

Blockchain-based e-voting systems:

Legal challenges exemplified by German law

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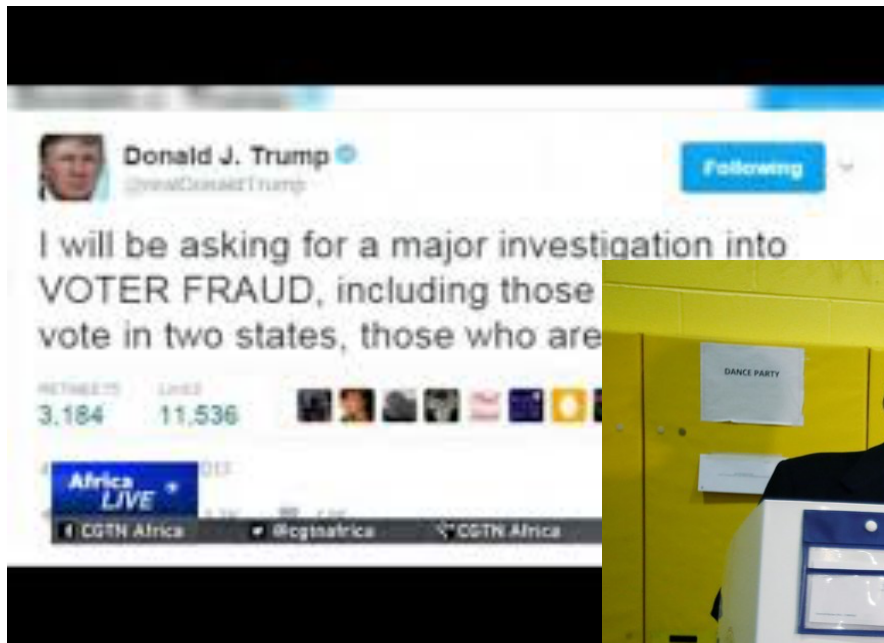
Agenda

1	Introduction
2	Blockchain-based e-voting systems
3	Legal framework in Germany
4	Discussion
5	Summary/Outlook

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Voter fraud hits the news



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www.europarl.europa.eu/RegData/etudes/ATAG/2016/581918/EPRS_ATA(2016)581918_EN.pdf


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At a glance


Scientific Foresight: What if ...?



What if blockchain technology revolutionised voting?

Is blockchain the revolution in security and transparency that is needed to enable e-voting and, if so, what are the implications for the future of democracy?

Despite the digitalisation of several important aspects of modern life, elections are still largely conducted offline, on paper. Since the turn of the century, e-voting has been considered a promising and (eventually) inevitable development, which could speed up, simplify and reduce the cost of elections, and might even lead to higher voter turnouts and the development of stronger democracies. E-voting could take many forms: using the internet or a dedicated, isolated network; requiring voters to attend a polling station or allowing unsupervised voting; using existing devices such as mobile phones and laptops, or

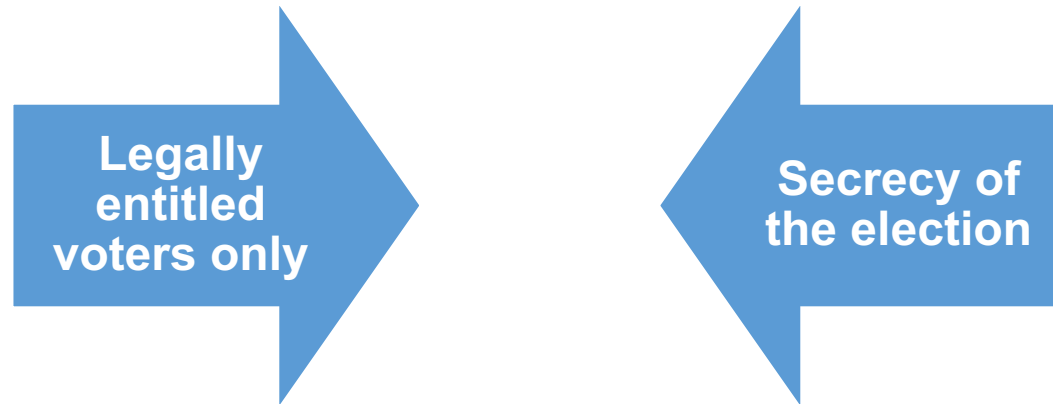


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Blockchain-based e-voting systems

Main Characteristics

- Two conflicting demands



- “Follow my vote”: separated registrars and ID-verifiers
- Use of anonymous voter –ID’s to ensure secrecy of the election
- Can be used on fixed computers and mobile devices

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Legal framework in Germany

Art. 38, paragraph 1 Grundgesetz

«Members of the German Bundestag shall be elected in
general, direct, free, equal and secret elections.

