Blockchain

Blockchain polling with Etherium smart contracts and NFTs.

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Context of use: Education
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Impact on society

What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?

The core problem is the lack of transparency, security, and trust in traditional voting systems, which are vulnerable to tampering, fraud, and manipulation. This undermines public confidence in electoral outcomes and can lead to decreased voter participation and legitimacy issues. Yes, this is a significant problem, as fair and trustworthy voting mechanisms are essential for democratic processes and organizational decision-making.

Are you sure that this technology is solving the RIGHT problem?

Yes, we are confident that the technology addresses a critical issue in voting systems: the lack of transparency, security, and trust. By leveraging blockchain's immutable and decentralized nature, it directly tackles these problems, which are fundamental to democratic processes and organizational governance.

How is this technology going to solve the problem?

The technology provides a secure, transparent, and tamper-proof voting platform using blockchain smart contracts. It records all voting transactions immutably on the Ethereum blockchain, ensuring votes cannot be altered or manipulated. Smart contracts automate the voting process, enforce eligibility criteria, and transparently finalize results, restoring trust and integrity in the voting process.

What negative effects do you expect from this technology?

Potential negative effects include:

Technical Barriers: Users unfamiliar with blockchain may find participation challenging.
Access Inequality: Those without reliable internet or devices may be excluded.
Privacy Risks: Improper data handling could expose personal information.
Security Vulnerabilities: Flaws in smart contracts might be exploited.
Regulatory Challenges: Navigating international laws can be complex.

In what way is this technology contributing to a world you want to live in?

The technology fosters a world that values transparency, trust, and democratic participation. It empowers individuals to directly influence decisions, promotes accountability, and strengthens democratic institutions,

leading to more engaged and informed societies.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

Implement off-chain data storage to protect personal information and comply with privacy regulations.
Foster a strong community to encourage user engagement and trust.
Promote voting on specific topics rather than traditional political parties to enhance direct democracy.
Enhance blockchain security by adopting a more secure and scalable blockchain platform.

Hateful and criminal actors

What can bad actors do with your technology?

In which way can the technology be used to break the law or avoid the consequences of breaking the law?

The technology could be misused by enabling unauthorized voting, where individuals participate without proper eligibility, potentially influencing outcomes illegally. Smart contract vulnerabilities might be exploited to alter results or steal tokens, constituting fraud. The anonymity of blockchain could facilitate unlawful activities without easy traceability, and improper handling of personal data could lead to violations of privacy laws like GDPR.

Can fakers, thieves or scammers abuse the technology?

Yes, if security measures are inadequate, malicious actors could:

Exploit Smart Contract Flaws: Manipulate results or steal tokens.
Conduct Phishing Attacks: Steal user credentials or private keys.
Perform Sybil Attacks: Use fake identities to sway outcomes.
Gain Unauthorized Access: Breach administrative controls.
Robust security protocols and user education are essential to mitigate these risks.

Can the technology be used against certain (ethnic) groups or (social) classes?

If not designed inclusively, the technology could:

Exclude Underprivileged Groups: Due to the digital divide.
Implement Biased Criteria: Unintentionally discriminate via eligibility settings.
Language Barriers: Limit access for non-native speakers.
Ensuring fair access and inclusive design is crucial.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.

They might:

Spread Misinformation: Legitimize false narratives through fake polls.
Inflame Tensions: Create divisive polls targeting specific groups.
Misuse Data: Leak personal information to incite conflict.
Content moderation and data protection measures are needed to prevent this.

How could bad actors use this technology to subvert or attack the

truth?
Bad actors could:

Manipulate Vote Counts: Falsify results to misrepresent public opinion.
Impersonate Authorities: Deceive users with fraudulent polls.
Undermine Trust: Highlight vulnerabilities to discredit the system.
Strengthening verification and security is vital to maintain integrity.

Now that you have thought hard about how bad actors can impact this technology, what improvements would you like to make? List them below.
Adopt a more secure Layer 0 blockchain to strengthen foundational security against attacks.
Conduct regular security audits of smart contracts to identify and fix vulnerabilities.
Implement robust identity verification to prevent unauthorized access and fraudulent voting.
Establish governance protocols to handle malicious activities effectively.

Privacy

Are you considering the privacy & personal data of the users of your technology?

Does the technology register personal data? If yes, what personal data?

Yes, the technology registers personal dataincluding name, email, and agethrough the UserRegistration smart contract. Currently, as a proof of concept, this data is stored on the blockchain, which raises privacy concerns due to blockchain's immutable nature. In a production environment, personal data should be stored off-chain to comply with data protection regulations and safeguard user privacy.

Do you think the technology invades the privacy of the stakeholders? If yes, in what way?

Yes, storing personal data on-chain without safeguards invades privacy, as blockchain data is public and immutable. This could expose stakeholders' personal information to unauthorized parties, leading to privacy breaches.

Is the technology is compliant with prevailing privacy and data protection law? Can you indicate why?

