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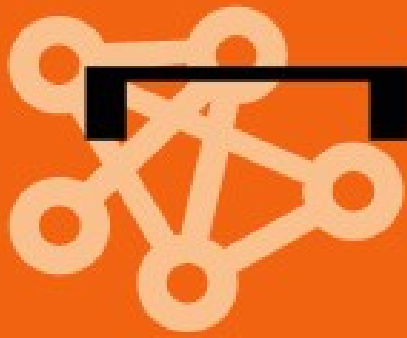
Election systems

**II CONGRESO INTERNACIONAL DE
ALFABETIZACIÓN TECNOLÓGICA- BADAJOZ 29/1
DE DICIEMBRE 2006**

**ELECTRONIC VOTING-
INTERNET VOTING
SYSTEMS:**

**NEDAP EXPERIENCE IN
EUROPE**

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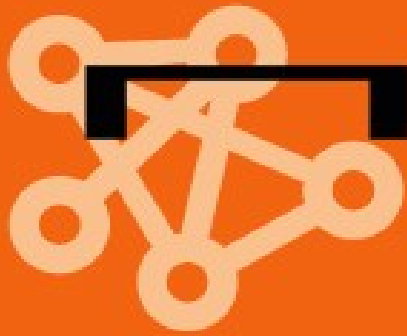


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Election systems

- Founded in **1929** in *Amsterdam*
- **600** employees
- In the election industry since **1967**





Election systems

■ Main activities:

■ **AGRI** automation, management and information systems for the diary and pig farming sectors

■ **Retail Support** anti-shoplifting systems, management and information systems for lost prevention

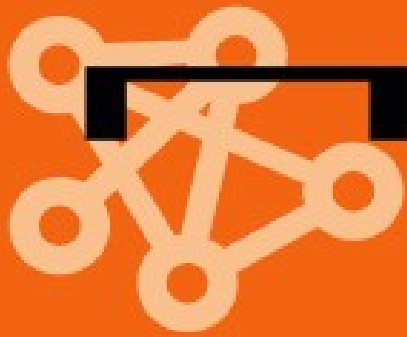
■ **Security Management** systems for access control, payment, fire and burglar alarms, observation and biometrics

■ **Election Systems** voting machines and election management and information systems

■ **Suppliers market** electronic controls

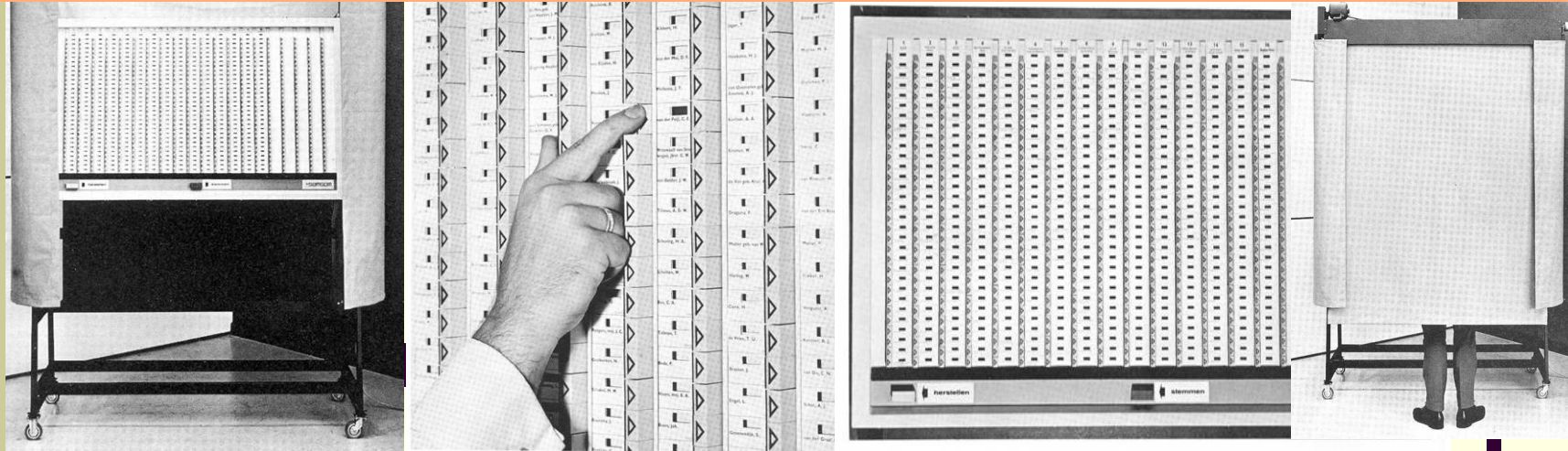
■ **Manufacturing and Assembly**

■ **Turnover 2003 : 124 Million € or 150 Million \$ US**



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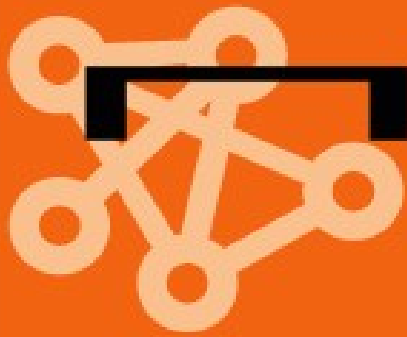
Election systems



