



TIVI Verifiable Online Voting

Accessible, Anytime, Anywhere

Increased voter participation and election credibility via secure, verifiable online voting for government elections

In 2016, the Smartmatic-Cybernetica Centre for Excellence for Internet Voting introduced the next generation version of their online solution called TIVI.

TIVI is a convenient and secure online voting solution allowing governments to connect with their remote voters by providing them with a transparent, accessible and universally verifiable platform. This guarantees voters and governments the integrity of all cast ballots, ultimately leading to increased participation rates and election credibility.

Benefits

Integrity Guaranteed



TIVI is the only online voting solution in the world that offers universal digital verifiability providing demonstrable proof that votes were cast as intended, stored as cast, counted as cast.

Voters can verify the integrity of their vote using a Blockchain-based public bulletin board. Zero-knowledge mathematical proofs can be used to verify the correct operation of core voting processes including cryptographic mixing and decryption.

Enhanced Electoral Transparency



We strongly advocate the use of third party independent authorities as a mechanism of enhancing public trust in any automated election.

The source code can be reviewed by independent security and accreditation experts making TIVI fully available for auditing by the electoral authorities or any approved third-party authorities.

TIVI's system components register all system transactions performed during the entire electoral process. System logs are cryptographically protected to ensure their integrity. Also, privacy preserving mathematical proofs are created, which verify the correct operation of the mixing and decryption processes whilst maintaining voter privacy and vote secrecy.

Accessibility Compliance



With TIVI, we bring the ballot to the voter thereby supporting the convenience focused lifestyles of the modern citizen. As TIVI offers native support for any modern Internet enabled device (desktop, laptop, tablet, mobile) voters are allowed to cast their ballot from any location globally.

Furthermore, TIVI seamlessly integrates with audio browsers (e.g. JAWS, NVDA) and hardware peripherals (e.g. switches, paddles, 'sip-puff' tube) and is WCAG compliant, embracing the requirements of voters with disabilities allowing for independent voting.

Voter Eligibility Assured



Our solution been designed to offer a variety of strong authentication methods, which accurately verify the identity of the voter and only permit eligible voters to access the system and successfully cast their ballot. TIVI supports multiple simultaneous access and strong authentication mechanisms including eID, mobile ID, smartphone based 'two-step' verification and biometric access. Also, the solution includes a unique mechanism that allows the voter's identity to be verified with a 'selfie', combining registration, authentication and voting in one device, assuring voter eligibility.

Voter Coercion Potential Minimized



The potential of voter coercion can be eliminated by 'multi-session' voting. TIVI offers multi-session voting to allow the voter to cast a ballot as many times as they wish, with each newly cast ballot superseding the previous ballot to maintain the principle of 'one person, one vote'.

Ballot Secrecy Maintained



Votes are encrypted and digitally signed on the voter's device. This is often referred to as a digital 'double-envelope' scheme and when utilized along with strong transport layer security (TLS) between the voter's computer and the vote receiving server (digital ballot box), the ballot is securely protected.

Vote Marking Errors Reduced



Errors are reduced and spoiled/invalid ballots are eliminated with the intuitive, responsive UI/UX.

Easy to understand user interfaces eliminate voter error and create a consistently simple user experience across all devices (laptop, tablet, mobile).

Vote Privacy Ensured



Our online voting system has been designed to ensure 100% voter privacy at every stage of the election process. At no stage can voter preferences ever be correlated with a voter's identity. Cast votes are cryptographically mixed to destroy any correlation with the order in which they were cast and to maintain voter anonymity. This takes place on a 'clean', air-gapped decryption server, which has never been connected to the Internet.

The voter needs an Internet enabled computer, laptop, tablet or smartphone and run the official voting application.

The voter logs in to TIVI, authenticates oneself with an ID and unique PIN after which a choice can be made and the vote can be cast.

To protect vote integrity, TIVI automatically encrypts and digitally signs the vote on the voter's device using advanced cryptographic techniques.

The vote is then sent through an encrypted channel to the secure vote server and the voter receives a unique voting receipt, which can be used later to verify the vote via a smartphone application and through a public bulletin board.

How Does TIVI Work?

Finally, the votes are decrypted and counted only in the presence of the electoral board who needs to come together to create the decryption key - this way, no individual has exclusive access to the decrypted votes and no preliminary results can be leaked.

At the close of the election the encrypted votes are sent through a cryptographic mixing process which digitally shuffles the votes, so no one but the voter knows who has been voted for.

