

Secure Electronic Voting

Electronic Voting – New Challenge of eDemocracy

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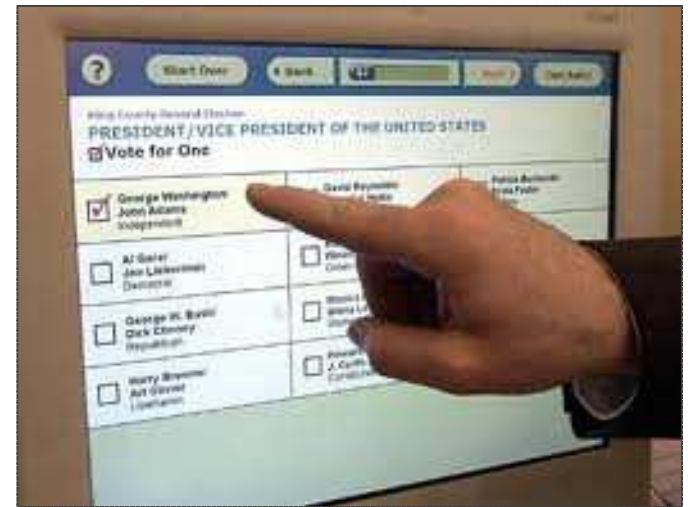
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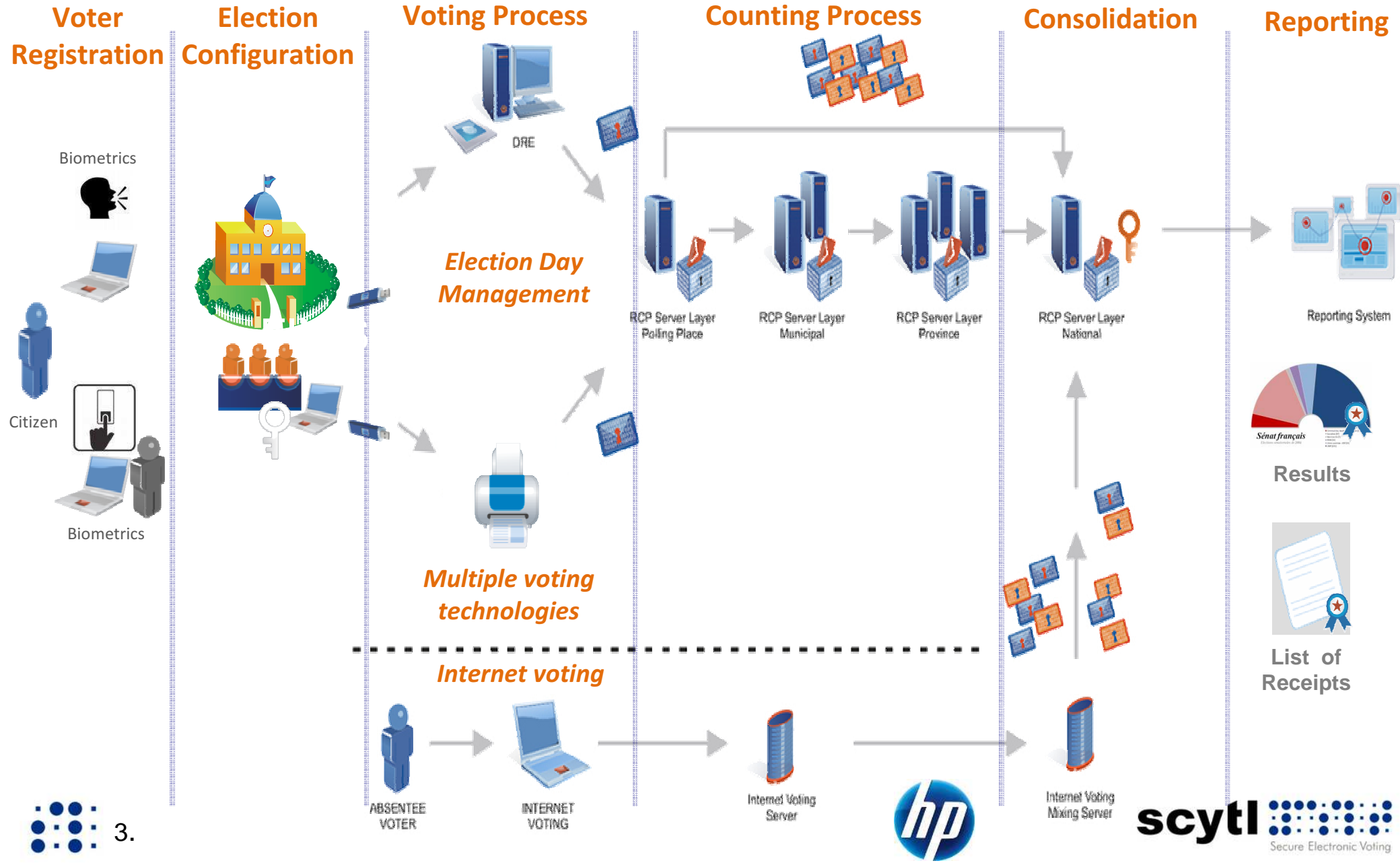
Electronic voting is regarded by many governments as the **next natural step** in the **evolution of electoral modernization and democracy strengthening**.

Electronic voting offers many advantages over the conventional paper-based electoral systems, including greater speed and accuracy in the counting process, prevention of involuntary voting errors, better accessibility for people with disabilities, lower costs, support of multiple languages, flexibility, etc.