Mechanical machine build 1969

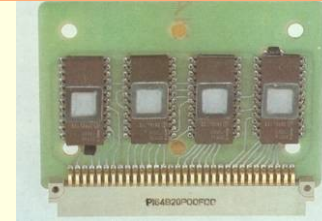
20 columns and 30 rows = 600 votable positions

1 election equals one choice, list proportional representation (Dutch elections)



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Election systems



Memory module

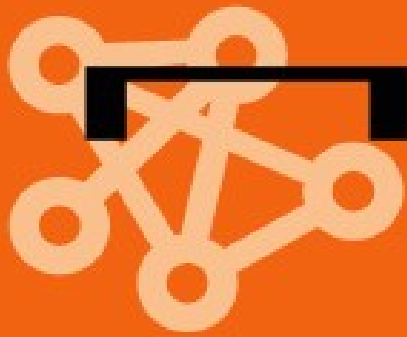


Poll worker box²⁷

First generation electronic voting machine build in 1978

25 columns and 30 rows = 750 positions

1 election equals one choice, list proportional representation (Dutch elections)



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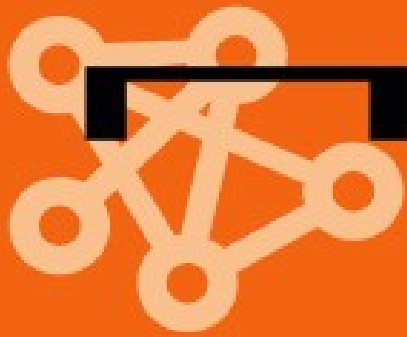
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Second generation electronic voting machine 1991

36 columns and 31 rows = 1116 votable positions

1 election equals one choice, list proportional representation (Dutch elections)



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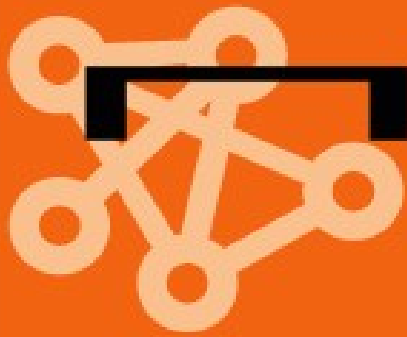
Election systems



Used in the Netherlands and pilots in France and the UK

36 columns and 31 rows = 1116 votable positions

2 elections, one choice per election, list proportional representation
(Dutch elections)

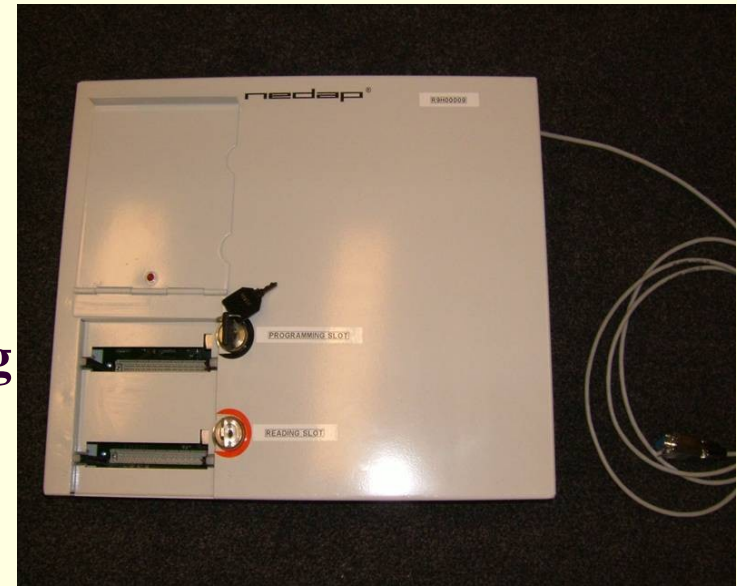


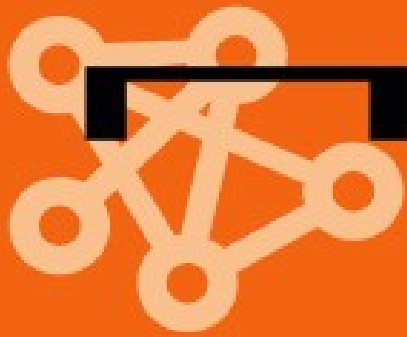
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Election systems