Currently, storing personal data on-chain is not fully compliant with laws like GDPR, which require data to be erasable and correctable. To achieve compliance, personal data should be stored off-chain in secure, encrypted databases, allowing for data management in line with legal requirements.

Does the technology mitigate privacy and data protection risks/ concerns (privacy by design)? Please indicate how.

Yes, by:

Using Off-Chain Storage: Securing personal data in encrypted databases.
Implementing Data Minimization: Collecting only necessary information.
Anonymizing On-Chain Data: Using pseudonyms to protect identities.
Enforcing Access Controls: Restricting data access to authorized personnel.
Obtaining User Consent: Informing users and getting permission for data use.

In which way can you imagine a future impact of the collection of personal data?

Potential future impacts include:

Data Breaches: Leading to identity theft or fraud.
Unauthorized Profiling: Misuse of data for targeting or discrimination.

Loss of Privacy: Advanced techniques could de-anonymize users.
Legal Repercussions: Non-compliance may result in fines or sanctions.
Robust data protection is essential to prevent these outcomes.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

Store user data off-chain in secure, encrypted databases to safeguard personal information.
Enhance data encryption and access controls to prevent unauthorized data access.
Ensure compliance with data protection laws like GDPR.
Provide transparent privacy policies to inform users about data handling practices.

Human values

How does the technology affect your human values?

How is the identity of the (intended) users affected by the technology?

The technology affects users by providing greater control and confidence in the voting process, enhancing civic engagement. However, storing personal data on the blockchain can expose users to privacy risks since blockchain data is immutable and publicly accessible. This could impact how users perceive their digital identity and may make them vulnerable if personal information is not adequately protected.

How does the technology influence the users' autonomy?

It enhances autonomy by:

Enabling Direct Participation: Users engage without intermediaries.
Providing Control Over Votes: Users can adjust votes until polls close.
Offering Transparency: Users make informed decisions with full process visibility.
However, complexity may hinder autonomy if not addressed through user-friendly design.

What is the effect of the technology on the health and/or well-being of users?

Positive effects:

Boosted Civic Engagement: Enhances sense of community and purpose.
Increased Trust: Alleviates anxiety over corrupt systems.
Negative effects:

Technical Stress: Users may feel overwhelmed by complexity.
Privacy Concerns: Worry over data security could cause stress.
Improving usability and privacy measures can enhance well-being.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.

Enhance user empowerment by simplifying the user interface and experience.
Promote inclusivity and accessibility for users of all abilities and backgrounds.
Uphold ethical standards by integrating guidelines that respect human dignity and autonomy.
Encourage civic engagement by educating users on the importance of

participation.

Stakeholders

Have you considered all stakeholders?

This category is only partial filled.

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder
Voters (Individuals)

How is this stakeholder affected?
Gaining a secure platform for voting but may face access or technical challenges.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Poll Creators (Organizations)

How is this stakeholder affected?
Access to a reliable system for conducting polls; need to understand setup processes.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Government Bodies

How is this stakeholder affected?
Potential adoption for official elections; require legal compliance.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
NGOs and Civic Organizations

How is this stakeholder affected?
Enhanced community decision-making tools; need user-friendly interfaces.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Developers and Technologists

How is this stakeholder affected?
Responsibility for development and maintenance; need clear documentation.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Regulatory Authorities

How is this stakeholder affected?
versight of compliance; require transparency and cooperation.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
General Public

How is this stakeholder affected?

Indirect effects on society; public perception is important.

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?
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Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.
Engage stakeholders through consultations to address their needs and concerns.
Collaborate with regulatory authorities to ensure compliance and build trust.
Offer educational resources and support to help stakeholders understand the technology.
Create transparent policies to manage conflicts of interest and ensure fairness.

Data

Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

Yes, we are aware of data pitfalls such as bias, privacy risks, security vulnerabilities, and incomplete data collection. We address these by minimizing on-chain personal data, encrypting off-chain storage, implementing validation mechanisms for data integrity, and designing the system to be accessible and inclusive. We adhere to data protection regulations and employ best practices to mitigate these issues.

How does the technology organize continuous improvement when it comes to the use of data?

By:

Conducting Regular Audits: Ensuring data practices are up-to-date.
Implementing User Feedback Loops: Addressing issues identified by users.
Updating Systems: Applying patches and improvements promptly.
Monitoring Compliance: Staying aligned with evolving regulations.

How will the technology keep the insights that it identifies with data sustainable over time?

Through:

Data Governance Policies: Clear guidelines for data use and retention.
Scalable Infrastructure: Supporting growth without loss of performance.
Adoption of Open Standards: Ensuring long-term compatibility.
Community Engagement: Keeping the technology relevant via user involvement.

In what way do you consider the fact that data is collected from the users?

We treat data collection with responsibility by:

Being Transparent: Informing users about data collection purposes.
Obtaining Consent: Ensuring users agree to data usage.
Limiting Use: Collecting only what is necessary for functionality.
Securing Data: Protecting against unauthorized access.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them

below.