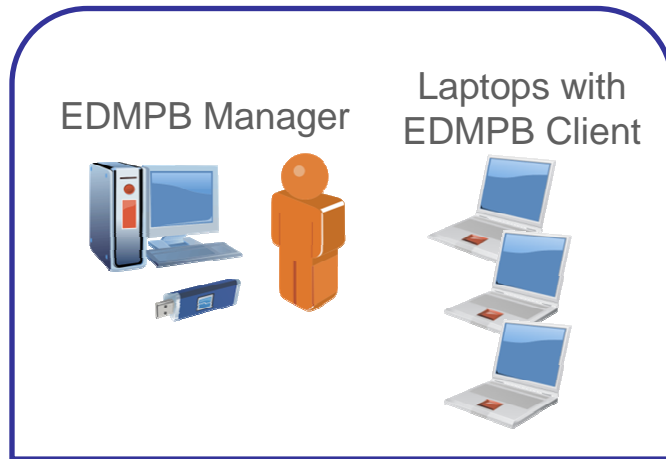
Currently, e-voting is **the system used more than ever** and is considered **the most transparent, secure and trustworthy** by the governments and citizens.



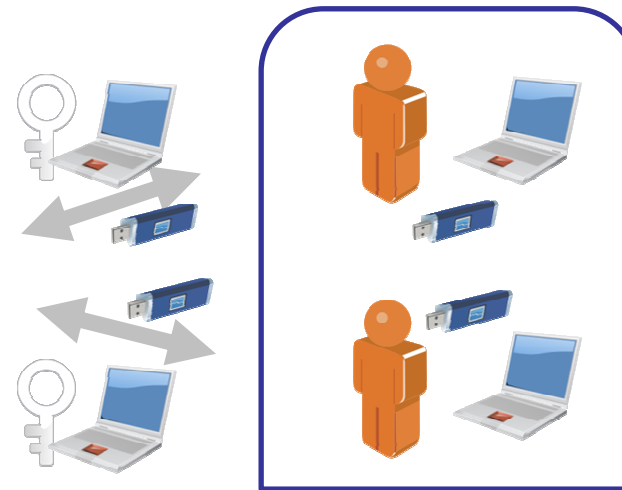
End-to-End Electoral Modernization



DEC or CEC

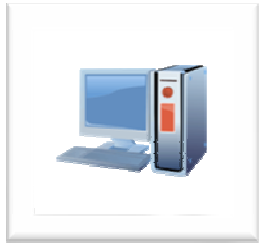


Precincts

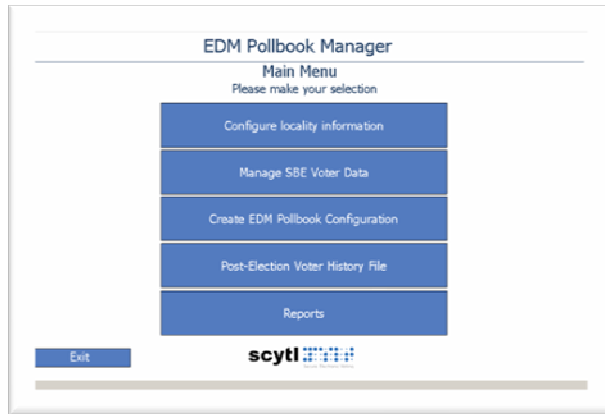


1. Precincts have a computer with some peripherals and special ScytI's poll book software or managing voters' lists during Election Day.
2. These computers can be disconnected from any network and manage a local roll or be connected to a central system, in which case real-time participation rates, vote anywhere and other features are available.
3. Minute-book and other reports can be generated by the poll book system, printed and/or electronically sent to District Electoral Commissions.
4. Special help provided by a decision support system can be part of poll book system, saving calls to support center.

EDMPB Manager



Windows-based
standard computer



EDMPB Client



Windows or Linux
standard computer



- Single-point installation for each locality
- Managed by the Registrar of Elections or equivalent
- Main tasks:
 - Manages voter info sent by electoral authority for each election
 - Generates a configuration file for each EDMBP Client
 - Processes the data from each Client at the end of the election to create the voter credit file

- Installed on each laptop/DRE used at the precincts; managed by the Officers of Election
- Software installed once; different configuration file per election
- Main tasks:
 - Allows to update the list of voters before polls open
 - Manages the list of voters and PBC during election
 - Provides specific instructions to Officers of Election
 - Exports updated list to be sent to EDMPB Manager

There are two key challenges that governments are faced with when trying to involve their overseas citizens in their electoral processes.

The first is related to the reliability of the channel used to cast their votes, as many are very untrustworthy and do not provide adequate authentication methods or security, which ultimately results in the disenfranchisement of many of the citizens living abroad (Absentee Voters).

The second is related to maintaining an updated Absentee Voters (AVs) registry database that will allow voters to access the remote voting channel used by the corresponding country.

Facilitating absentee voters to access to their electoral processes.

Provide platform that can be used to register AVs and allow them to securely and easily obtain voter credentials in every election.

Absentee Voters Challenges

Situation faced by AVs when registering

Embassy/Consulate



Electoral Official



Registration Form



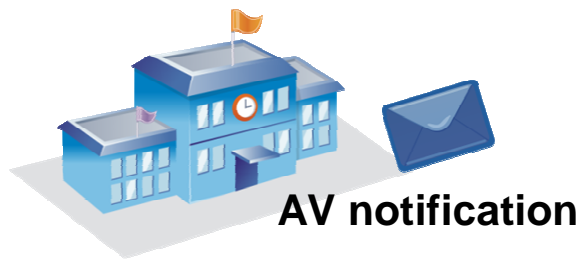
Absentee Voter (AV)

- Currently, AVs must register to vote in person at the corresponding embassy.
- This can be very time consuming, expensive and inconvenient for AVs, since they may live in remote areas and have to travel to the large cities where the embassies or the consulates are situated.

