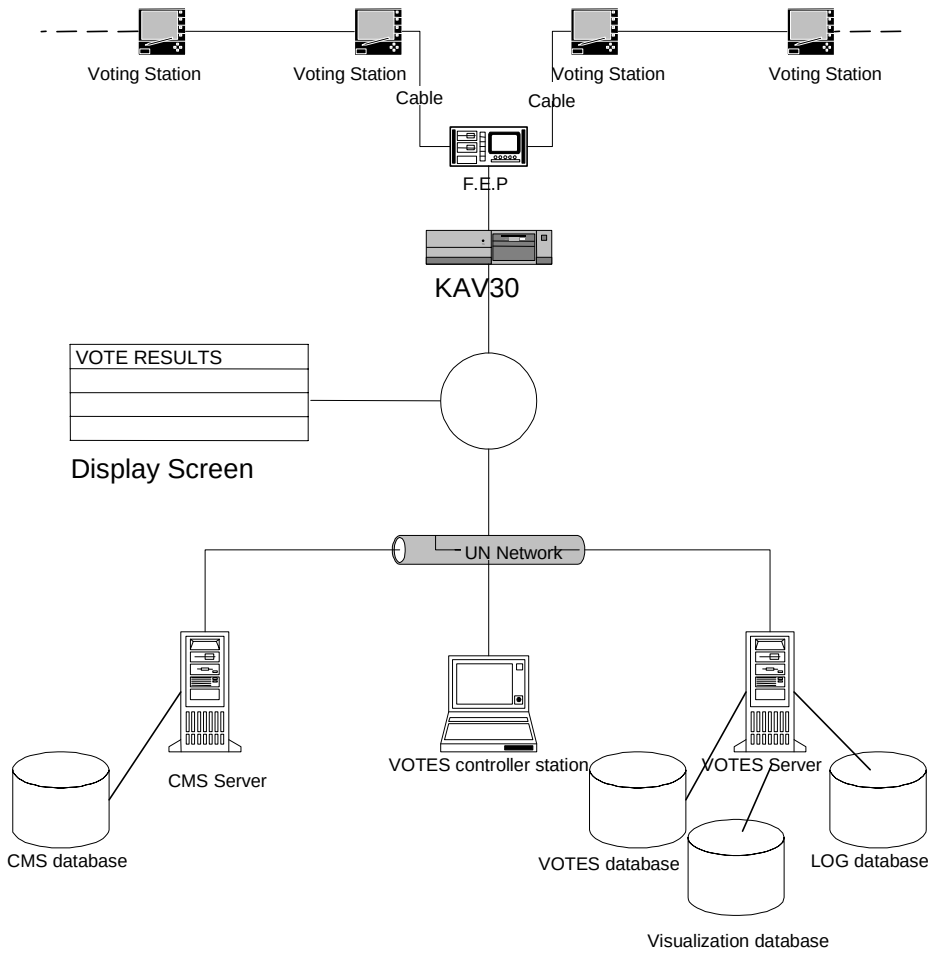
4. Due to the specificity of the Conference voting requirements (tripartite structure, identification of the voter, possibility of substitute voters, complex quorum calculation, trilingual display, election type and multiple choice votes in addition to the standard yes/no/abstention vote, etc.), the only solution available in the market meeting those requirements at the time, among proposals received in response to a competitive bidding process, was a tailor-made system, which has now been in operation for ten consecutive sessions of the Conference.

5. The system (see diagram below) consists of a KAV30 real-time central processing unit for the acquisition of votes. It is connected to a front end processor (FEP) linking the 180 or so voting stations (one for each national delegation) on an industry standard network cable, installed in the United Nations Assembly Hall at the Palais des Nations in Geneva.

