Epitome: An Online Direct Democracy Platform

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Abstract

The present document is a description of the features and functions of a direct e-democracy platform. The designed platform is open source, and flexible, allowing each society to tailor it to its needs. This platform aims to be a collection of numerous, out-of-the-box options and systems for societies to customize to their accord, and not a closed and final product. The primary focus of this article is the aspects that allow the platform to function without a representative body of government and not the features that already exist and have been extensively described in other e-governance systems, although some novel ideas are introduced. For this presentation, it is important to regard that all of the features and options in this system and all its subsystems are optional and configurable and can be activated or deactivated in each society as decided by the people.

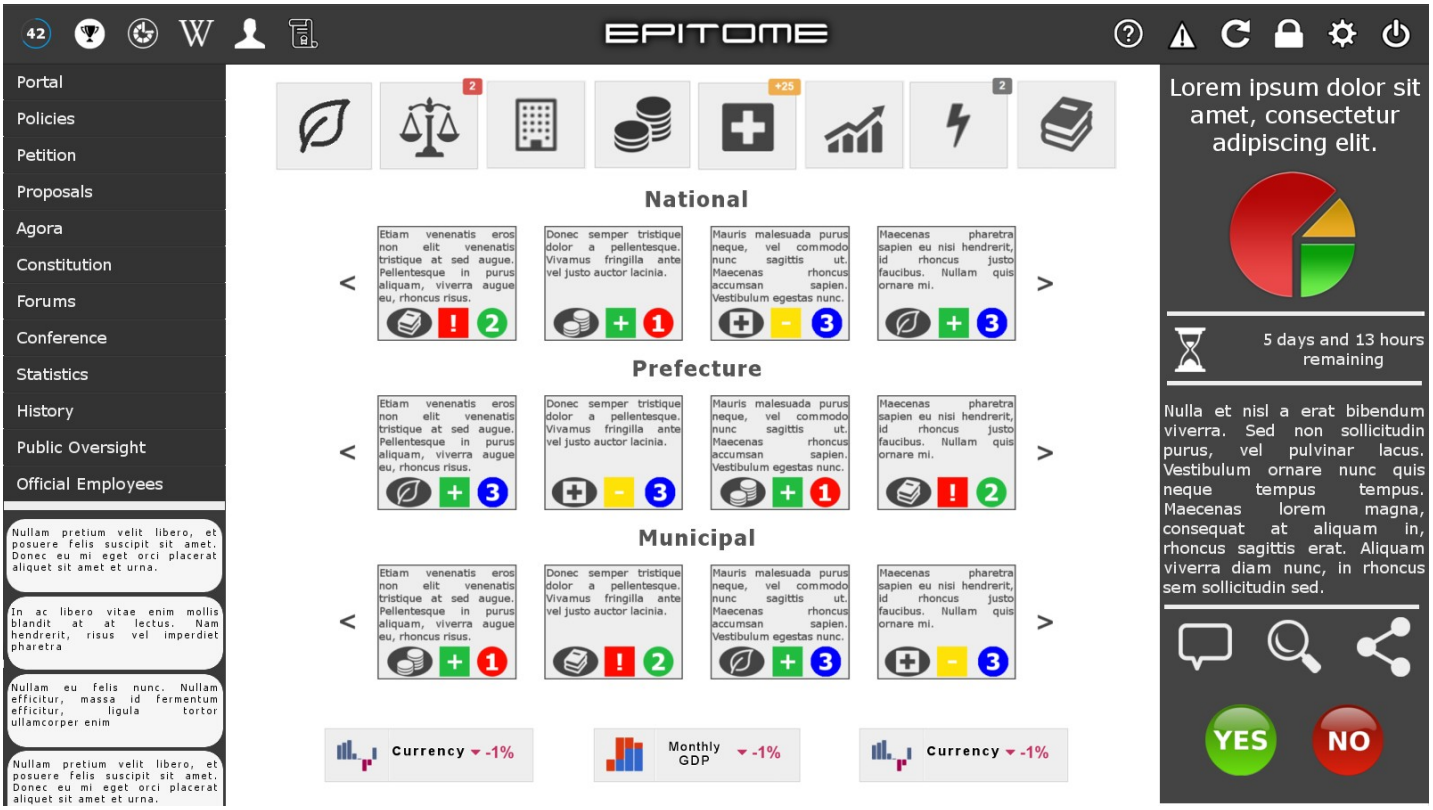

Figure 1: A Demonstration of the Platform

1. Features

Bellow are a set of features that are included by default in the system. A demonstration of some of the features can be seen on Figure 1.