With the third generation machines Nedap has:

- 2. Integrated the machine with third party election management software.**
- 3. Introduced the programming reading unit PRU making central programming (configuring) and counting possible.**
- 4. Increased security by making it impossible to program (configure) modules on the machines.**



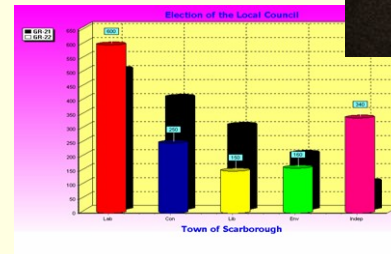
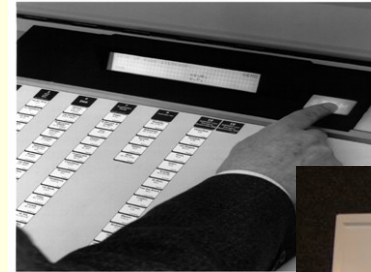


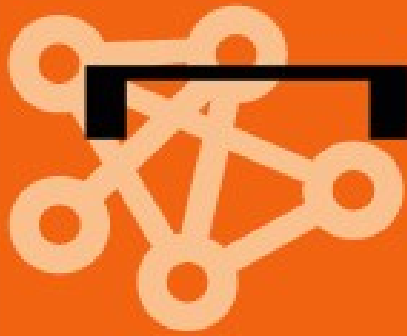
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Election systems

The Nedap Election Solution System is an integrated election system and comprises:

- **NEDAP voting machine**
- **Reading/programming unit**
- **Software modules**



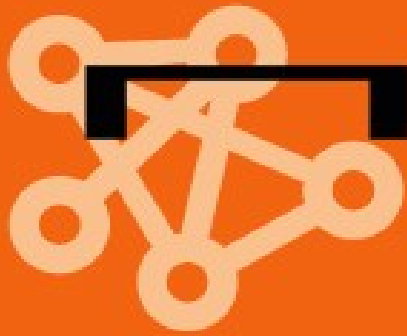


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Election systems

Supported election types by the Universal European Machine:

- **3 voter classes to vote for 1 till 3 groups of sub elections.**
- **Elections are of the type proportional representation for a party or list and or person.**
- **First past the post Elections**
- **Propositions**
- **It is possible to cast an invalid or blanc vote by means of a special button.**

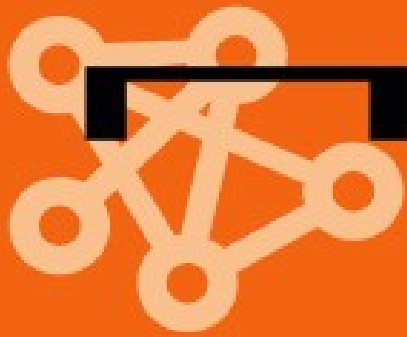


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Election systems

Supported election types by the Universal European Machine and the standard European firmware:

- **Workers union elections where voters can have rights to cast more than one ballot**
- **Weighted and distributed voting are supported 3 votes can be distributed over 1 till 3 persons.**
- **The selections made in every group of elections are voted for by actuating the cast vote button by the voter.**
- **The display on the poll worker box shows which status the machine is in.**
- **Machines support statistics for voters age groups and gender.**

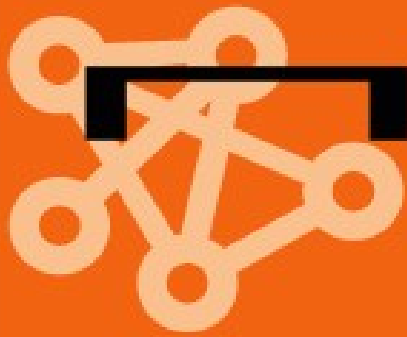


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Election systems

Voter trust & confidence:

- **All selections made by the voter are confirmed in the voter LCD display, in this way the voter can be assured the ballot paper on the machine is actually the ballot paper programmed in the machine.**
- **The order of selections and the maximum number of open selections before actuating the cast vote button are restricted in order to present full information in the voter display. In case a voter can make more selections then can be shown in the display special voter panels are constructed to give the desired information.**
- **Propriety hardware and firmware are tested by independent test authorities.**
- **The firmware is tested line by line and stored in E-proms so it cannot be changed without replacing the E-proms by opening the sealed compartment.**