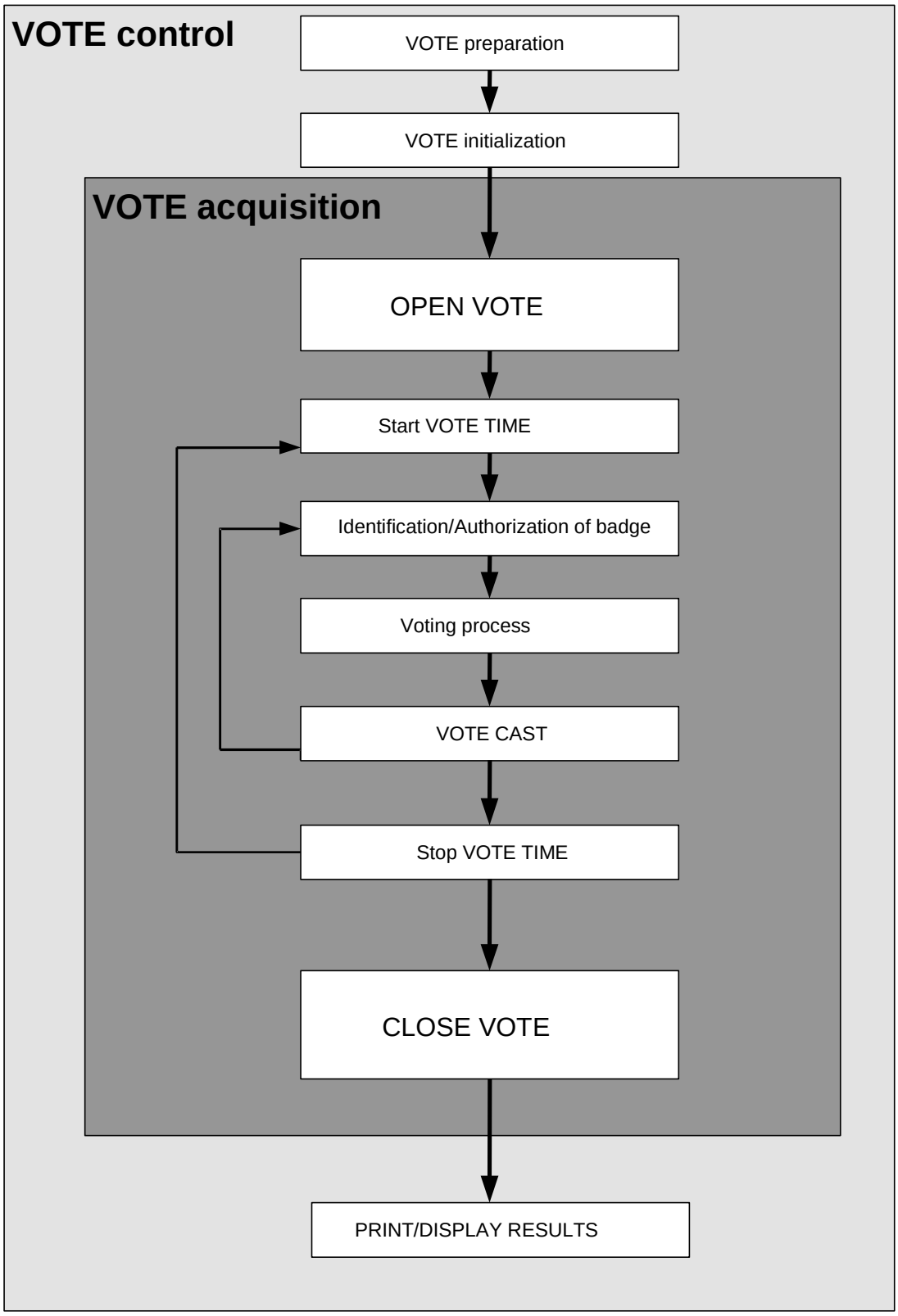
6. A VOTES server sits behind the KAV30 and collects the results of the votes in a relational database, logs the events in a LOG database, and keeps track of the physical state of the voting stations in a visualization database.

7. The VOTES server is connected physically on the network to the conference management system (CMS) from whose database it extracts the information concerning the voting community (identification information, language), the rights to vote as well as the quorum information.

8. The VOTES controller station allows the start/stop of a vote, while controlling the state of voting stations as well as the display screen during a vote. It also prints the results of the vote ready for publication in the *Provisional Record*.



9. The application logic (see diagram below) comprises the following steps:



– The **preparation of the vote** consists of creating the subject of the vote, defining its type (simple, election, multiple choice, etc.), and determining the majority to apply as well as the number of "vote times" necessary.

– The **initialization of the vote** imports the relative information from the CMS, builds the list of authorized badges, creates the list of seats, the list of potential voters and calculates the quorum and, if necessary, voting coefficients.

