

COMPETITORS

Eligo eVoting

Competitor's product: Eligo offers a secure online voting platform with features such as voter authentication, real-time results, and customizable templates for various types of elections and voting processes.

Market position: a well-established player in the digital voting industry since 1994, Eligo has served over 4,500 organizations and facilitated votes for more than 20 million individuals worldwide.

Similarities:

- Provides secure online voting solutions
- Offers customization options
- Ensures voter anonymity and data protection

Differences:

- Primarily focuses on organizational elections rather than government-level voting
- Does not utilize Zero-Knowledge Proofs for enhanced verifiability
- Offers integrations with collaboration tools like Microsoft Teams and Cisco Webex

Swiss E-Voting System

Competitor's product: the Swiss E-Voting System is a secure online voting solution with end-to-end encryption, complete verifiability, and voting secrecy, designed specifically for Swiss national and local elections.

Market position: a state-of-the-art solution tailored for the Swiss political system, complying with Swiss legal requirements. As of August 2023, it has been authorized for use in several Swiss cantons.

Similarities:

- Provides secure online voting
- Emphasizes verifiability and transparency
- Focuses on protecting voter privacy

Differences:

- Specifically designed for the Swiss political system
- Implements a "security before speed" principle
- Requires extensive public scrutiny and independent examinations

- Does not use Zero-Knowledge Proofs in the same way as our proposed system

Others

In addition to our proposed e-voting system, there are several other prominent players in the electronic voting market:

1. [Smartmatic](#): a global provider of election technology and services.
2. [Dominion Voting Systems](#): a North American company that produces electronic voting hardware and software, including voting machines and tabulators.
3. [Election Systems & Software \(ES&S\)](#): a major election equipment and services provider in the United States.

Our e-voting system offers a unique combination of security, privacy, and verifiability, addressing the challenge of election integrity verification without compromising individual vote secrecy. This sets it apart from both Eligo and the Swiss E-Voting System, potentially appealing to a broader range of elections, from organizational to government-level.

USER INTERVIEWS

User 1

Name: Aradi Miklós

Job: IT Security Architect

Structured talking:

1. Is the system useful and fit for the purpose?

Yes, if it will make what you mentioned, then it will be useful.

2. Is it easy and efficient to get things done with the system?

If it will be fast, and intuitive to use, then yes.

3. Is visually attractive UI is priority for you?

Not really a priority.

4. Can I identify myself with the product? Do I look good when using it?

If it will give us 100% anonymity, then yes, we as a company will look good using it.

5. Stimulation: Does the system give me inspiration? Or wow experiences?

I don't think a voting system should have this functions, so I don't understand the question.

6. Value: Is the system important to me? What is its value for me?

Anonymity, and if it can be open source that is also important to me.

Unstructured talking:

Goal:

I would use this product to vote about future plans in the company, and meeting votes.

Conclusion:

Needs anonymity.

Open source.

User2

Name: Kiss Jozsef

Job: Military colonel

Structured talking:

1. Is the system useful and fit for the purpose?

Yes, based on the description.

2. Is it easy and efficient to get things done with the system?

If it will be reachable everywhere, for many users in the country by a website, then yes.

3. Is visually attractive UI is priority for you?

It's not a priority.

4. Can I identify myself with the product? Do I look good when using it?

If we can find a voting system with anonymity, then yes.

5. Stimulation: Does the system give me inspiration? Or wow experiences?

Yes, I have ideas how I would use it in my daily life.

6. Value: Is the system important to me? What is its value for me?

To vote with anonymity is really important to me, and for managing a bigger userdatabase.

Unstructured talking:

Goal:

He would use it to vote across military camps.

Conclusion:

Anonymity is a must.

Data handling for big userbase is a must for him.

Website for easy access for computer/phone.

User3

Name: Aradi Jónás

Job: High School Teacher

Structured talking:

1. Is the system useful and fit for the purpose?

Yes, for classroom teaching and voting for e.g. trips. But I would like to request a function where we can vote with our names.

2. Is it easy and efficient to get things done with the system?

It would be really helpful to use this in the class. (he teaches middle and highschoolers)

3. Is visually attractive UI is priority for you?

Yes, when working with children, visuality is a priority. But “less is more”, nothing that would disrupt them.

4. Can I identify myself with the product? Do I look good when using it?

I can be a cool teacher if they can user their phones during classes.

5. Stimulation: Does the system give me inspiration? Or wow experiences?

Yes, the idea inspired me to think about other usecases.

6. Value: Is the system important to me? What is its value for me?

The value is to be reachable from a website, and easy usage for children.

Unstructured talking:

Goal:

He would use it for classroom votings with children.

Conclusion:

Needs function without anonymity for classroom votes.