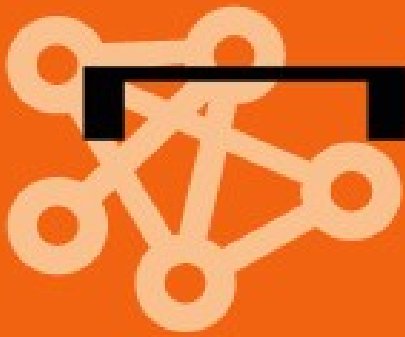
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Election systems



LIBERTY VOTE the system for the USA

The machine is the electronically equivalent of the AVM mechanical machine and requires minimum voter training
32 columns and 18 rows = 576 votable positions each with 1 LED



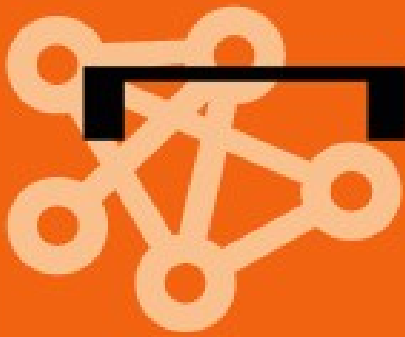
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Election systems

LIBERTY VOTE the system for the USA



1. general elections with cross and multi party endorsement
2. write in voting
3. multiple party primaries
4. Propositions
5. All ADA features are included;
 - Audio support
 - Font enlargement in the voter screen
 - Wheel chair accessible
 - 100% controllable from voter control panel



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Election systems

THE NEDAP VOTING MACHINE BOOTH



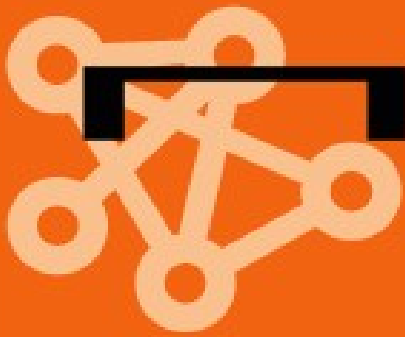
Folded for transport



Voting machine in active position



Front side facing wall to ensure voter privacy



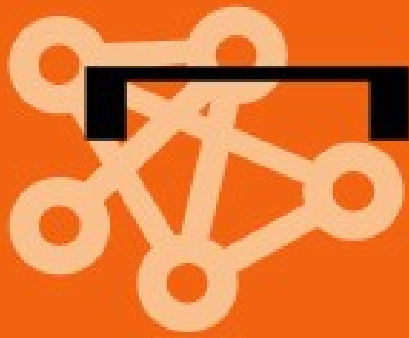
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Election systems

Easy transportation



- Weight 61 lb (27,5 kg)
- ABS suitcase folded 38"x23.8"x7,5" (96 x 60,5 x 19cm)

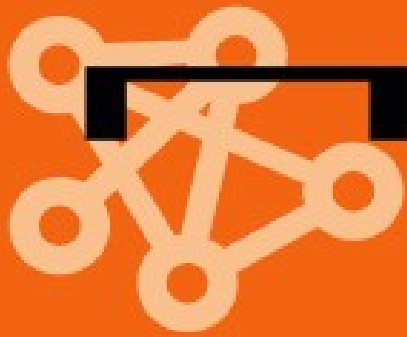


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Election systems

Compact storage





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Election systems

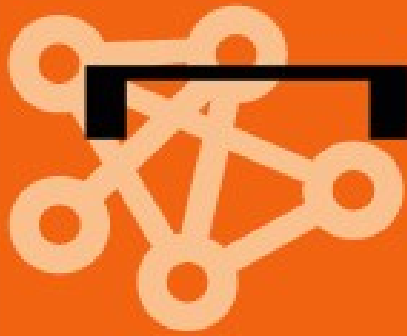
Easy storage



Auxiliary battery connectors

- Data are retained 20 years without battery support
- Requires minimum maintenance because has no build in batteries



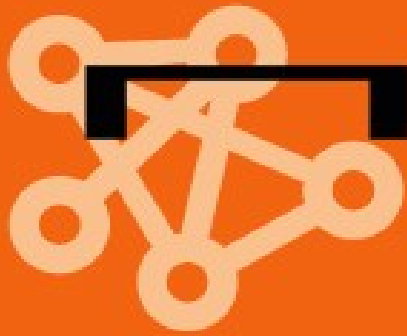


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Election systems

Benefits NEDAP Election Solutions systems

- **Time saving**
- **Quality increase**
- **Easy preparation**
- **Immediate results**
- **Costs savings**
- **User friendly**
- **Secure**

