

E-Voting and the Need for Rigorous Software Engineering – The Past, Present and Future

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Abstract. In many jurisdictions around the world, the introduction of e-voting has been subject to wide-ranging debate amongst voters, politicians, political scientists, computer scientists and software engineers. A central issue is one of public trust and confidence: should voters be expected to put their faith in “closed” electronic systems where previously they trusted “open” manual systems?

As the media continues to report on the “failure” of e-voting machines, electoral administrators and e-voting machine manufacturers have been required to review their policies and systems in order to meet a set of ever changing requirements. Such an unstable problem domain stretches their understanding of the electoral process and their ability to apply a diverse range of technologies in providing acceptable electronic solutions. The breadth and depth of the issues suggest that no electoral administration can justifiably claim to have implemented a “trustworthy” electronic replacement for a paper system.

All e-voting systems rely substantially on the correct functioning of their software. It has been argued that such e-voting software is “critical” to its users, and so one would expect to see the highest standards being applied in the development of software in e-voting machines: this is certainly not the case for machines that have already been used. Furthermore, in jurisdictions where e-voting machines have just been procured we shall see that the software in these machines is often of very poor “quality”, even though it has been independently tested and accredited for use.

Throughout the presentation we will focus on the software engineering issues, and will consider the question of whether the formal methods community could have done more - and should do more - to help alleviate the costly problems that society is facing from badly developed software in a wide range of critical government information systems (and not just voting machines).