1.1. Visual Interface

Apart from functionality, another objective of the platform is to provide the user with a pleasing and modern interface that is also responsive in different screen resolutions and touch-screen friendly for use in tablets or smartphones.

The theme of the interface is fully customizable and flexible to each user's preferences. Colors and size of each element are configurable. Additional visual themes will be available for individuals to choose among, although not everyone will be able to build or install a theme of their own due to security reasons, however new design ideas can be submitted.

Languages

The user is not restricted only to the language of his country of residence, but he can choose from any of the translations available, as he may be not an indigenous member of the population and is more comfortable using another language.

1.2. Social Integration and Gamification

Integration with major social networks would allow users to collaborate and share the proposals they support with their contacts. This could deal with political apathy to some extend.

Gamification

A gamification system could serve as extrinsic motivation for the youth population to increase the attendance until participation in the system itself would serve as intrinsic motivation. Every action within the system would be rewarded to promote familiarization, and to inform the users of their total contribution to the progress of their society.

1.3. Ease of Access

Ease of access features include a narrator, magnified text, and colorblind mode for people with special needs. The somewhat restricting facilities of today’s voting locations will no longer constitute an obstacle in one’s right to participate in the democratic process. In this system, even people with conditions that restrict them from leaving their house are possible to participate.

1.4. Graphs and Statistics

Citizens will be able to obtain statistical information about each referendum. Information such as number, age, gender, and location of the voters on each referendum will be displayed in graphs including what those citizens voted and the time they casted their votes. This information is intended to

make citizens more knowledgeable of their society's patterns and behavior.

1.5. Sidebar

Upon clicking a proposal a sidebar emerges from the side with information on the selected item. The title, description, and the time remaining is displayed. Additionally the user has the option to see a detailed description of the proposal, comment, share or directly vote from the sidebar. This way the user won't have to transition to a new page every time he would like to see information of a proposal, but he will be able to operate the platform from a single, interactive page.

2. Functions

The following is a description of some of the subsystems that support the operation of the platform. Those functions are fully configurable and societies will have the option to vote on the configuration of their platform.

2.1. Zones

Upon entering the platform there are 3 sliders in the landing page which display the ongoing proposals. Each slider displays a collection of proposals from the three region zones of the citizens:

1. Nation
2. Prefecture
3. Municipality

By default, citizens will have the opportunity to participate in the solution of issues only in the zones they belong. However, a society can decide if citizens are able vote for any subject in any region, even if they do not live there.

Tyranny of the Majority

Selecting the option of not allowing people to vote on the proposals of another region could also deal with the phenomenon known as “the tyranny of the majority” or “ochlocracy” to some extend, although other implications do emerge.

2.2. Categories

Proposal categories serve to sort out proposals based on their subject. Categories and the policy subjects they include are the following:

- **Culture –** Education, Sports, Culture, Religion, Science
- **Environment –** Environmental Issues, Energy, Maritime Affairs, Agriculture, Farming, Wildlife
- **Welfare –** Healthcare, Welfare, Rehabilitation
- **Economy –** Economy, Finance, Tax, Labor Laws, Industry

- **Diplomacy –** Foreign Affairs, Tourism, Trade
- **Order –** Army, Police, Firefighting, Rescue and Emergency Services, National Security
- **State –** Employment, Interior Affairs, Immigration Management, Justice, Law, Public Administration, Platform
- **Development –** Transport, Networks, Physical Planning, Housing, Public Works, Constructions

Upon logging in, users will be informed via number indicator on top of the category as seen in Figure 1 about the current proposals that are available for voting.

2.3. Status

Displayed proposals in the slide bars have small icons underneath indicating their importance and status.