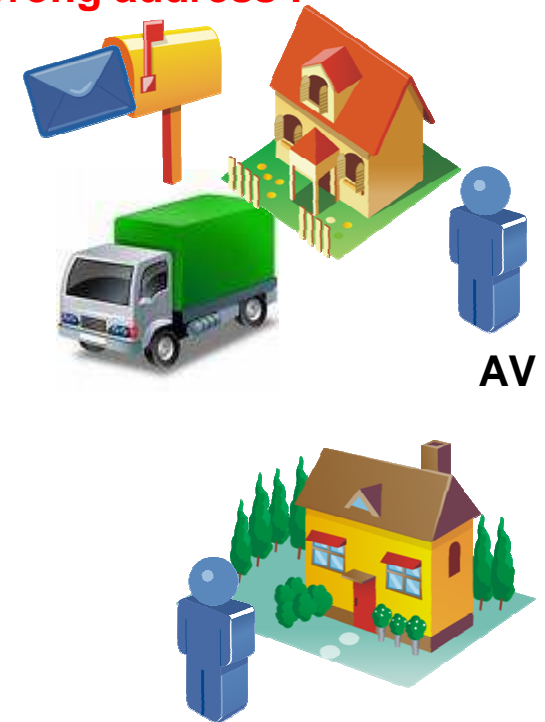
Absentee Voters Challenges

Situation faced by AVs when changing home

Embassy/Consulate



**Return to sender
wrong address !**



- AV's change home and the data on the electoral roll are not updated due to the inconvenience of the current registration system
- This means that the AV notifications are sent to the wrong address (non-current) and therefore never reach the corresponding AV