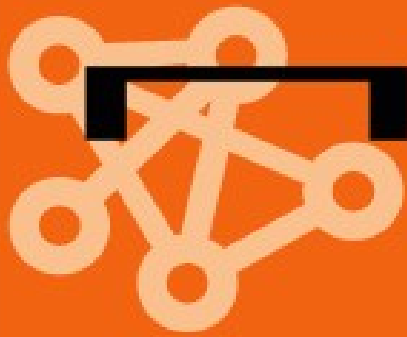


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Election systems

Elimination of:

- **Counting by hand**
- **Invalid votes**
- **Recounts**
- **Errors in documents**
- **Fraudulent procedures**



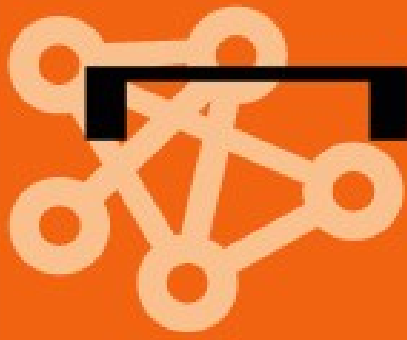
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Election systems

ON LINE VOTING SYSTEM



- Online voting with internet technology
Combined with voting in polling stations
- Not a nationwide system but added
virtual polling stations per municipality



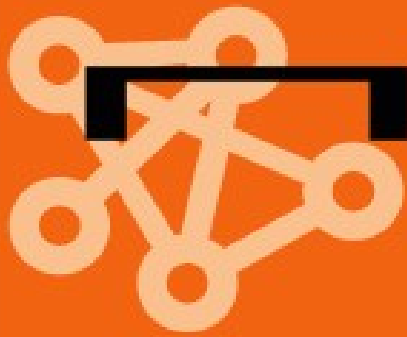
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Election systems

The Nedap online voting principle

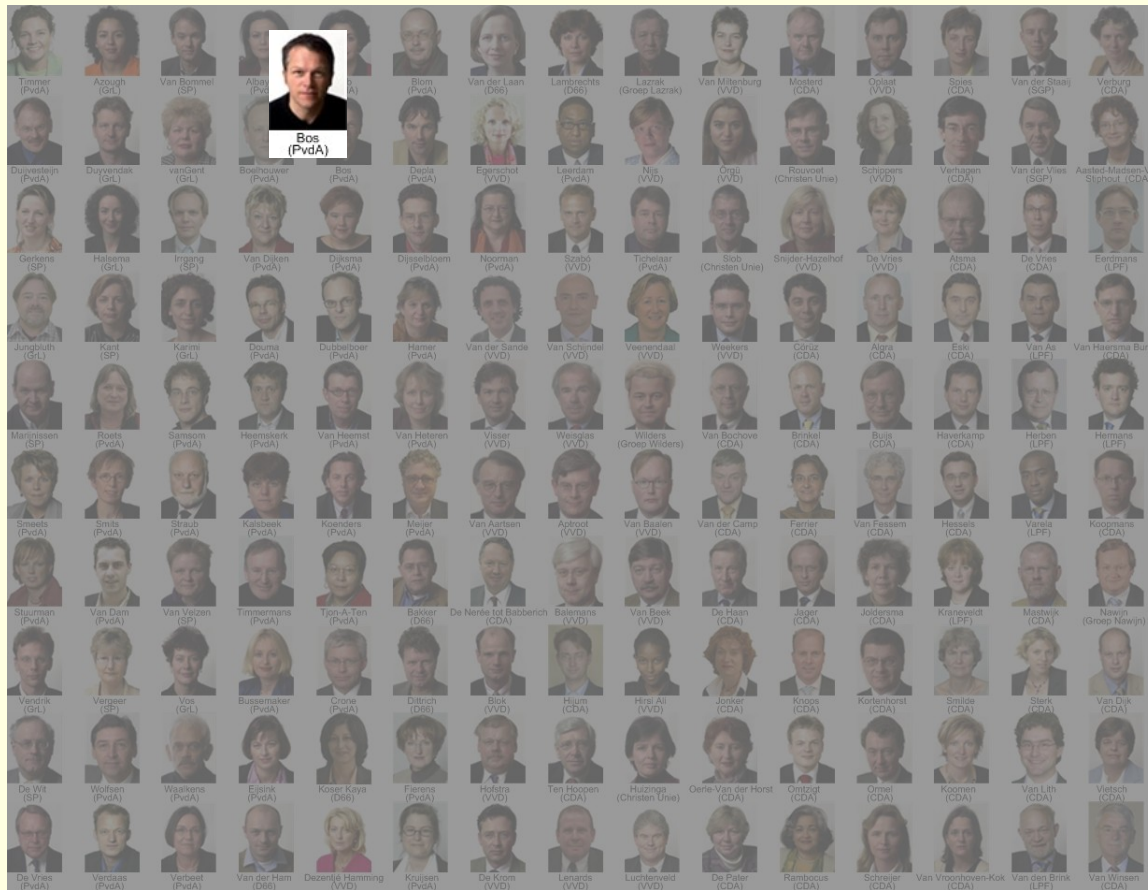
STEP 1:
The voter gets
the list of
candidates