They shall be representatives of the whole people, not bound by orders or
instructions, and responsible
only to their conscience.»

- Additional criterion: Publicity of the election
- 2009: Judgment of the Constitutional Court regarding “Nedap” voting machines
- Concretisation by § 35 Bundeswahlgesetz

Legal framework in Germany

§ 35 Bundeswahlgesetz

(1) **Voting machines** may be used instead of ballot papers and ballot boxes to facilitate the casting and counting of votes.

(2) Voting machines as defined in subsection (1) above must guarantee the **secrecy of the ballot**. For use at elections to the German Bundestag, their **design must be officially approved** for individual elections or on a general basis. The Federal Ministry of the Interior shall decide on the approval of a voting machine on the application of the manufacturer. The permission of the Federal Ministry of the Interior must be obtained before an officially approved voting machine can be used. This permission may be given for individual elections or on a general basis.

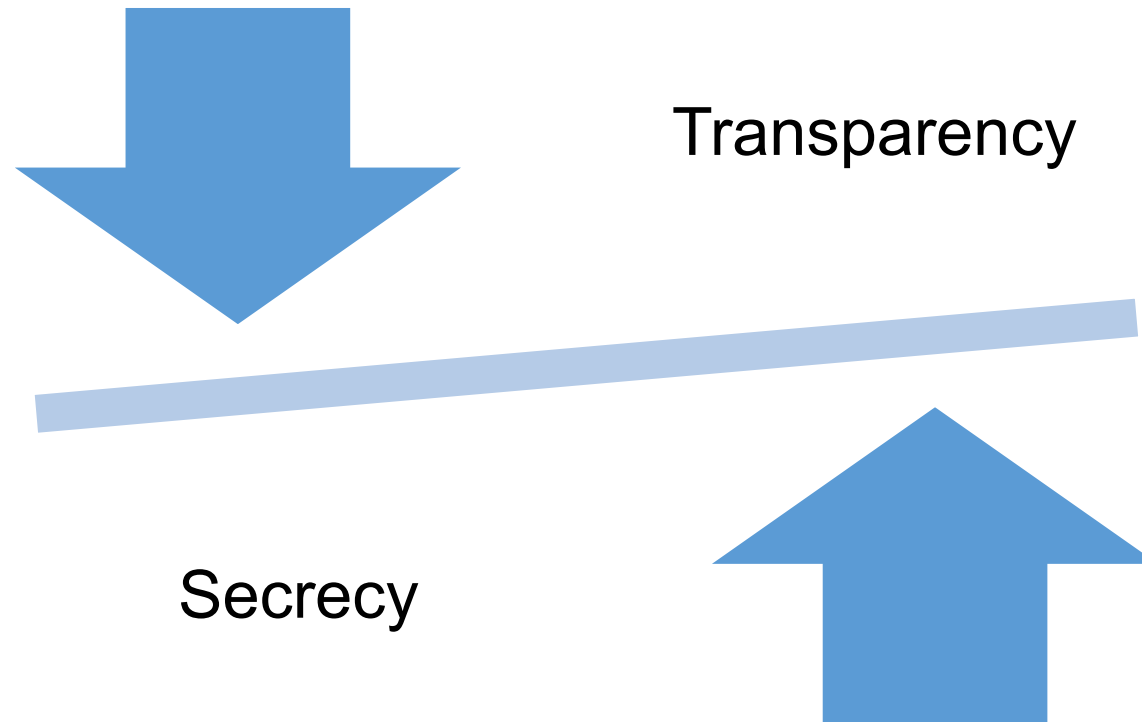
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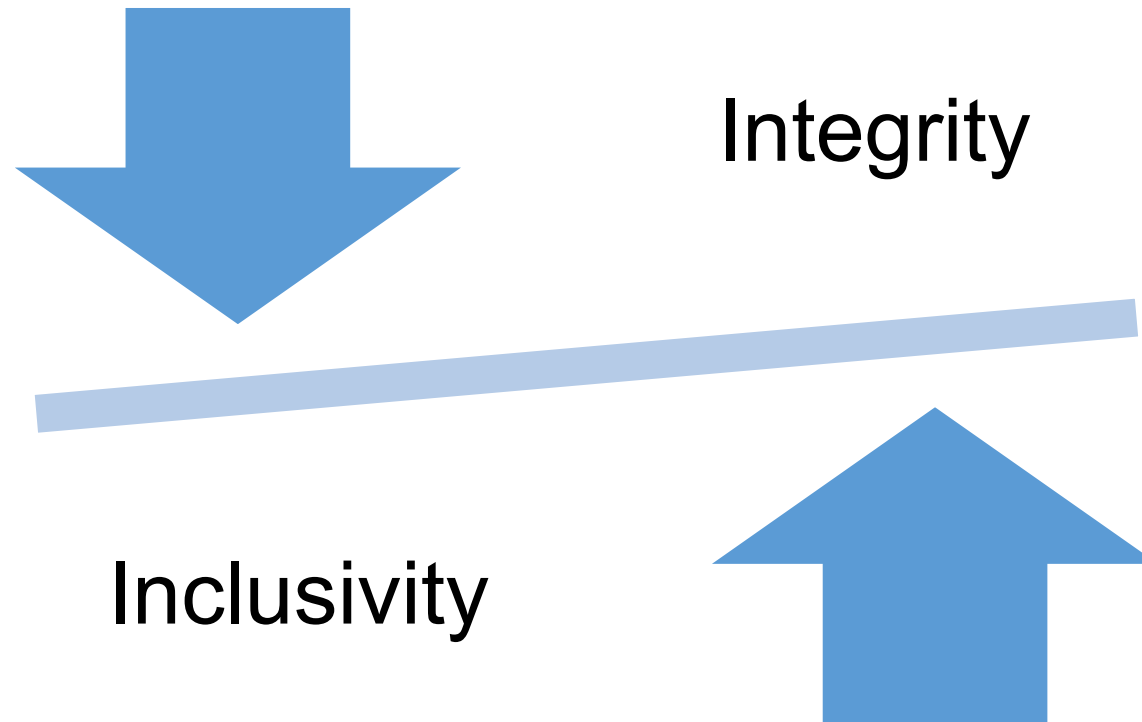
Legal frameworks