Absentee Voters Challenges

Situation faced by AVs when voting

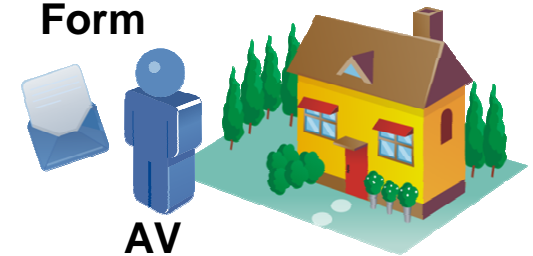
Embassy/Consulate



Electoral
Official

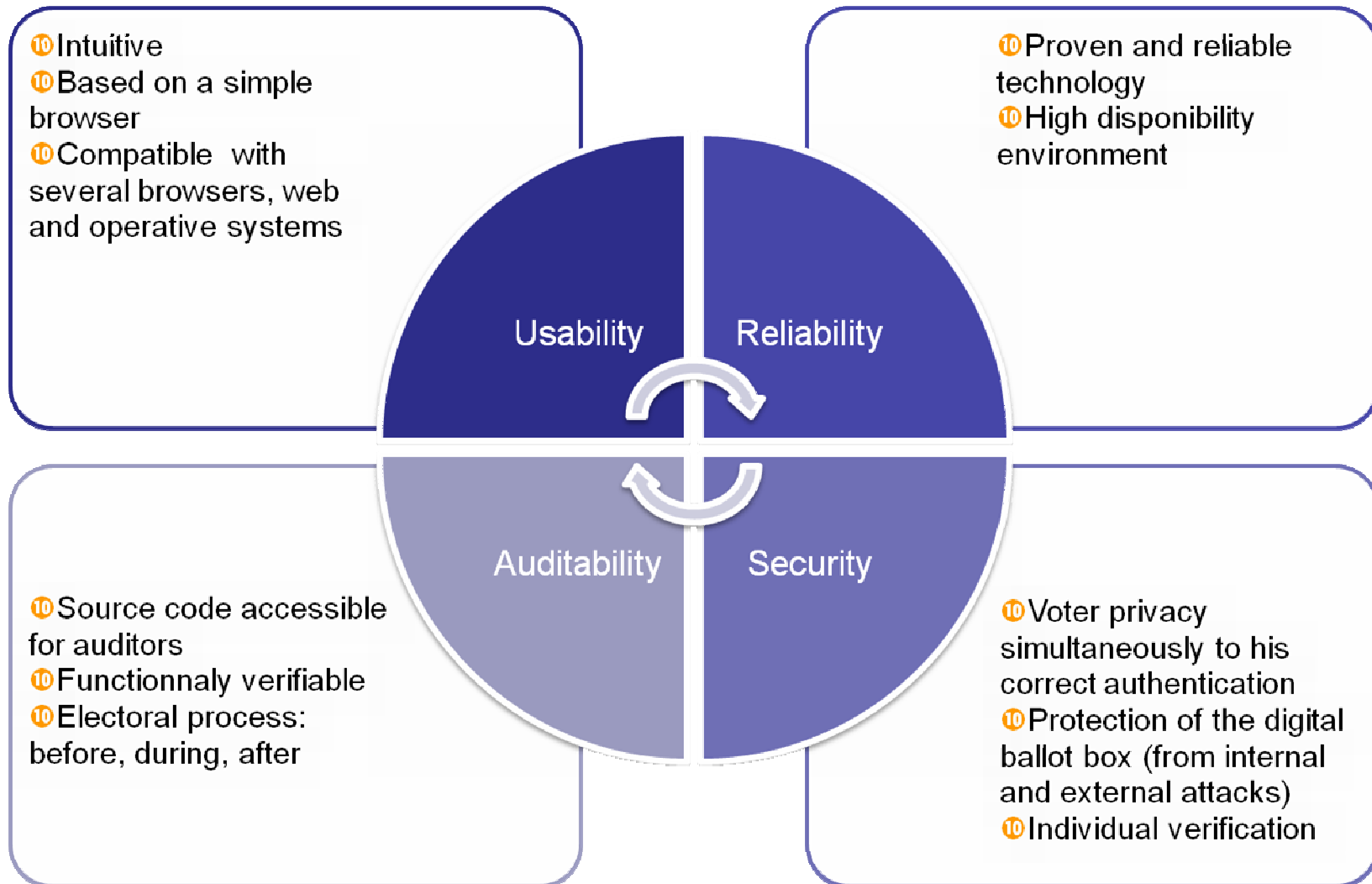


Registration Form

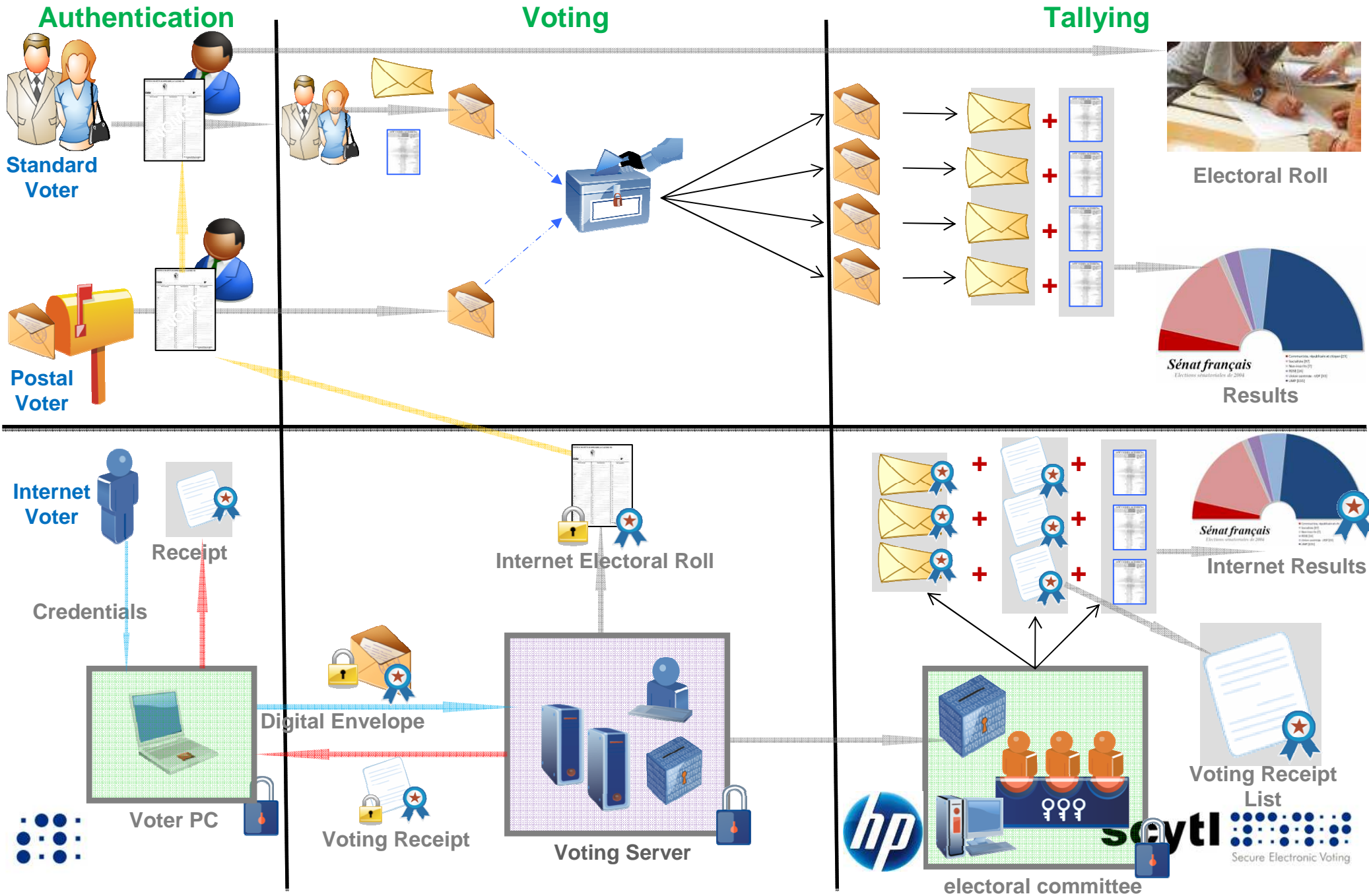


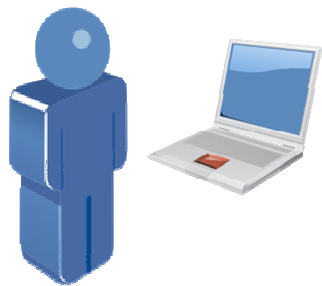
AV

- AV's after changing their address must travel to their nearest embassy/consulate, update their information and vote
- This, as with the registration, process is very time consuming, expensive and inconvenient for AVs.
- For seafarers this situation is worse, because they have to disembark from the ship to be able to vote in a place they have previously indicated in the registry form.

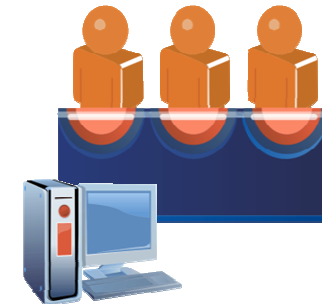
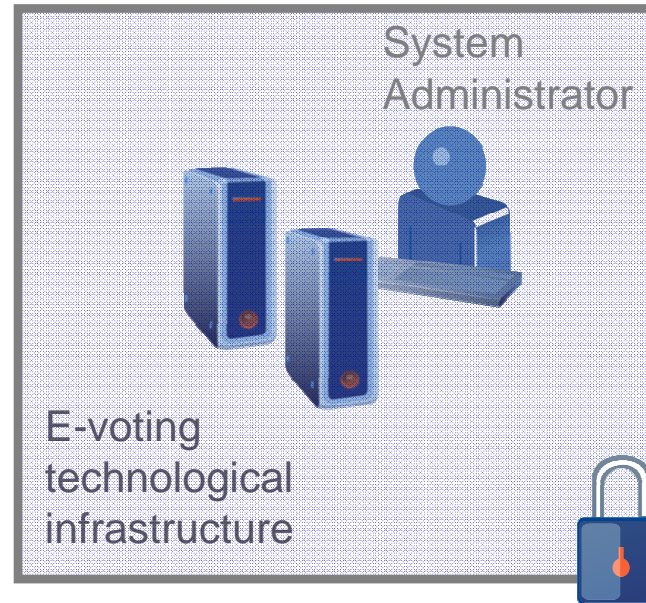


