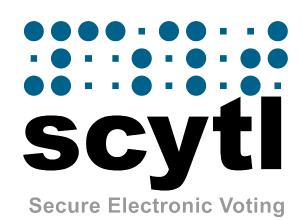
ITAPA Conference Scytl Secure Electronic Voting



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- ☐ Examples of e-voting
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About Scytl

- Specialized in highly secure electronic voting solutions.
- 12 years of research and development: First European PhD theses on e-voting security.
- Electronic voting platforms: security, trust, and privacy.
- International agreements with **Hewlett-Packard**, **Oracle**, **Accenture**.
- Advisor of U.S. Electoral Assistance Commission, Council of Europe, Joint Research Centre of the European Commission, NIST.
- 2005 IST **Prize by the European Commission**, 2006 **RedHerring 100** by RedHerring Magazine and 2006 **Global Innovator** by Guideware Group, etc.













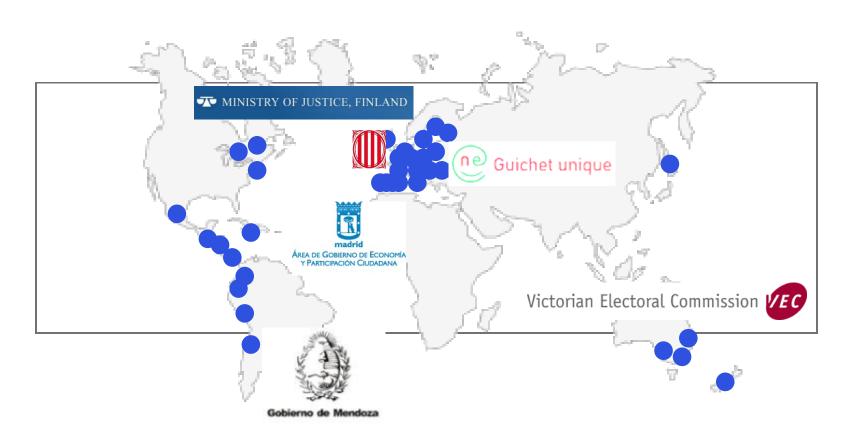


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Examples of Scytl's e-voting projects





Canton of Neuchâtel (Switzerland)

Requirements

• Canton of Neuchâtel needed to enhance the security of the Internet voting system available on their e-Government portal, Guichet Sécurisé Unique.

Strategic solution:

- Scytl's technology was selected: the best levels of trust, security and usability for Internet voting, plus a smooth integration with Neuchâtel's e-government portal.
- 4 to 8 e-consultations, binding electoral processes and referenda per year.
- The Internet and postal voting are generally open for 15 to 30 days prior to the day of the traditional paper-based election or consultation.
- Internet channel has received up to 60% of the total votes tallied.
- Swiss Federal Government recently approved e-voting for the rest of Cantons





Ministry of Justice (Finland)

Requirements

• The Ministry of Justice needed to supply **secure**, **accessible and scalable e-voting terminals** for the 2008 Municipal Elections.

Strategic solution:

- After an in-depth research of different solutions, Scytl's technology was selected: the best levels of security, accessibility and scalability for Internet voting.
- Scytl has provided an e-voting from supervised stations.
- Scytl's solution has been successfully tested by the Ministry of Justice and it will be used for the next municipal elections.
- The Parliament of Finland has accepted the proposed change to the election law.





State of Mendoza (Argentina)

Requirements:

• The Government of the State of Mendoza, one of the most advanced in e-Government in Latin America, wanted an **Internet-voting platform to electronically carry out the elections** to the Board of the State Medical Association in December 2005.

Solution:

- HP and Scytl provided over 100 voting terminals to 35 hospitals, all connected to a central server system via the Internet.
- Scytl's Internet e-voting software was used in the elections, which involved over 3,000 candidates.
- More than 15,000 doctors were invited to participate in this binding election. The participation rate increased a 55% compared to the previous non-electronic elections.
- This election was the first binding Internet election in Latin America.