Importance

Each voting will have an assigned importance such as “low”, “medium” or “high” to display the urgency on a conclusion. This importance is determined by the average importance assigned to the proposal by the people.

Status

Status displays information such as “needs more voters”, “ending soon”, “normal” etc, allowing the voters to understand the condition of each proposal with a glance.

2.4. Proposal Tribunal

A system embedded in the platform functions as a tool for policy review by the citizens. Instead of depending on administrators to operate, supervise and moderate, the citizens themselves assist in the correct function of the system.

This will review proposals for explicit language, racism, spam and in general remove ill-intended submissions. In case of repeated abuse from some citizens, an intervention in the means of participation in discussion groups could be used, but this is an aspect to be decided by each society.

Not only this removes the danger of users with admin rights to abuse their power, but it serves as a feedback system towards the users that improves their judgment.

2.5. Voting

While voting is considered a simple procedure, the platform features some additional options that could be decided upon by each society, or their use could be selected separately in each proposal, by the people.

People are able to vote “Yes”, “No” or give a “White” vote. White voting is an additional information, though which people may seek to provoke thinking or protest.

Ranking Methods

In more complex referendums, such as different state budget allocation proposals, users may vote through a ranking system their preferences and the result will be decided through methods such as the First-past-the-post or more complex methods such as the Condorcet or the Borda. The option of the voting system will be chosen by the citizens who build the proposal.

Live Result Display

An additional option in a proposal is to display the results live, on a chart, that will instantly show changes during the referendum. If used however can raise implications such as voter bias upon viewing the current results prior to voting.

Forced Voting

Votes are able to change before the deadline of the proposal, dealing in some degree with the problem that arises with people that are threatened to vote by their environment and giving them the option to change their vote later on.

Polls

Separately from official proposal submissions, users will have the option through a different system, to host unofficial opinion polls that will feature more selections than a simple “Yes/No” answer, so as to give an informational feedback tool to individuals seeking to submit proposals.

Proxy Voting

Users will have the option to delegate their voting power to another member whom they trust to make an informed decision in their place. This decision can be altered any time and the delegatees may transfer their voting power, and all the voting powers delegated to them, further on to another party. While this is not direct democracy in itself, it may provide an important transitional step for societies.

2.6. Law Knowledge Base

This system will serve as a compendium of the existing votes in effect. Citizens will be able to navigate in an interactive environment that will feature the categories described in section 2.2, and through sub-menus, they will be able to view and learn the laws that are currently in effect, with the option to click the title of each element and view the entire legislation. This system will also feature a search engine where the users will be able to easily find the laws affecting their issue. Proposals that passed through referendums, will be automatically indexed in this system with full details and will additionally display the date that they will come in effect.

This could provide anyone within minutes a basic understanding of the laws of each society, with the option for a more in depth reading. This could be an important feature for people who would like to move for a time period to another country and need to learn the laws of that society.

3. Security

3.1. Integrated Functions

Log in

The system will feature an ordinary username and password login but it will also provide the possibility of logging in with a two-factor authentication such as with the use of a smartphone.

As an additional level of security, as the user will have to enter a 6 digit pin whenever he wants to vote on a proposal or access his account information from within the platform.

Bug Reporting

Users have the choice of instantly reporting a bug to administrators that could provide a means of intrusion or malfunction.

Automatic Logout

The system after a period of inactivity automatically logs the user out so as to prevent usage from unauthorized sources.

Email Confirmation for Unknown Locations

Logging from an unknown location based on the user's IP, requires an email confirmation to the user's personal email address (or subsequently the user's mobile phone via a text message).

Deny Account Access

If a user suspect that his login information has been stolen, he can select to deny all access to his account until his information is changed. This feature can be also activated outside of the platform, in case some outsider has gained control of his account and changed the password, blocking the actual user from gaining access. The user will be able to regain access and change his password from the access points as described in section 5.1.

3.2. Server Security

Open Source

Contrary to common sense, all parts of the servers hosting the system including software and hardware firmwares will have their entire source code available to the public. This will remove any doubt of vote manipulation by the group that maintains the server and the security analysts.