Needs fast statistic function.

USER HYPOTHESES

Persona 1: Miklós Aradi



Background

- **Job Title:** IT Security Architect
- **Age:** 31
- **Location:** Hungary
- **Tech-Savvy Level:** High
- **Preferred Device:** Desktop/Laptop

Goals & Needs

- ✓ Ensure 100% anonymity in voting
- ✓ Prefer open-source for transparency and security
- ✓ Use the system for corporate decision-making and internal votes

Pain Points

- ✗ Concerned about data security and encryption
- ✗ Wants to prevent voter fraud and tracking

Technology Usage

- Prefers encrypted, secure systems over user-friendly interfaces
- Efficiency matters more than visual appeal

Key Quote

"If it guarantees 100% anonymity, we as a company will look good using it."

Persona 2: József Kiss

Background

- **Job Title:** Military Colonel

- **Age:** 56
- **Location:** Hungary
- **Tech-Savvy Level:** Medium
- **Preferred Device:** Desktop & Mobile

Goals & Needs

- ✓ Anonymous voting to ensure fairness
- ✓ Scalable for large user bases (military personnel)
- ✓ Web-based system accessible nationwide

Pain Points

- ✗ Concerned about handling large amounts of data securely
- ✗ Needs reliability under heavy usage

Technology Usage

- Prefers simple, web-based access over complex software
- Uses both desktop and mobile for flexibility

Key Quote

"To vote with anonymity is really important to me, and for managing a bigger user database."

Persona 3: Jónás Aradi



Background

- **Job Title:** High School Teacher
- **Age:** 73
- **Location:** Hungary
- **Tech-Savvy Level:** Medium-High
- **Preferred Device:** Mobile & Desktop

Goals & Needs

- ✓ Voting system for classroom decisions (e.g., trip planning)
- ✓ Named (non-anonymous) voting for student accountability
- ✓ Simple, visually engaging UI for students
- ✓ Fast statistical functions for result analysis

Pain Points

- ✗ Too much visual complexity distracts students
- ✗ Needs the system to be intuitive and easy to use

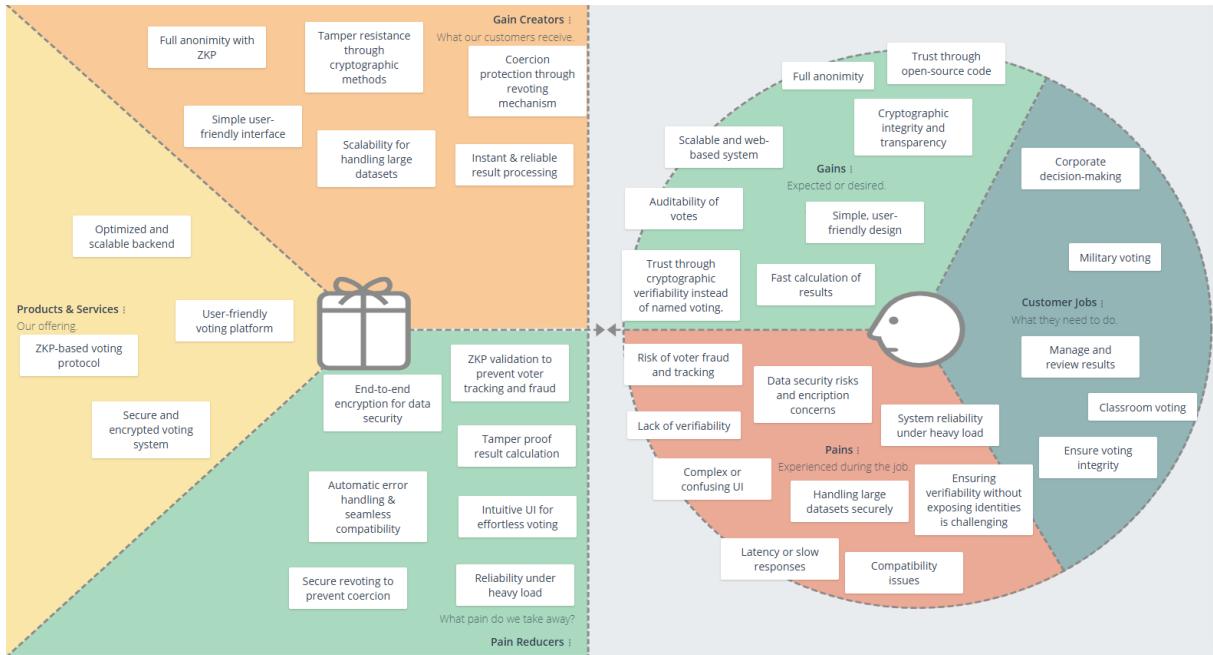
Technology Usage

- Uses both desktop and mobile for work
- Prefers simple, streamlined interfaces over feature-heavy systems

Key Quote

"I can be a cool teacher if they can use their phones during class."