Internet Voting Process vs. Postal & Standard Voting





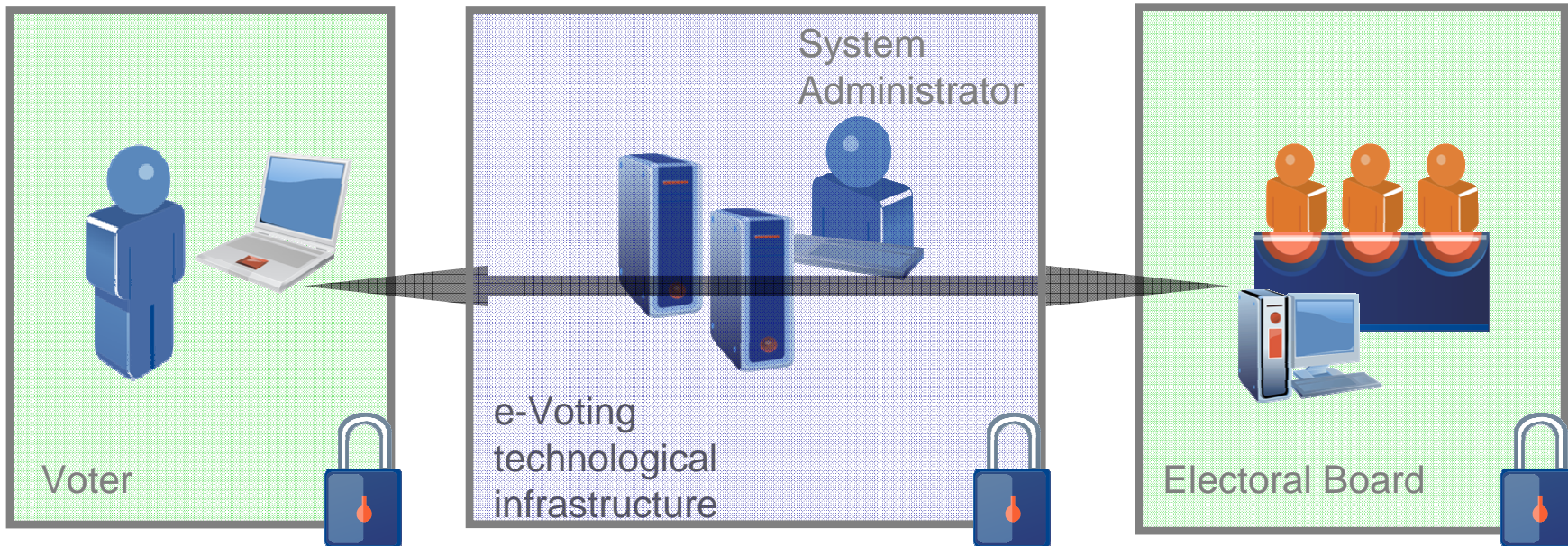
Voter



Electoral Board

Electronic voting with conventional security measures

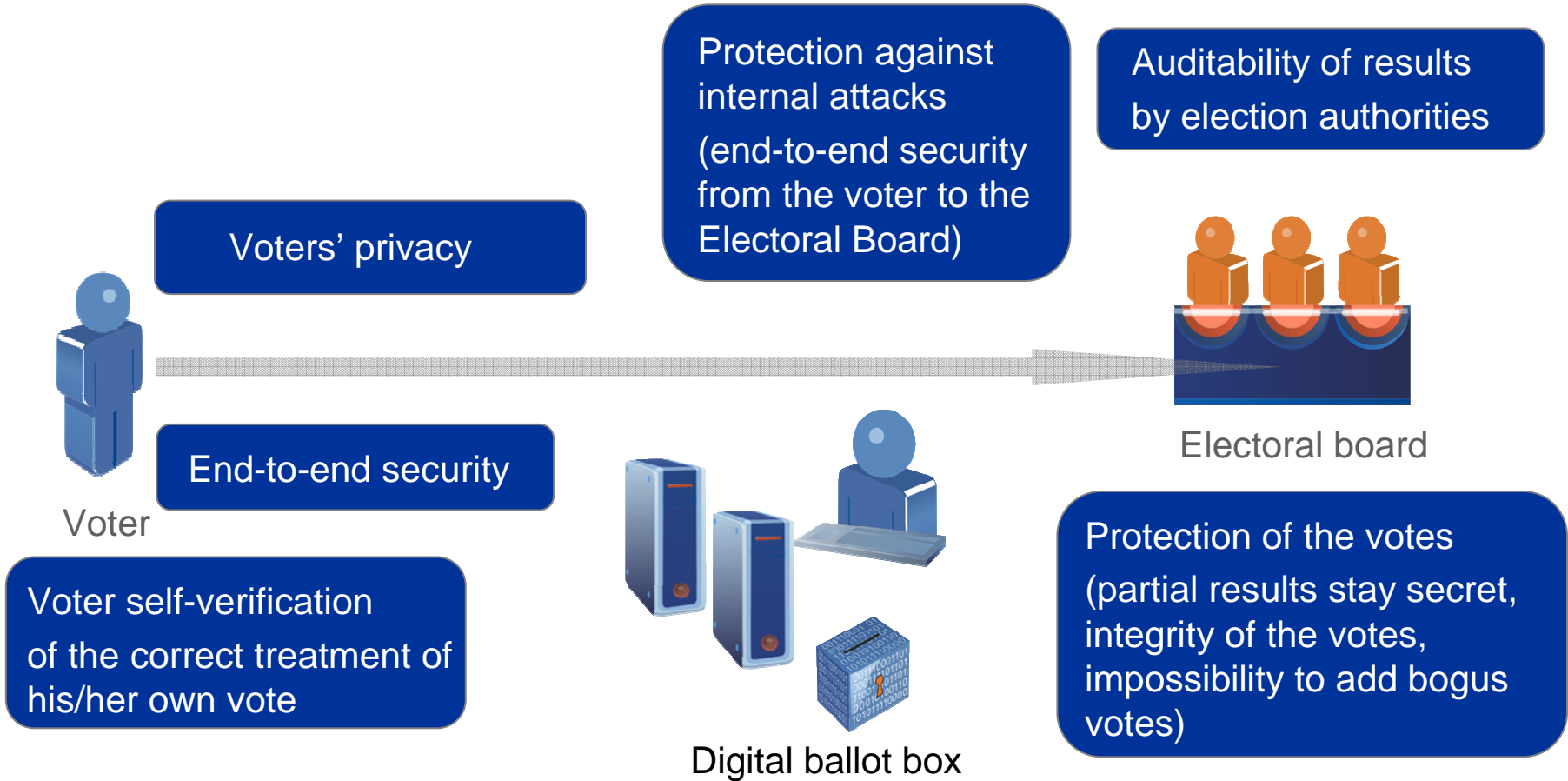
- Protection only **focused on external threats** and attacks.
- Voter's authentication solved but voter's privacy not addressed.
- **Electoral board's null role.**
- **Lack of voter-verifiability** ("Thank you for having voted" messages).