Security Service

Through a service, the systems and programs that run in the server will be confirmed to be the same with those available to the public and no other service or program will be able to run in the server.

Any change or access to the system by anyone for reasons of repair or upgrade will be automatically

logged and be public available in a detailed action changelog and live streaming. Maintenance will be publicly announced some days before so that the users will be able to know when to track the changes live in the server.

Hacking

Citizens, developers and hackers should be actively encouraged to hack and intrude clones of the system. State or university hosted hacking events will be organized as competitions. Anyone who can find a vulnerability or a bug in any of the system's files, server's firmwares or any component of the system will be rewarded by a state pool of funds, reserved especially for that purpose. Furthermore, if this system is used by many societies, a collective pool of funds will far outweigh any reward that a private organization could provide to an individual to hack the system for profit manipulation.

3.3. Voting Verification

Each user will have a hash key; a “voting ticket” for each voting (Figure 2). This hash key is an alphanumerical 60 digit sequence that is changed anew for each voting affecting the user. Whether the user participates or not in a voting, he is assigned a new ticket each time.

When a user votes, his ticket, along with the time that he cast the vote and his IP address are recorded in the system. Upon the ending of the voting, the sum of the users who voted and the users who did not vote, must be equal to the total number of registered tickets. A mismatch of that sum could mean illegal manipulation.

Post-Voting

Users will be surveyed after some time to confirm the information from the referendums. If they voted or not as well as the time, and location will be showed and confirmation of those data will be asked. Statistical significant deviations from previous referendum characteristics will alert the system analysts for integrity inspections.

A post voting document will be publicly accessibly that will contain all the tickets, in categories of those who voted and those who didn't. A user will be able to confirm where his ticket is, by requesting the ticket history from his account. This PDF will be printed some days after the end of the voting, so as the total number of users won't be known immediately after voting. A user will be able to erase his ticket history. Other citizens are able to know only their own ticket, as other user tickets are changing in each voting and to access information about tickets, one has to login through the platform.

Infiltration Attempts

An infiltrator trying to vote by using random tickets, will use keys that won't exist in the registered user database and therefore be easily detected. If he attempts to vote for users who did not vote, the system will register a vote when the actual user is offline, and will alert the security. Likewise if he attempts to change already registered votes, a re-check from citizens as explained below will alert a mismatch.

The number of registered users is changing daily so this makes it more difficult for hackers to forge data they don't accurately know in the time of voting.

If the hacker attempts to create new registered users instead and then use them to vote, he will also have to create random IP addressees during the voting. This will not only create great distortions of location in the following statistical analysis but it will also create conflicts with other user's addressees. Moreover a simple human-verification system before casting the vote can prevent bots from using the system.

Vote Confirmation

Users will be able to check their voting decisions in an access point, as described in section 5.1. If users are able to verify their decision at home, they may be able to sell their votes to third parties. By going to an access point and using a specially modified computer the citizen will not be able to prove to someone else his decision, only to privately view it and verify that his vote was not altered by a hacker.

4. Proposal Submission

This system is a governance tool for a direct democracy, meaning that the existence of representatives or legislation bodies will not exist, and all each aspect of governance will stem out of the citizens. Citizens will not only be able to vote on policies but to propose and amend them as well.

There could be however, many problems arising from that procedure. In a country of 1 billion, if suddenly each citizen decides to propose a policy every day (or a hundred policies every day for that matter), there would be total chaos. Therefore the need for a means of control is crucial for the correct function of the society. It is important however that the same limit will apply to all citizens in a society and not a part of the population, as having a group of people with greater political power than the rest, nullifies the notion of democracy.

4.1. Proposal Submission Details

Users wouldn’t have to go through 100 to 200 pages that is the normal length of a legislation. They will read a short synopsis that will describe the policy, and they will have the capability to read the entire legislation if they choose. Every country has a national printing house that publishes the laws voted in the parliament; this service would continue to operate for each proposal that will go through national voting, and could even make short 5 to 10 minute videos with speakers explaining briefly the proposal for the people.