– When the vote controller **starts the vote**, all the necessary information prepared is transferred to the vote acquisition system, the voting stations and display screen are then set to accept the new vote.

– A **vote time** is then started, and delegates may vote. When a delegate inserts his/her badge, the magnetic strip is read and requests authentication to the server. If the badge is identified and allowed to vote, the question of the vote will appear on the voting station screen, and the delegate will enter his/her response(s) using either the yes/no/abstention keys or the numeric keypad in case of a multiple choice vote. The delegate may then cast his/her vote by a double confirmation. The badge is then tagged as having voted and may not be reused.

– When the vote controller **closes the vote**, the detailed results, or the totals only in case of a vote by show of hands or a secret ballot, are transferred from the KAV30 back to the VOTES server for analysis, print and display.

– The visualization database allows the vote controller to view the state of all voting stations during a vote, in order to be alerted in case of malfunction of a particular voting station, and to check when all activity on the voting stations has ceased.

Reasons for replacing the existing system

10. The KAV30 is no longer produced and changing just this piece of the equipment would imply a significant amount of work without any functional benefit or without impact on other possible failures. In case of failure of this piece of equipment, the only possible backup would be a manual voting procedure. The tailor-made voting stations are also slowly showing signs of wear, and the company that manufactured them no longer exists.

11. Currently, the voting system may only be used in the Assembly Hall of the Palais des Nations in Geneva, as it is cabled in that particular room. This situation means that the Office can organize the votes in this room only. Moreover, before every Conference, the whole of the cabling has to be checked and repaired, as during the course of the year, a number of meetings in this room modify the layout of the tables, which inevitably leads to cable damage. Another problem is the fact that it is very difficult to test any modification made to the system in a real environment, with as many potential voters as during a plenary session of the Conference.

12. In addition, the development environment of the current system is very specialized (real-time, industry-specific network, obsolete operating system), and is only used in this specific context, once a year. This requires ILO support personnel to maintain competencies in a very narrow domain. Moreover, external consultants acquainted with this environment are very scarce on the market, and outside support has become practically non-existent.

Identification of possible future systems

13. In view of the above difficulties, any new system should ideally use standard, common, everyday technology not linked to a specific field of specialization. By heading towards this kind of solution, not only would the Office become independent in terms of support,

but it could also enhance the functionalities of the system, integrate it into the existing CMS more easily (thus taking advantage of the ongoing investment made by the Office in developing the CMS) and extend its use to other applications within the CMS.

14. With this in mind, the Office has recently explored the various possibilities available in the market, which, unlike in 1993, now proposes various standard electronic voting equipment:

- **E-voting** is mainly aimed at national elections. Voting protocols are in the process of being defined by consortiums. Such systems are made available directly on the Internet or in polling stations. They are tailored towards citizens to take part in elections (electronic democracy), and must mainly ensure correct identification, an extremely secure environment through specific encryption mechanisms and prevent unauthorized access to detailed results. This would be incompatible with the requirements of ILO record votes, for which detailed results are necessary. From a financial point of view, in addition to the purchase of standard hardware, this solution would require the complete modification of the existing voting software as well as of all connected CMS applications.

- **Audience response systems**. These systems are used for opinion polling in a meeting. They use wireless keypads to allow members of the meeting to respond to questions displayed on a screen. These systems, however, do not have any identification of the user available.

- **Direct record electronic systems**. A number of other systems exist on the market, either running on standard PC equipment or on specific mobile hardware, with very few customization and extension possibilities.

15. In the light of this market prospect, no standard voting system appears to be customizable enough to meet the specificity of ILO voting procedures or to be integrated into other applications in the CMS. Therefore, at the end of the last biennium, a prototyping exercise was undertaken to examine the possible use of other standard technology for ILO voting needs compatible with existing applications in the CMS and with the development of further applications within the system.

Preliminary results of the prototyping exercise

16. The aim of the exercise was to validate the combination of radio networking technology with pocket standard or tablet PC hardware, using a standard web browser interface connecting to a relational database.

17. The results proved that it was technically feasible and that it would present the following advantages:

- By using a portable, wireless standard type equipment with a standard browser interface and projection screens, the system could be extended to cater for more interactive meetings in particular for dealing with amendments and subamendments in committees, to the extent where delegates themselves could type their subamendments on the portable equipment and make them available electronically to the committee secretariat for translation/projection in the room on the spot.