Electronic voting with Scytl's specialized security technology

- Application-level **cryptographic protocol running on the voter's device** and on an air-gapped electoral board server.
- **Protection focused on internal threats** and attacks.
- Focus on the **specific security requirements of voting** rather than on the generic ones.

ScytI' specialized e-voting security technology is focused on the specific security needs of elections



Digital Certificates

Pre-existing
(eID, banking smartcards, etc.)

Non pre-existing
(PKI infrastructure)

Specific Voter Credentials

Direct delivery
(post, e-mail, phone, fax, sms, etc.)

After registration
(in-person, remote by postal mail, online)

Pre-existing authentication mechanism

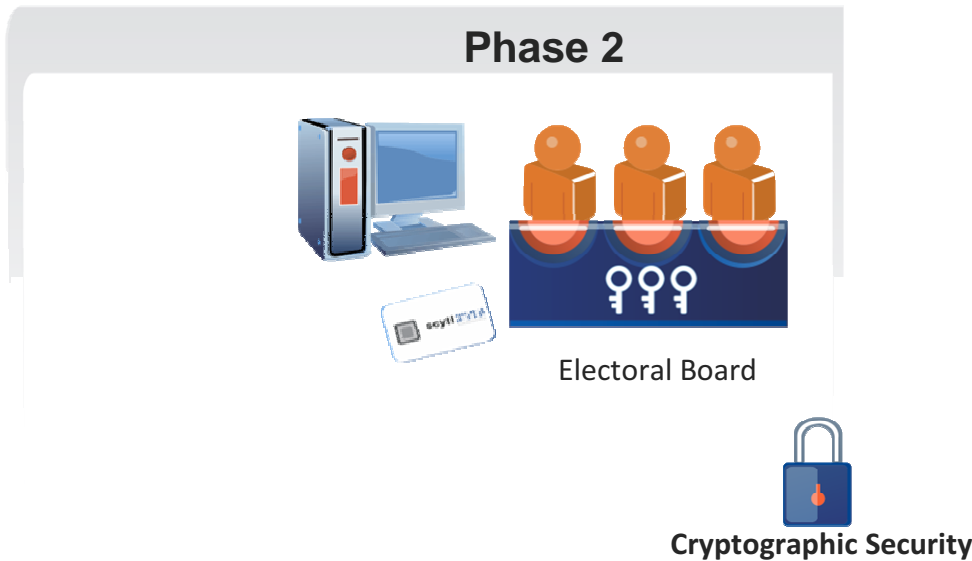
Obtaining a voting credential

With additional specific voting credentials

Without additional voting credentials

Phases of a typical e-voting process

Phase 2: Creation of the electoral board

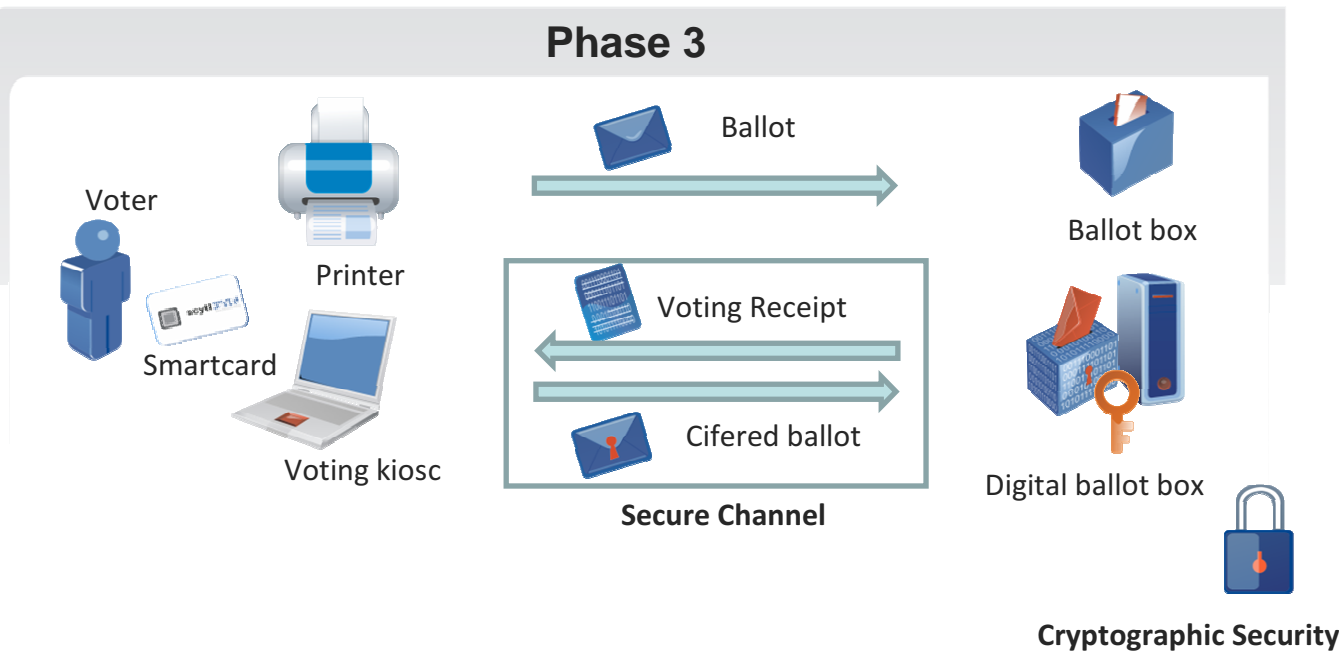


An electoral board is created before the e-voting process starts.