Government of Catalonia (Spain)

Requirements:

• The Government of the State of Catalonia, one of the most dynamic regions of Europe, wanted to perform an **Internet voting process** during the Catalan parliamentary elections in November 2003.

Solution:

- Scytl provided Internet e-voting software to allow 24,000 Catalan citizens residing abroad to cast their votes via the Internet.
- Scytl also provided remote training and support to turn Catalan delegations into polling centres in several different countries.
- This e-voting initiative was Spain's first remote electronic voting experience in a public election.
- The Government of Catalonia is now working on several internal e-voting projects.





Madrid Participa (Spain)

Requirements:

 The City Council of Madrid wants a secure e-voting platform to carry out a series of multi-channel citizen consultations in different districts of Madrid to gather citizens' opinions on several local issues that directly affect them.

Solution:

- Scytl has provided a complete and secure multi-channel e-participation platform: Pnyx.government.
- The first e-consultation took place in 2004 and was one of the largest carried out in Europe to date, involving about 135,000 citizens from the central district of Madrid.
- After the first consultation, the City Council has used periodically the system to perform different e-participation processes; currently more than 21 binding consultations involving over 3M people are being carried on.
- The results are being highly satisfactory for the Council. The use of technology has increased the participation rates up to 146%.





State of Victoria (Australia)

Requirement

• The State of Victoria wanted to implement an **e-voting solution using secure voting terminals (DRE)** to support multiple languages and to allow blind and visually impaired citizens to vote with total privacy.

Strategic solution:

- HP and Scytl provided reusable voting terminals based on standard PCs and Scytl's e-voting software. The terminals support 12 languages and include features for people with disabilities.
- First binding trial: "super-voting centres" for the next parliamentary elections. Larger deployments in next elections.
- Australian Federal Electoral Commission studies deploying voting terminals in the next federal election after Victoria's pilot success.



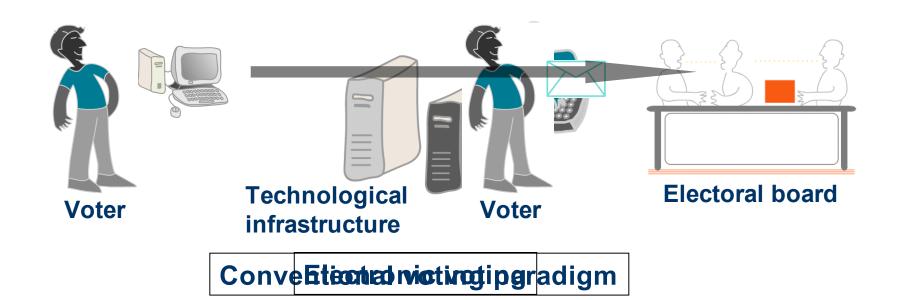


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E-voting: New voting paradigm_



*Physical differences between between the veneral and the believed by actors and the believed by actors and the best of the be

- *Lack of tangible security elements (e.g., paper envelopes, plastic urns).
- *Trust must salectoral board members as a whole.