Academic Contributions

Issues like state budget allocation, technical, or proposals complex in nature that make it very difficult for inexperienced citizens to design a legislation, will obtain joint stands and proposals from university boards, laboratories or research centers. Users will still have the option to create their own proposals but will also benefit from the higher-level proposals of those expert institutions.

Super-Majority

Some proposals that are considered controversial, or address a very important issue, will have the option of the “Super-majority” feature, which requires a majority larger than 50% for the proposal to be

Voting Verification

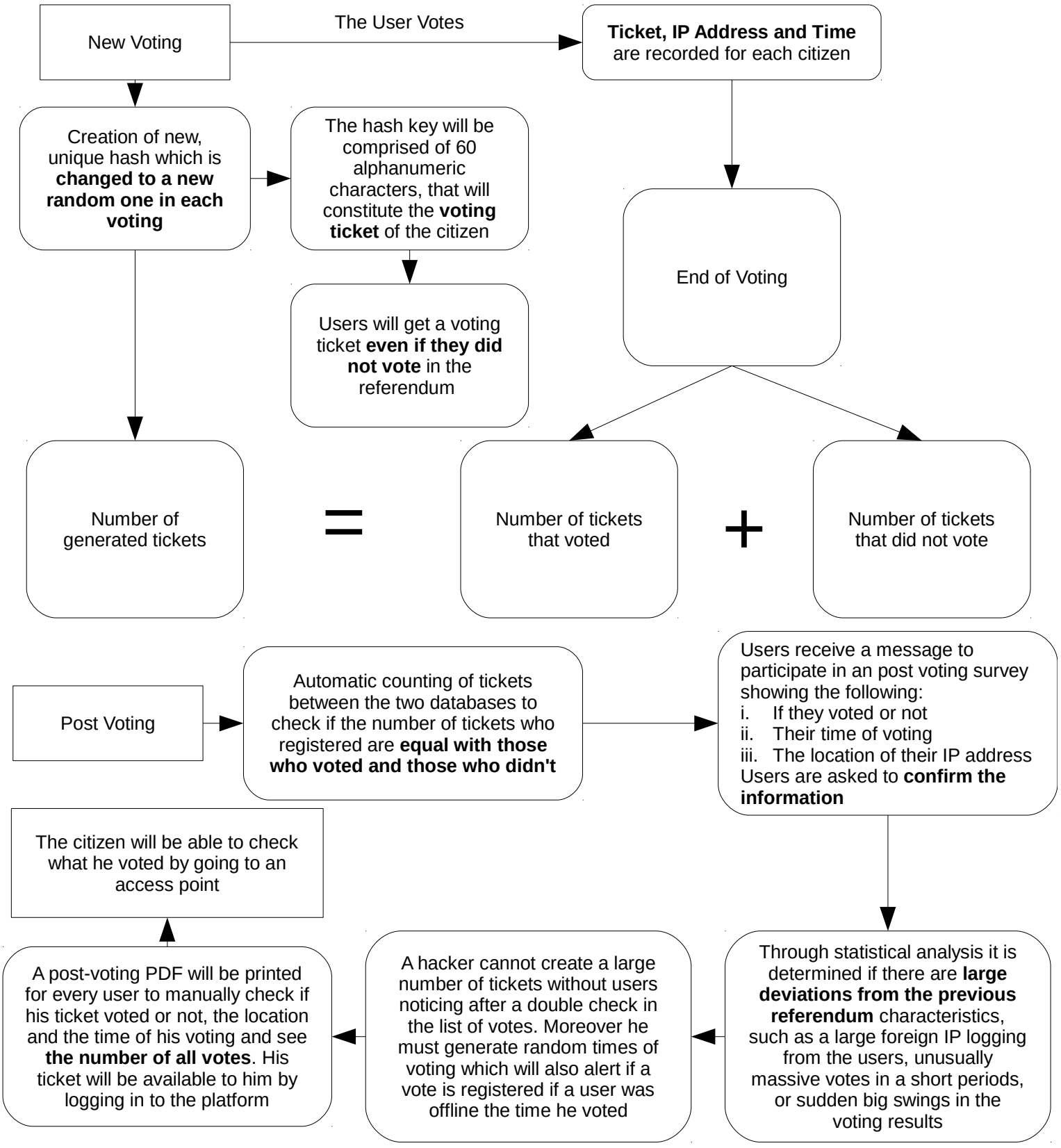

Figure 2: Voting Verification Procedure

accepted. This super-majority is usually two-thirds or three fifths, but it will be given as an option to set the required majority percentage for a proposal to be accepted.