Each of the members is given a share of the private key used to open all of the digital votes.

A threshold is required to reconstruct the key at the end of the e-voting process.



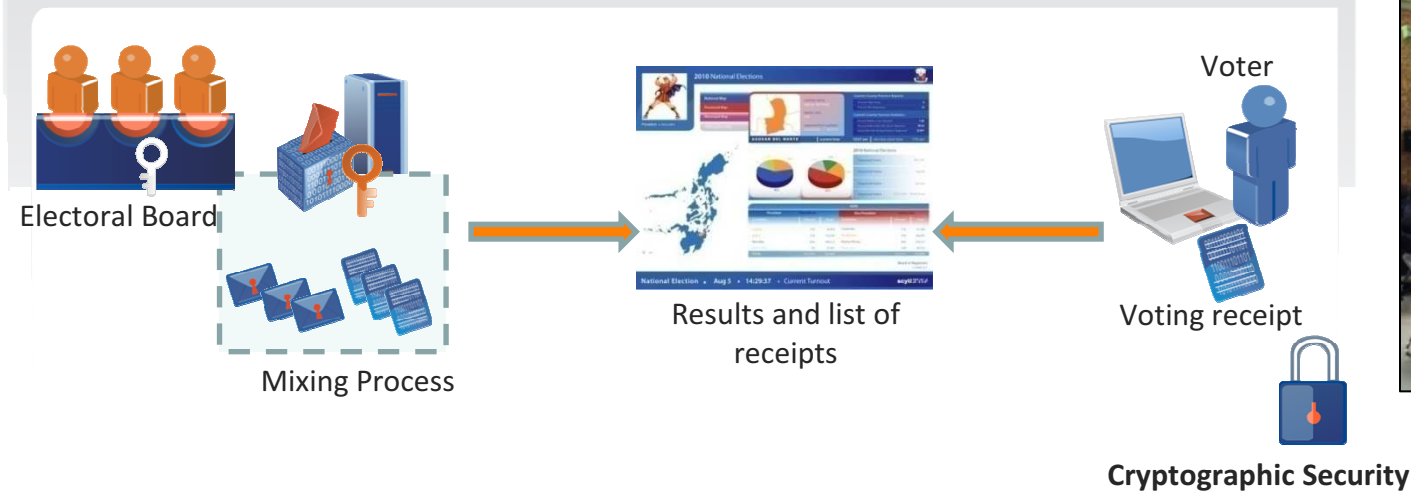


The voters can easily participate from any PC with Internet access. If some of the target participants do not have access to the Internet, various polling centres can be set up. After voting, participants are issued a receipt that allows them to check whether their votes were counted in the final tally.

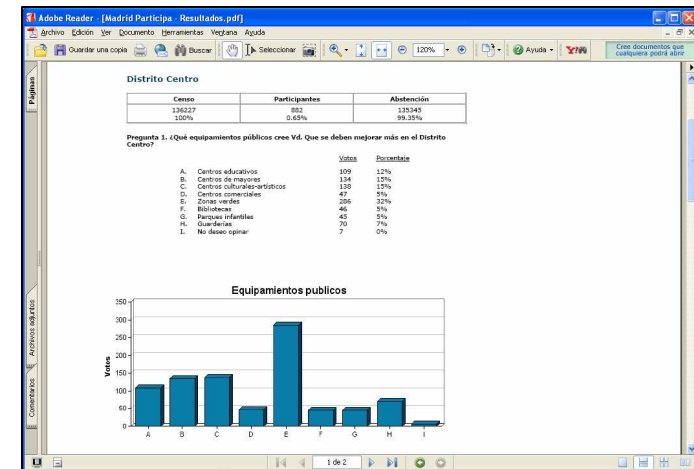
Phases of a typical e-voting process

Phase 4: Results & Verification

Phase 4



Once the voting process is closed, the committee reconstructs the private key to open the digital ballot box and tally the votes. The results and a list of the voting receipts are published so that participants can check that their vote has been counted.



Equal opportunities for all, because everyone is important!

Scytl believes that technology should be used to improve people's lives. That is why when we design our products we try to make them as usable as possible for all voters including visually impaired as well as disabled.



In numerous elections, Scytl has provided electronic voting solutions for people with visual disabilities and for many of them it was the first time that they were able to vote independently. In fact, Scytl has worked with several blind organizations in these projects in order to define the most appropriate voting interface.

Blind or visually impaired people can vote autonomously by means of electronic voting terminals using headphones and special keyboards. So far Scytl has used two different approaches to make accessible their voting systems:

- Accessibility options based on audio-files
- Voting systems compatible with Screen readers



References Worldwide



Bosnia - Herzegovina



Operation BRAVO Foundation



सत्यमेव जयते

Government of Gujarat



African Union



BMWF^a

Bundesministerium für Wissenschaft und Forschung



Ajuntament de Barcelona



Henrico County Virginia



Parliament of Nuevo Leon



Ministry of JUSTICE



Publique et Canton de Neuchâtel



REPUBLIKA NG PILIPINAS



Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE
DES
AFFAIRES ÉTRANGÈRES
ET EUROPÉENNES



RUSHMOOR BOROUGH COUNCIL



South Bucks District Council



Mendoza ARGENTINA



MINISTRY OF LOCAL GOVERNMENT AND REGIONAL DEVELOPMENT



scytI Secure Electronic Voting



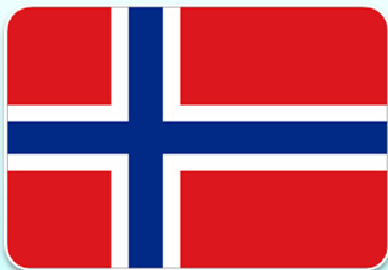
INDIA / Internet Voting

- State of Gujarat, 50 mil. citizens, 2010 Municipality Election
- Registration of voters by filling-up a form
- Mayor step in Indian's electoral history, first time ever