VALUE PROPOSITION



Why choose our solution?

Unlike traditional e-voting systems that force users to choose between privacy and verifiability, our platform ensures both through Zero-Knowledge Proofs (ZKP) -- delivering full voter anonymity while maintaining cryptographic verifiability.

1. Privacy-first, yet fully verifiable

End-to-end encryption: Votes remain private and secure.

ZKP validation: Prevents fraud without tracking voter identities.

Coercion protection via revoting: If a voter is pressured, they can securely recast their vote, invalidating the previous one.

→ **Competing systems often require voter identities for verification or don't allow revoting.**

2. Reliable, scalable & tamper-resistant

Tamper-resistant vote processing: Cryptographic methods ensure results cannot be altered.

Optimized for large elections: Handles high traffic and massive datasets efficiently.

Automatic error handling & seamless compatibility: No crashes or failures.

Instant & reliable result processing: Eliminates delays in election outcomes.

→ **Many existing solutions lack scalability and transparency.**

3. Transparent & easy to use

Simple, intuitive interface: Designed for effortless voting.

Trust through open-source code: Fully auditable and transparent.

Seamless adoption: No need for specialized knowledge -- easy for both voters and organizers.

→ **Other cryptographic solutions tend to be complex or hard to adopt.**

USER STORIES

| AS an admin / administrator | | |
|---|-------|---|
| Create and manage elections, votes | GIVEN | the names of the candidates, their details and a deadline |
| | WHEN | voting creation is in progress |
| | THEN | voting is created |
| Add and remove candidates from the ballot | GIVEN | there are elections only to one group of people |
| | WHEN | the election is being set |
| | THEN | group verification is required |
| Set voting policies | GIVEN | every election is secured in some way |
| | WHEN | voting requires less or more security |
| | THEN | the admin can set the policies |
| Generate real-time reports (on voter turnout) | GIVEN | all the anonymous votes until a point in time |
| | WHEN | admin likes to generate real-time reports |
| | THEN | a diagram shows up with statistics |
| Manage voter registration and authentication | GIVEN | people in a group/country |
| | WHEN | a citizen likes to submit their vote |
| | THEN | admin can add user to a set of group |
| Audit the voting logs | GIVEN | all the anonymous votes until a point in time |
| | WHEN | admin suspects some malicious behaviour |
| | THEN | admin can see the log file generated by the votes |
| Extend / Modify deadline | GIVEN | the given election is already ongoing |
| | WHEN | there is a need for extension |
| | THEN | admin can modify the deadline, and also alert the users |
| Publish results | GIVEN | the election reached to an end |
| | WHEN | the results are verified and counted |
| | THEN | admin can publish the results |

| AS a user / voter | | |
|---|-------|---|
| Register for the election | GIVEN | a citizen / group of people like to vote in a poll |
| | WHEN | the poll is available |
| | THEN | user can register to vote |
| Receive clear instructions | GIVEN | the webpage containing the voting form |
| | WHEN | a user is not sure about the next step |
| | THEN | users can receive help on the webpage |
| Access the voting platform | GIVEN | a user is registered to the voting system |
| | WHEN | user would like to give their vote |
| | THEN | user chooses an option and sends their vote |
| View a list of candidates/answers and their information | GIVEN | there is a list about the options users can choose from |
| | WHEN | users would like to receive more information |
| | THEN | users can check additional information about the answers/candidates |
| Cast a vote | GIVEN | user knows who/what they want to vote on |
| | WHEN | the deadline is not reached |
| | THEN | users can cast their vote |
| Verify that the vote has been included in the final count | GIVEN | information panel about the individual voter |
| | WHEN | user does not remember whether they voted |
| | THEN | user can check if their vote has been included |
| Set the language of the page | GIVEN | a list of languages on the page |
| | WHEN | user does not understand a specific language |
| | THEN | user can change the language settings |
| Receive assistance in case of disabilities | GIVEN | there are options to help for different disabilities |
| | WHEN | user has some kind of disability |
| | THEN | user can set webpage accessibility settings on |
| Receive confirmation of vote | GIVEN | a vote has been submitted by the user |
| | WHEN | the vote is being recorded |
| | THEN | the webpage sends a confirmation pop-up |

| | | |
|------------------|-------|---|
| Vote anonymously | GIVEN | user is concerned about privacy |
| | WHEN | a user casts a vote |
| | THEN | the user's identity remains confidential |
| Report an issue | GIVEN | user wants to cast a vote |
| | WHEN | something unplanned happens during the vote |
| | THEN | users can report to the admin |