Level of Participation

An additional option for proposals will be a minimum level of participation for acceptance. There could be a majority of over 50% in favor of a referendum but at the same time with a participation of only 5% of the population, resulting in a potentially different outcome compared to a higher participation. The citizens when building a proposal will have the option to set a minimum level of participation in order for it to get accepted.

4.2. Intra-Proposal Amendment System

As can been seen on Figure 3, the submission process of a proposal will have some additional subsystems although without being too complex.

Proposal Lock

To avoid resubmission of policies again and again by users who do not agree with a policy that has been accepted by the majority, proposals fall under subjects that are selectable through the submission process. After a policy has been accepted, a lock on the same proposal is placed, to automatically prevent the same policy to be submitted again and again. People decide on the length of the lock, and they can lift the lock in cases of emergency with enough petitions from a large part of the population. In that situation, the proposal is immediately sent to the voting phase without having to go through evaluation.

Amendments

Whenever a proposal contains numerical values, users will be able to change the values on the proposal with their own. The final values will be the statistical average of the total value submission by the population during the voting period and after a representative number of the population has submitted a value other than the proposed.

Additionally a user can choose to make a new proposal, or make amendments to existing proposals by other users; with his amendments also undergoing an evaluation by the citizens viewing the proposal. Finally, after the collaborating period has reached a deadline, users can decide whether or not the proposal is mature enough to undergo voting or the deadline needs extension. The default vote ratio for the aforementioned functions is 5:1 positives to negatives within 24 hours, for amendments to be implemented, or in general decisions within a proposal.