The main challenge 1: Balancing transparency with secrecy



Legal frameworks:

The main challenge 2: Balancing inclusivity with integrity



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High transparency and integrity, low inclusivity and no secrecy



High inclusivity, medium transparency and low integrity



High transparency and integrity, low inclusivity and no secrecy



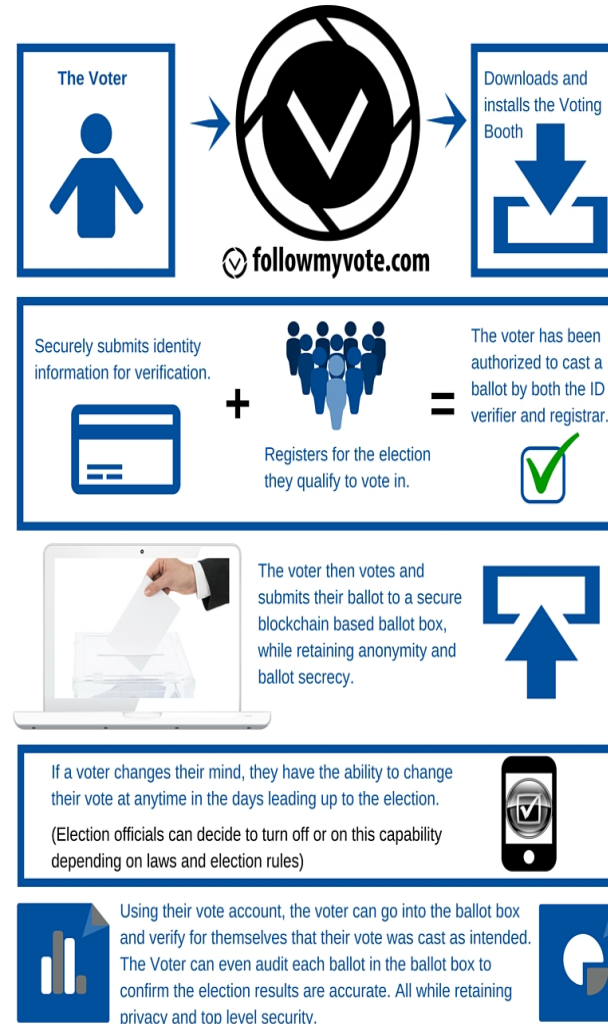
The role of cryptography



Example: Followmyvote

Blockchain Voting

— THE FOLLOW MY VOTE WAY —



Beyond transparency and secrecy

- The problem of early voting and political disengagement.
- Changing your vote once it was cast
- Incentivizing public participation in the political process