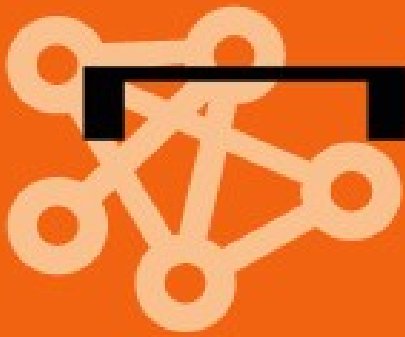


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STEP 2:
the voter
select a
candidate



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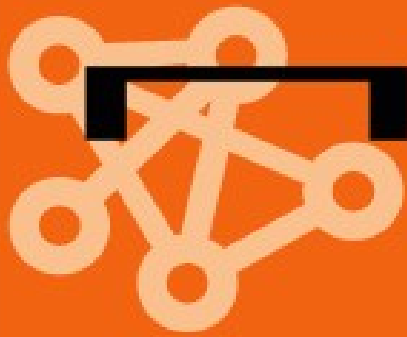
Election systems



STEP 3:



The system generates a 'mines-list'. This is a random selection out of the candidates.

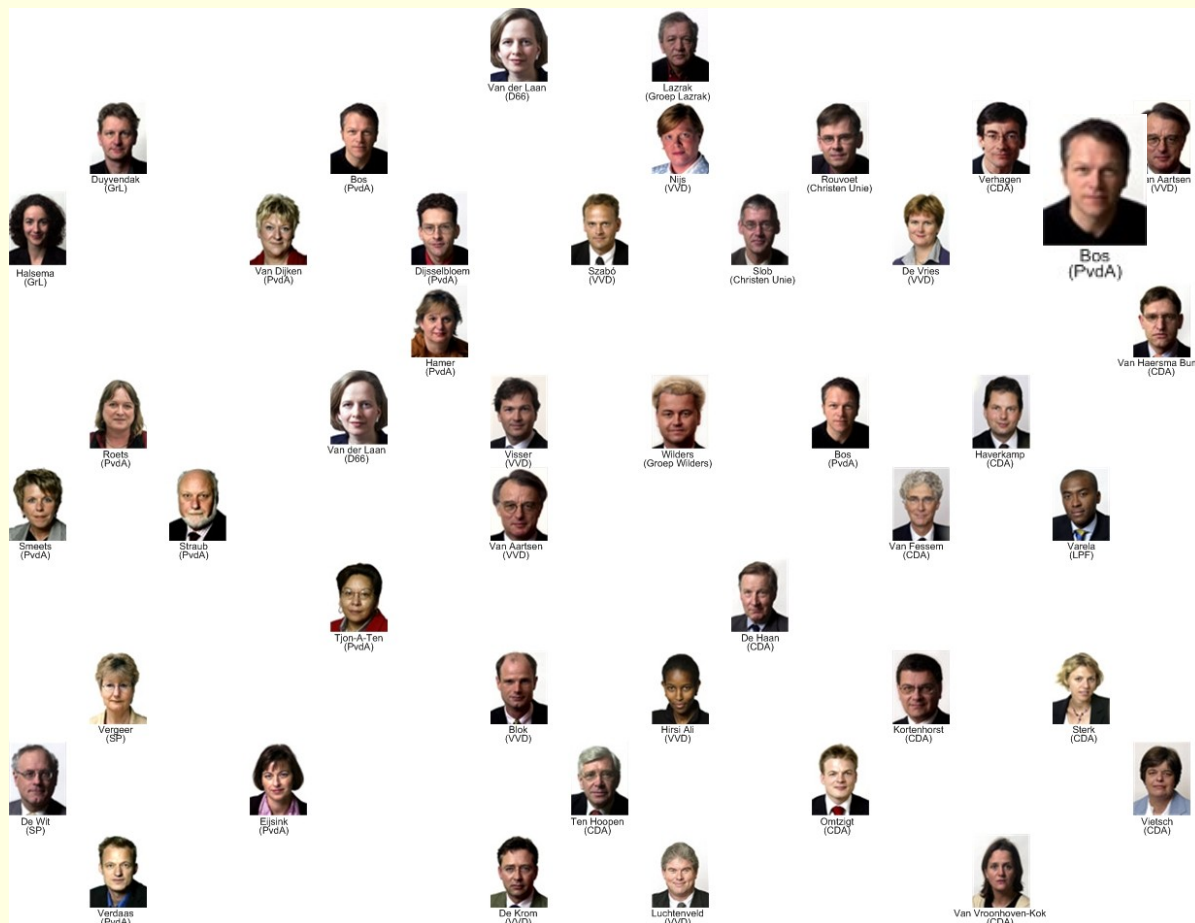


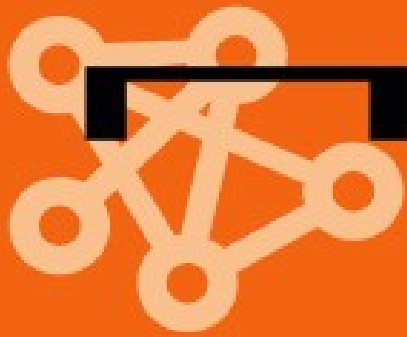
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STEP 4:

The system adds
the selected
candidate to the
minus list
generating the
'plus-list'

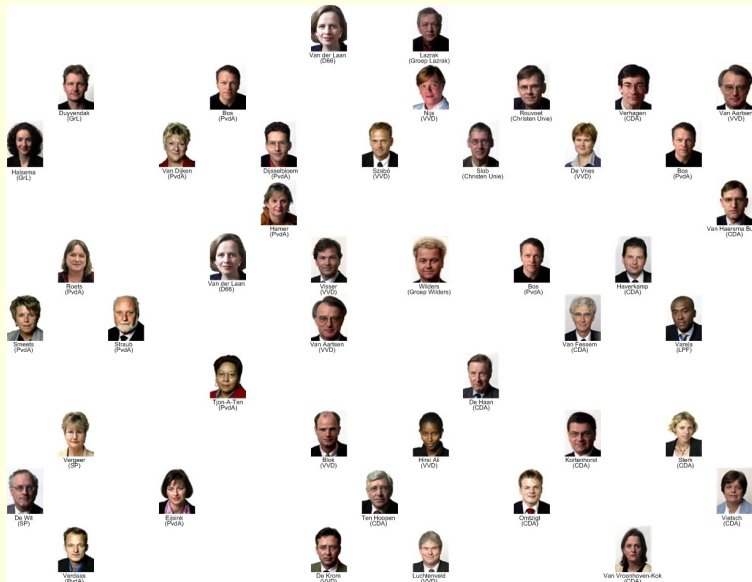


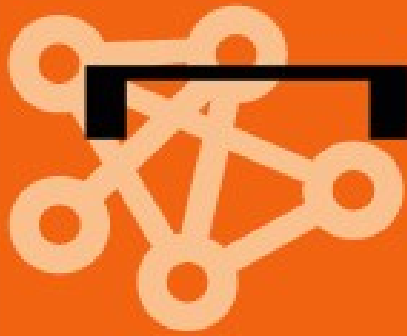


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Election systems

- There are two servers, municipality has a server and a server is placed under supervision of a trusted third party
- The system sends the 'plus-list' to server 1 and the 'minus-list' to server 2

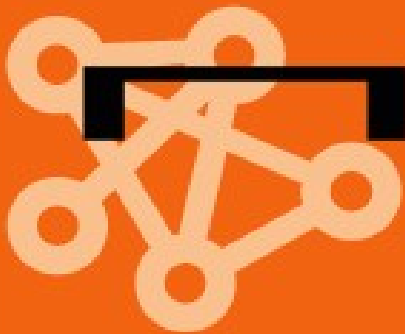




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Election systems

- **Depending on the connection between the polling stations and the servers the plus and minus lists of the voters who vote on the polling stations are removed continuously or directly after poll close.**
- **The online selections of the voters that have voted on a polling station are overruled and replaced by the final vote made on the polling station under controlled conditions.**

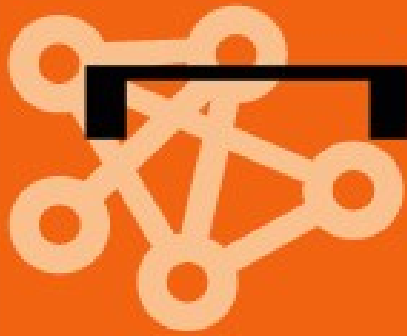


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Election systems

- Servers 1 and 2 exchange ‘plus- & minus-list’ totals
- The ‘plus- en minus-list’ totals are balanced
- This results in the totals per selected candidate for the virtual polling station, thus the final result of the virtual polling station is available.
- The result of the virtual polling station is added to the result(s) of the physical polling station.
- This sum gives the final election result.