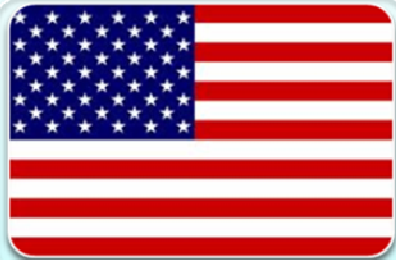
Bosnia & Herzegovina / EMS and voter list

- OSCE/CEC, Election Management System (development, delivery and implementation of software solutions)
- Presidential and Parliamentary elections, October 2010



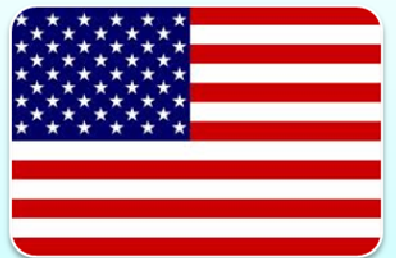
Norway / Internet Voting

- Ministry of Local Government and Regional Development
- Municipality elections 2011, a full nationwide rollout of the Internet voting system is scheduled for 2017



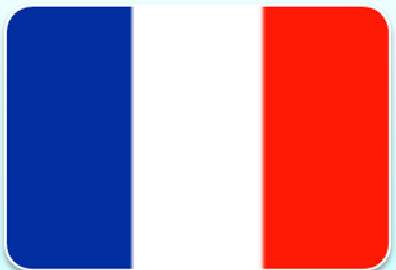
USA, Washington D.C. / Voter List

- The District of Columbia, ScytI's license for ePollBook™ software (touch screen netbook, real-time voter check-and verification process), Primary and General elections



USA, New York / Overseas I-Voting

- The New York State Board of Elections, “Power to MOVE” solution to support the state’s overseas voter community
- ScytI's complying technologies for overseas voters



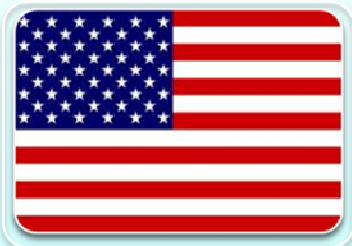
France / Internet Voting (Diaspora)

- Ministry of Foreign Affairs, French Senate and House of representatives, Internet voting platform
- More than 1 mil. French Citizens living abroad can vote (French voters residing in America and Africa)



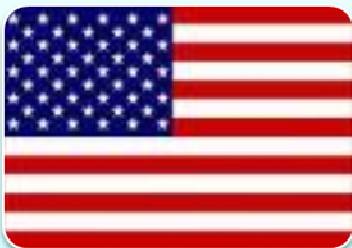
Austria / Internet Voting

- Ministry of Science & Research, 230749 students, 21 Universities
- 376 simultaneous elections, 100 political parties, 2411 candidates,
- Vienna ebiz eGovernment award for carrying out the first binding Internet election in Austria



USA, State of Florida / Internet Voting

- Reliable remote e-voting channel for overseas voters (especially the military), November 2008, U.S. Presidential election
- First Internet Voting platform used in the U.S. in a binding public election



USA, State of Virginia / Voter List

- Secure and usable ePollBook, replacement of paper voter lists and enhancement the Election Day Management
- Reducing 80% the calls to the support center, U.S. Presidential election



Austria / Voter List

- Ministry of Science & Research for 21 public universities
- Handling of the voter list for 240.000 voters
- Managing of the elections (preparation, creation of the election until the consolidation with the paper ballots)



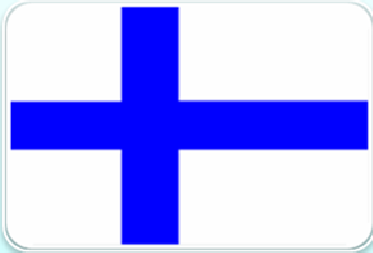
Switzerland, Neuchatel / Internet Voting

- Elections and Referenda in the Canton Neuchatel
- Since June 2008 people living abroad are allowed to vote through the Internet using ScytI's technology



Spain, City of Madrid / eParticipation

- One of the largest events in Europe (21 binding consultations)
- Multichannel e-voting platform (136,000 / nearly 3 million citizens)
- Variety of voting channels (with el. voting terminals to mobile)



Finland / e-Voting

- Ministry of Justice, Municipal elections, e-voting from supervised terminals connected to a central server over the Internet
- ScytI's solution was audited by an university research group



Great Britain / Internet Voting

- The Ministry of Justice, the councils of South Bucks, Rushmoor
- Remote e-voting solutions in multichannel scenarios (paper and postal voting) in local elections



Philippines / Internet Voting (Diaspora)

- The Commission on Elections (COMELEC); Internet voting for ca 30000 Philippines leaving and registered in Singapore; voting from the Embassy via computers connected to the Internet
- Official test of 4000 hackers before opening – all unsuccessful



Australia, State of Victoria / Internet Voting

- VEC, Lower and Upper House elections; Internet Voting, Phone Voting and DRE; support of 12 languages
- Blind and visually impaired citizens voting without assistance



African Union / Parliament e-Voting

- System of votations for the African Commission
- Secure system for the votations used by the African Commission in their meetings



Mexico / Parliament e-Voting

- The Parliament of the State Nuevo Leon, PressVote solutions
- Casting the MPs votes and speaking from their seats by electronic means in a convenient and secure manner, including large plasma screens and system to control attendance

Summary of main benefits

- ❖ Security (no manipulation or buying of votes)
- ❖ Cost effectiveness (extra year 2014 – 5 elections)
- ❖ Logistic and time effectiveness
- ❖ Accessibility (special solutions for blind or short-sighted voters, old-age people, etc.)
- ❖ Accessibility (voters leaving, working abroad - absentee)
- ❖ Transparency (voting receipt)
- ❖ Higher turnout, participation on elections



www.scytl.com