Implement data validation mechanisms to improve accuracy and integrity.
Mitigate data bias by encouraging diverse participation and fair token distribution.
Enhance transparency while protecting privacy through anonymization techniques.
Regularly audit data practices to maintain high standards of data management.

Inclusivity

Is your technology fair for everyone?

Will everyone have access to the technology?

Not immediately, due to:

Digital Divide: Limited access for some populations.
Technical Literacy Requirements: Potential barriers for non-tech-savvy users.
Efforts will focus on reducing these barriers through design and outreach.

Does this technology have a built-in bias?

Potential biases include access inequality, as users require internet access and technical literacy, potentially excluding certain populations. Eligibility criteria set by poll creators might unintentionally discriminate against specific groups. Unequal token distribution could give disproportionate influence to certain users. To mitigate these biases, the system emphasizes inclusive design, fair eligibility conditions, and equitable token distribution.

Does this technology make automatic decisions and how do you account for them?

Yes, via smart contracts for:

Eligibility Checks
Vote Finalization
These are transparent and based on code available for public review, ensuring accountability.

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?

Currently, benefits may skew towards technologically equipped users, which is a concern. Addressing accessibility and education is vital to prevent widening inequalities.

Does the team that creates the technology represent the diversity of our society?

No, as a solo developer, diversity is lacking. Expanding the team to include diverse perspectives is important to avoid biases and better serve all users.

Now that you have thought hard about the inclusivity of the

technology, what improvements would you like to make? List them below.

Design for universal accessibility to accommodate users with disabilities.
Simplify the platform to cater to varying levels of technical literacy.
Provide multilingual support to reach a global audience.
Ensure equitable access by considering solutions for users with limited resources.

Transparency

Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?

Yes, detailed technical documentation, user guides, and transparent explanations of the system's architecture and smart contracts are provided. The business model is communicated clearly, including any associated costs or fees. Open-source code and transparent operations help stakeholders understand and trust the platform.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

Yes, decisions are made via open-source smart contracts. Users can review the code and access documentation explaining the logic behind algorithmic decisions.

Is it possible to file a complaint or ask questions/get answers about this technology?

No

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

No

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

Open-source the platform to allow for public review and increased trust.
Offer clear documentation and tutorials to explain system operations.
Implement transparent governance models for decision-making processes.
Provide real-time auditing tools for users to verify transactions and outcomes.

Sustainability

Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?

Energy consumption is considered by utilizing Ethereum's Proof-of-Stake consensus mechanism, which is more energy-efficient than Proof-of-Work. Smart contracts are optimized for efficiency to minimize computational resources. The project explores Layer 2 solutions to reduce the load on the main blockchain and educates users about environmental impacts, promoting responsible usage.

Do you think alternative materials could have been considered in the technology?

While digital, using more energy-efficient hardware and promoting renewable energy for running nodes can reduce environmental impact.

Do you think the lifespan of the technology is realistic?

Yes, provided continuous updates and maintenance are performed to keep pace with technological advancements and security needs.

What is the hidden impact of the technology in the whole chain?

Hidden impacts include:

Energy Consumption: Total energy used by network participants.
E-Waste: Disposal of outdated hardware.
Supply Chain Issues: Environmental effects from manufacturing devices.
Addressing these requires sustainable practices throughout the technology's lifecycle.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

Optimize code for energy efficiency to reduce environmental impact.
Utilize energy-efficient blockchain technologies or Layer 2 scaling solutions.
Promote sustainable practices among users and developers.
Monitor environmental footprint to identify and address sustainability issues.

Future

Did you consider future impact?

What could possibly happen with this technology in the future?

The technology could see broader adoption by governments and organizations for official voting, enhancing democratic processes. Technological advancements may improve scalability, security, and user experience, making it more accessible. Regulatory changes could impact operations, requiring adaptability. Integration with digital identity systems might enhance verification, and ongoing security updates will be necessary to counter evolving threats.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.

Utopian Scenario:

By 2045, blockchain voting has revolutionized democracy. Global adoption ensures transparent governance, with citizens directly influencing policies. Technology bridges societal divides, and decision-making is more efficient and representative.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.

Dystopian Scenario:

In 2045, authoritarian regimes exploit the technology to simulate democracy while manipulating results. Personal data is weaponized for surveillance, and the public loses trust, leading to social unrest and fragmentation.

Would you like to live in one of this scenario's? Why? Why not?

I aspire to the utopian scenario, where technology enhances democracy and societal well-being. The dystopian outcome highlights the importance of ethical implementation to avoid such futures.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?

It could be repurposed unethically, compromising user trust and privacy. To prevent this, maintaining open-source status, decentralized control, and strong community governance is crucial to uphold ethical standards.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.

Plan for scalability to accommodate growing user bases without degrading performance.
Stay adaptable to legal changes by monitoring regulations and updating compliance.
Invest in continuous innovation to integrate emerging technologies and features.
Promote ethical development to ensure the technology benefits society responsibly.