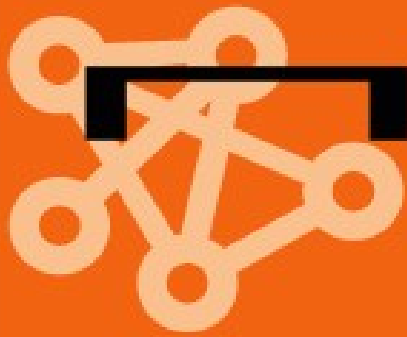




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Election systems

- **The procedures to determine the result are not changed in any way, the on line votes are simply on an extra virtual polling.**
- **The introduction of on line voting does not ask for forced change or modification of existing**
- **The method is also functions in referenda**
- **No cryptography of election data thus no complicated key management.**
- **A transparent cloaking system which can be explained to all the voters and mimicked with printed documents.**



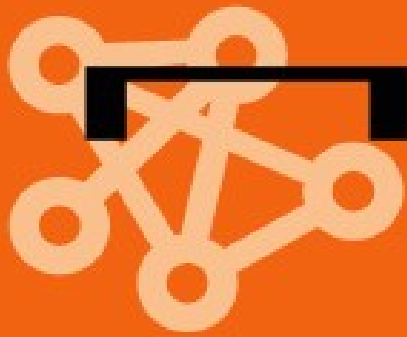
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Election systems

Traditional polling station



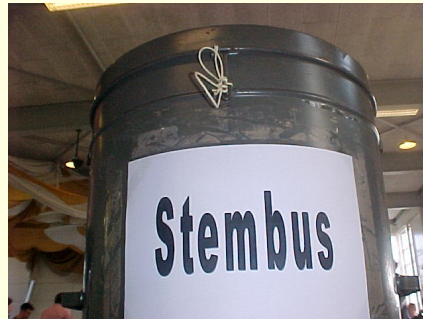
- Stays functional independent of the used method of registering the votes and counting the results.
- The registering of voters should preferably take place on line

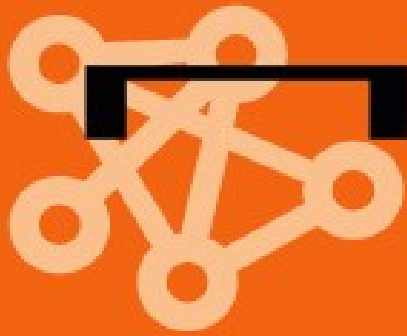


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Election systems

- **The voters can overrule their on line vote in a controlled environment.**
- **The voter does not have to choose in advance where and how to vote**





Does online voting suffice?

1. **One man one vote**

2. **Free of coercion or fraud**

Because it is possible to overrule the on line vote in the polling station coercion, family voting and vote selling lose their potential value

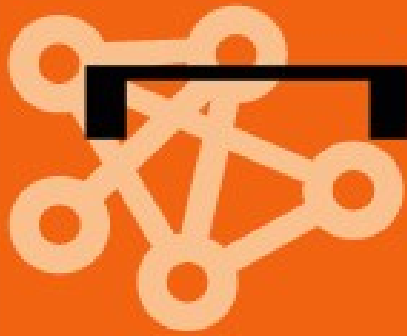
3. **Accurate**

Independent test institutes can certify the system

4. **Transparent**

5. **Reliable**

Decentralized structure with physical polling station as back up

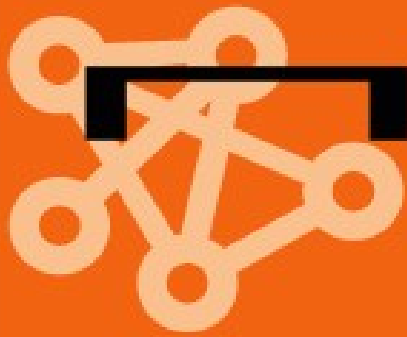


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Election systems



- **Conform all requirements**
- **Voters can vote from every location**
- **Polling stations remain in use**
- **Higher turnout also in the future**
- **Controllable costs.**



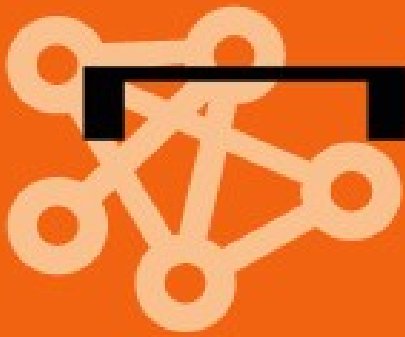
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Election systems



Conclusion

- Nedap developed a reliable on line election system
- Its time to test and implement



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Election systems

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