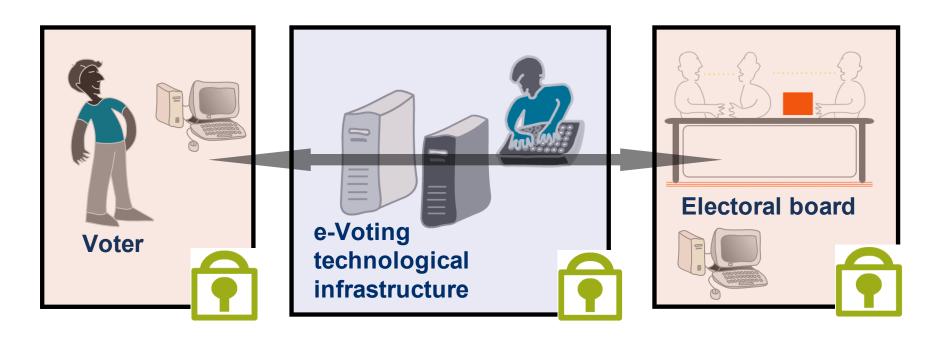
E-voting: Managing the new risks_

- •The new paradigm introduced by e-voting implies **new risks** to the electoral process, which are mainly caused by:
 - •The digital nature of votes.
 - Potential internal attackers with privileges.
 - •The inherent lack of transparency of electronic systems.
- •Scytl's unique technology addresses these new risks, with the aim of:
 - •Enabling a direct interaction between voter and electoral board.
 - •Returning the control of the electoral process to the electoral board.
 - •Avoiding having to place trust on the intermediary, i.e. the complex e-voting technical infrastructure and the privileged actors that manage it.
 - Offsetting the lack of transparency.



Scytl's

secure technology



e-Voting Waiting omitter & contast section of years are section of the section of

- · Application develocoupt our application of the voter's device and on an air-gapped electoral board server.

 •Voter's authentication solved but voter's privacy not addressed.

 •Protection focused on internal threats and attacks.

 - - Electoral board's null role.
 - •Focus on the specific security requirements of voting
 •"Thank you for having type ខ្លែខ្លាំ ខ្លាខ្លែន



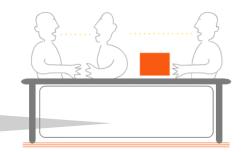
Specialized security

Specialized e-voting security technology focused on the specific security needs of elections

Voters' privacy
(while simultaneously
voters are strongly
authenticated using
the best available
technology)

Protection against internal attacks (end-to-end security from the voter to the Electoral Board)

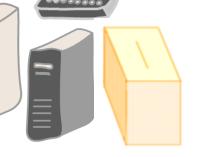
Auditability of results by election authorities



End-to-end security

Voter

Voter self-verification of the correct treatment of his/her own vote



Digital ballot box

Electoral board

Protection of the votes (partial results stay secret, integrity of the votes, impossibility to add bogus votes)



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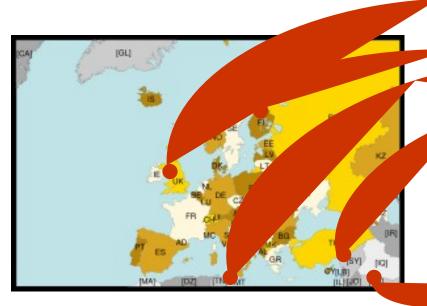
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Example

Organization of an e-voting pilot

- Several possible options for an elections' e-voting pilot:
 - Internet voting for citizens residing abroad
 - Internet voting for residents in one city (or more)
 - Internet voting for postal voters