- The use of this kind of equipment would thus be optimized in that it could be used even simultaneously, and for different purposes, by the plenary, committees and electoral colleges and would not be dependent on a particular location. By being

integrated into the CMS, the system would also permit the identification of users for purposes other than voting (such as committee members entitled to move motions or amendments).

– As regards Governing Body elections, the present system allows the Governmental Electoral College to elect its representatives for the Governing Body by using eight multiple choice votes; the possibility of being able to run the elections as one vote would be a distinct advantage. This means, in terms of application logic, to introduce the possibility of sub-multiple choice votes. By having mobile-type equipment, it could also be split into three different rooms, thus enabling the holding of the other electoral colleges at the same time.

– If the system were to use standard hardware and software and notably a browser interface, it could be used not only from voting stations for the Conference but also for the Governing Body if needed, or from standard PC equipment in the Office. This could extend the use of the system to many elections inside the Office (Union, SHIF, Pension Fund, etc.), or even for surveys. The testing of new functionalities of the system would be made easy by having Office officials control the system from their respective workplace.

18. At the same time, the prototyping exercise has shown that if this technical option were retained, a number of practical issues should be addressed, both in terms of the preference of constituents and of the technical solutions proposed by the market.

Exact type of portable equipment

19. The technology in this area is constantly evolving but the two main streams, other than standard portable PCs, are PDAs (personal data assistants) and tablet PCs.

PDA

Tablet PC

20. The advantage of the tablet PC over the PDA is, besides a bigger screen, the possible use of a keyboard, which would be required for applications such as the management of amendments in committees, whereas during a vote, touch-screen technology could be used.

Security of equipment

21. An appropriate management system ensuring security of the equipment will be developed.

Identification of voters

22. At present, the identification of the voters is carried out using a magnetic card, which is also the visual identification badge of the Conference delegate. The use of magnetic card readers in standard portable equipment is becoming scarce and the trend is to use either smart cards or bar code information on the card.

23. However, smart cards are more expensive than magnetic strip cards and would force the Office to change the current badge printing machines. On the other hand, bar codes take up a lot of space on the badge itself, and the badge printing operation would be longer.

24. An alternative solution would be to use a pin code that would be produced automatically and given to the voter. This solution is the most economic as no specific card reader is needed in the voting station and votes can be conducted without specific identity cards (in the case of Office-wide votes, for example, pin codes could be sent to users via mail). The disadvantage is that the delegate has to keep this pin code separate from his/her badge or memorize it.

Cost estimate

25. The estimated cost of the replacement of the obsolete components of the electronic voting system by standard hardware equipment and customizable software compatible with the applications within the CMS would be of the order of US$600,000 as follows:

Hardware: server, 200 voting stations, radio connectivity:	US$370,000
Software development and implementation:	US$230,000
TOTAL:	US$600,000

26. Of course, this is an estimate that could vary depending on the type of hardware chosen and the exact detail of functionality implemented on the software side. Only a proper request for proposal could answer the exact detail and breakdown of different modules.

Implementation plan

27. Because of the risk of breakdown with the existing system and of the consequences for the Conference schedule, it would seem prudent to aim, as a first step, at replacing the electronic voting system as of the Conference in June 2003, as this would permit testing with the current system as a possible back-up. The development and introduction of further applications, in particular in committees, would require additional time, but could be implemented the ensuing year with a view to its full operation, after the appropriate testing and refinement at the June 2004 Conference, during the Maritime and General Sessions of the Conference in 2005.

28. In order for the new system to be operational next June, a request for proposals through competitive bidding should be made immediately after the Governing Body, with replies requested for the end of January, and a contract signed by February so that the selected contractor and the Office would at least have three months to implement the solution, considering the possible implications on the CMS system and its organization in case a modification is required to the way delegates are presently identified.

29. ***The LILS Committee may accordingly wish:***

(a) to endorse the basic technical choice referred to in paragraph 16 above, subject to its views on the choices referred to in paragraphs 19 to 24 above;

(b) recommend to the Governing Body, subject to the recommendations made by the Programme, Financial and Administrative Committee on the financing of this proposal, that it approves in principle the replacement of the electronic voting system and further development of information technologies in the Conference within the timeframe referred to in paragraph 28 above.

Geneva, 2 October 2002.

Point for decision: Paragraph 29.