eVS-IITK Proposal

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Proposal for a secure online voting system

1. Current platform: VS-3

1. VS-3 is used for every election. It was written in 2014-15, and has been passively maintained by me and Kunal Kapila over the years.
2. Requires non-trivial amount of changes per election, and some editing of code. Its final program has to be built and copied onto EC members' laptops before the election.
3. Requires traditional form of booth-voting.
4. Voter turnout is quite low.
5. Works quite reliably, but requires a significant amount of testing before final build, since the code requires multiple changes every time.

2. eVS Proposal

A cryptographically secure electronic voting system is being proposed here, which takes into account the requirements of a high-tension election, while ensuring high voter turnout. Along with that, it provides voters an opportunity to make a more informed choice. It shall be modelled as a web application which can be used from any location by the voters.

As sufficient real-world testing is required for any software before deployment, it is recommended that this be used for general elections only after proper testing in the HEC / By-elections.

2.1. Overview of proposed features:

1. Users can access a web application to cast their vote from their room.
2. Vote can be changed any time till the end of the voting period.
3. Candidates can be allowed to write a small message (a closing statement, if agreed by the senate, perhaps 400 characters) to be published on the voting page, to allow users to read their proposals / refresh their memory before casting a vote. This is not practical in a booth system due to time constraints.
4. User must authenticate using CC login. Alternatively, we can scan ID card bar code for extra layer of security.
5. Creating new polls can be simply done by the admin account of the CEO, and selecting the allowed batches.

2.2. Security features

1. A cryptographic algorithm which ensures that no one (not even the server admin) knows which person a student has voted for.
2. Ability to record audio / video while casting vote to store proof in case of manipulation of voters.

2.3. Addressing security concerns

1. **Manipulation of voters:**
   The ability to change votes almost completely solves this issue. If some person forces a student to vote for a particular candidate, the student can open up the website immediately after the person leaves, and change the vote according to his wish.
● **Manipulation of voters during the ending time of the election:**
   The above argument fails if someone is manipulated right before the end of the election. To control that, the EC members who used to controlled the booth shall now patrol the hall right before the election ends, to ensure fair elections.
2. **Leaking of information of votes**
   Anonymous voting, and cancellation of the votes is possible due to the algorithm. The technical details can be presented on request. We plan to keep the algorithm and the platform open source to encourage confidence in the system.

3. Comparison of the two systems

● **Voter turnout**
   This should see a significant increase in the turnout since voters can now vote from any location without standing in a line. It would also work via mobiles. If the senate agrees, we can also allow voting from outside IITK, eliminating the need of envelope voting. Otherwise, the website will only be available internally.
● **Informed voting**
   The availability of the candidate manifestos on the portal should encourage informed voting. This was not possible in traditional systems due to time constraints on the election booth.
● **Reduction of EC workload**
   The set-up and the booth maintenance time both will be reduced by eVS. A new election can be started by the EC easily.
● **Overhead of obtaining laptops for booths**
   This issue has been recognised and is encountered every election. Laptops need to be acquired and cleaned up by formatting (current solution in practice), which is a big hassle.