Promotion Identification

EBoard

Voting

Results

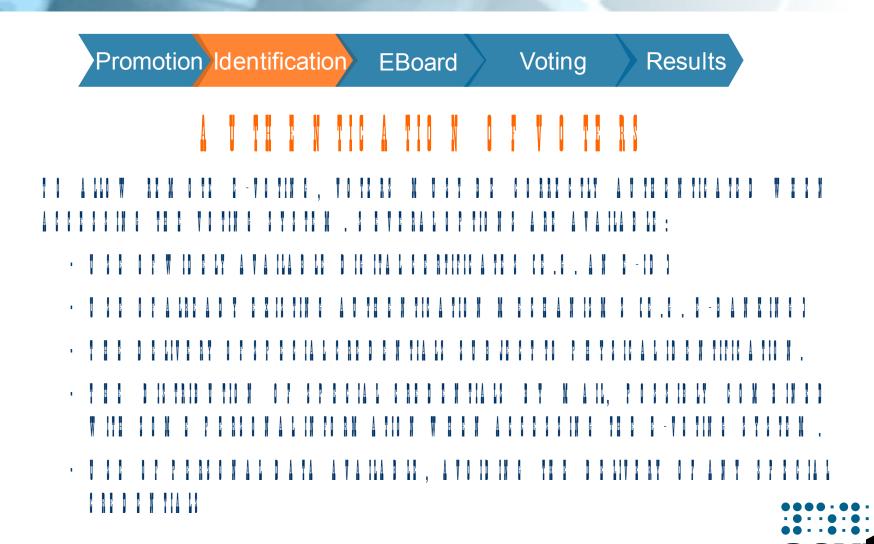
Promotion of the electoral process

Before the elections, authorities begin a campaign to inform target voters about the elections, the new electronic voting channel and how to participate. Also a support team is trained so they can help citizens with doubts or problems.









Promotion Identification

Eboard

Voting

Results

Creation of the Electoral Board

An electoral board made up of different members (e.g. parties representatives) is created before the election starts. Each of these members is given a piece 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 election. This key does not exist during the election.







Promotion Identification

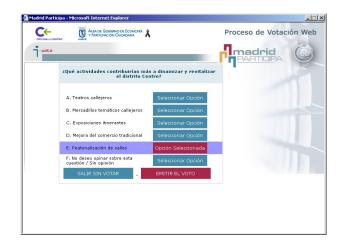
EBoard

Voting

Results

Voting process

Citizens 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 depending on the scenario**. **After voting, participants are issued a receipt** that allows them to check whether their votes were counted in the final tally, increasing their confidence in the e-voting system and the transparency of the whole process.







Promotion Identification

EBoard

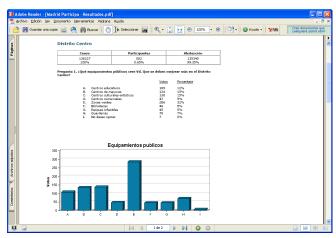
Voting

Results

Results & verification

Once the election is closed, the **electoral board 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.







Voting Process Access to the voting system

Step 1 of 4



Please, introduce your PIN code and password:

PIN code:

987654321

Password:

* * * * *



Voting Process List of candidates

Step 2 of 4

Please, select three candidates by pressing the picture of each one. When done, please press the button "Cast vote".

Candidates



CANDIDATE A INDEPENDENT



CANDIDATE B PARTY X



CANDIDATE C



CANDIDATE D
PARTY Z



CANDIDATE E
INDEPENDENT

Exit without voting

Cast vote



Voting Process Candidature selection

Step 2 of 4

Please, select three candidates by pressing the picture of each one.

When done, please press the button "Cast vote".

Candidates



CANDIDATE A INDEPENDENT



CANDIDATE B
PARTY X



CANDIDATE C



CANDIDATE D
PARTY Z



CANDIDATE E INDEPENDENT

Exit without voting

Cast vote



Voting Process Confirmation

Step 3 of 4

You have selected the following candidates. Please, confirm or go back and change your vote

Candidate selected



CANDIDATE D
PARTY Z

Change vote

Confirm vote



Voting Process Voting receipt

Step 4 of 4

VOTING RECEIPT

Your vote has been recorded correctly. Please keep the following information in order to verify that your opinion was counted correctly.

Vote identifier: a3ij-lo20-kdo2-900d

Control code: D9=okdj0ilakoe+aj9eda=jeoksoe3

kosnooeowlañ78kdo23903+ndi2k=

Save Print Exit



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Conclusion

- E-voting is an emerging market with tremendous growth potential worldwide.
- The introduction of e-voting in a country requires the execution of some pilots to test its feasibility.
- Any e-voting system must be accessible, user-friendly, available and trustworthy. Special security measures are required to ensure the required trust.
- HP & Scytl are leading providers of secure e-voting solutions working worldwide to help governments in this field, from pilots to extensive rollouts. They have extensive experience and the best set of e-voting solutions.





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