Proposal Submission Details

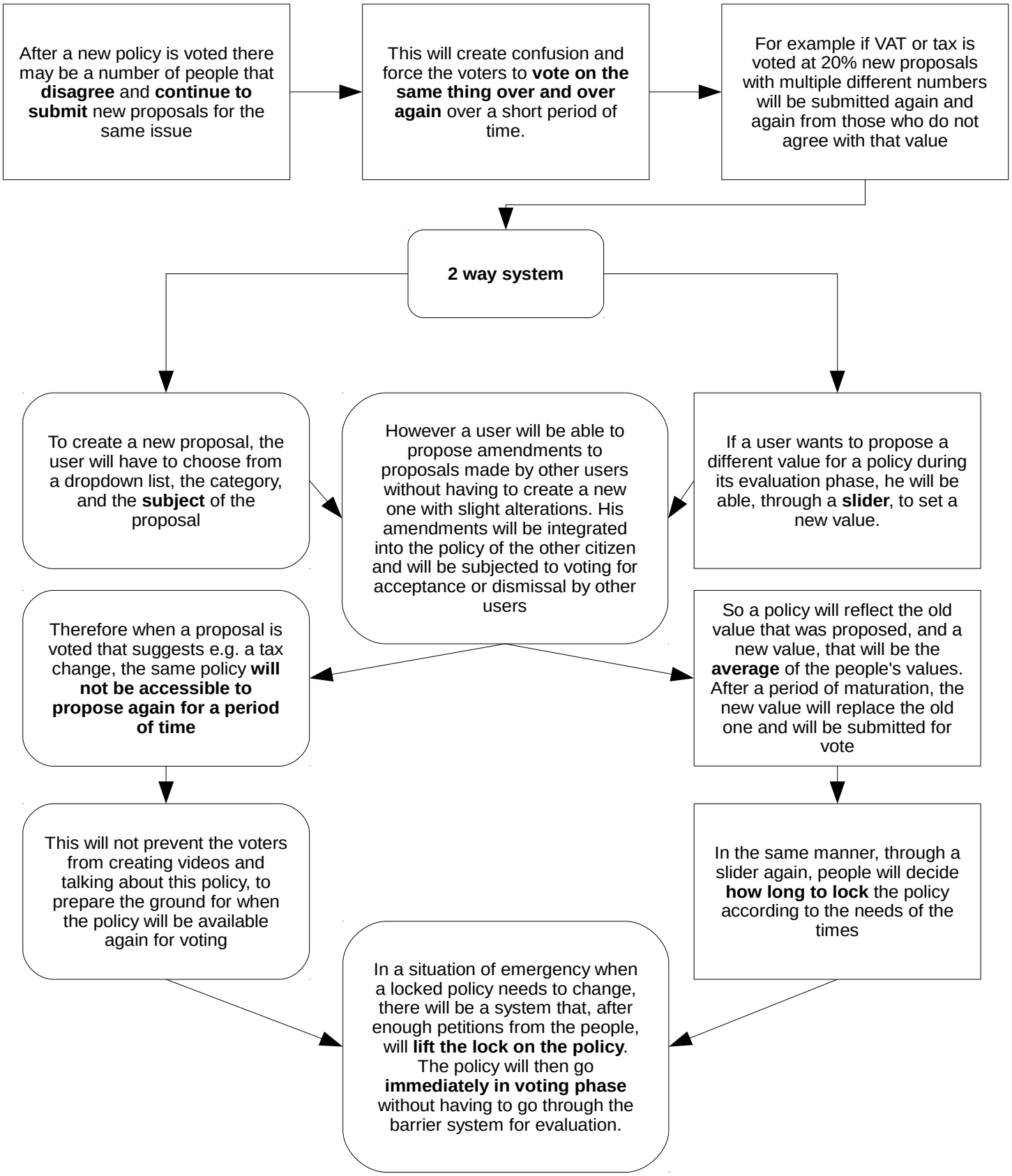

Figure 3: Proposal Submission Details

4.3. Proposal Submission Limits

To prevent the flooding of the system with petitions, especially in societies with large populations, a system that would limit the user's activity is implemented, proportionate to the size of the population (Figure 4). This is achieved by the 3 systems that are described bellow.

Cycles

Users will not be able to directly submit proposals towards the entire population; that would create a lot of chaos and spam even in medium sized societies. The system of Cycles is a process through which a proposal is submitted to a small random population sample and if it is supported by that portion, it moves to the top and is promoted to the next Cycle, with a greater portion of population. In the default model, the first Cycle than someone can submit a proposal is 0.1% of the population. A citizen is able to submit proposals only to that portion of the population. If it is supported by the people, it moves to the next Cycle, which includes 1.5% of the population. The next two Cycles are 5% and a final 15% of the population. If the proposal reaches the top of that it is submitted for voting by 100% of the population.

Favor

In the Cycle system, a submitted proposal is supported by users granting Favor. A new submission begins with an initial value of Favor, 100 in the default model, and that value disintegrates by time. The ratio of disintegration in the default model is proportionate to the size of population and it is equal to Population x 10^{-8} or the hundreds of millions of population by hour (that is in a population of 200 million, the rate would be 2 per hour). Proposals that reach 0 Favor are automatically removed, while the top favored proposals in each Cycle would advance to the next Cycle.

Political Capital

A user will have a time limit after the submission of a proposal before he can submit a new one. This is called Political Capital, and the user can have a maximum of 1 submission in all times, even if he has not submitted anything new for multiple turns. This political capital is estimated by a flat value and a value proportionate to the population size, with societies of bigger population size having increased time limits. In the default model there is a flat limit of 3 months plus the population number in milliseconds.

Comparison between China and Greece

With the aforementioned model, in China with a population of 1,355 billion, a citizen could submit a proposal once every 246 days, in a group of 1,355 million people, and his submission, if not favored by anyone would last for 7 hours, with a favor disintegration rate of 13,55 favor per hour.

In Greece, with a population of 11 million, a citizen could submit a proposal every 91 days, in a group of 11 thousand, and his submission, if not favored by anyone would last for 37 days, with a favor disintegration rate of 0,11 favor per hour.

Proposal Submission Limits

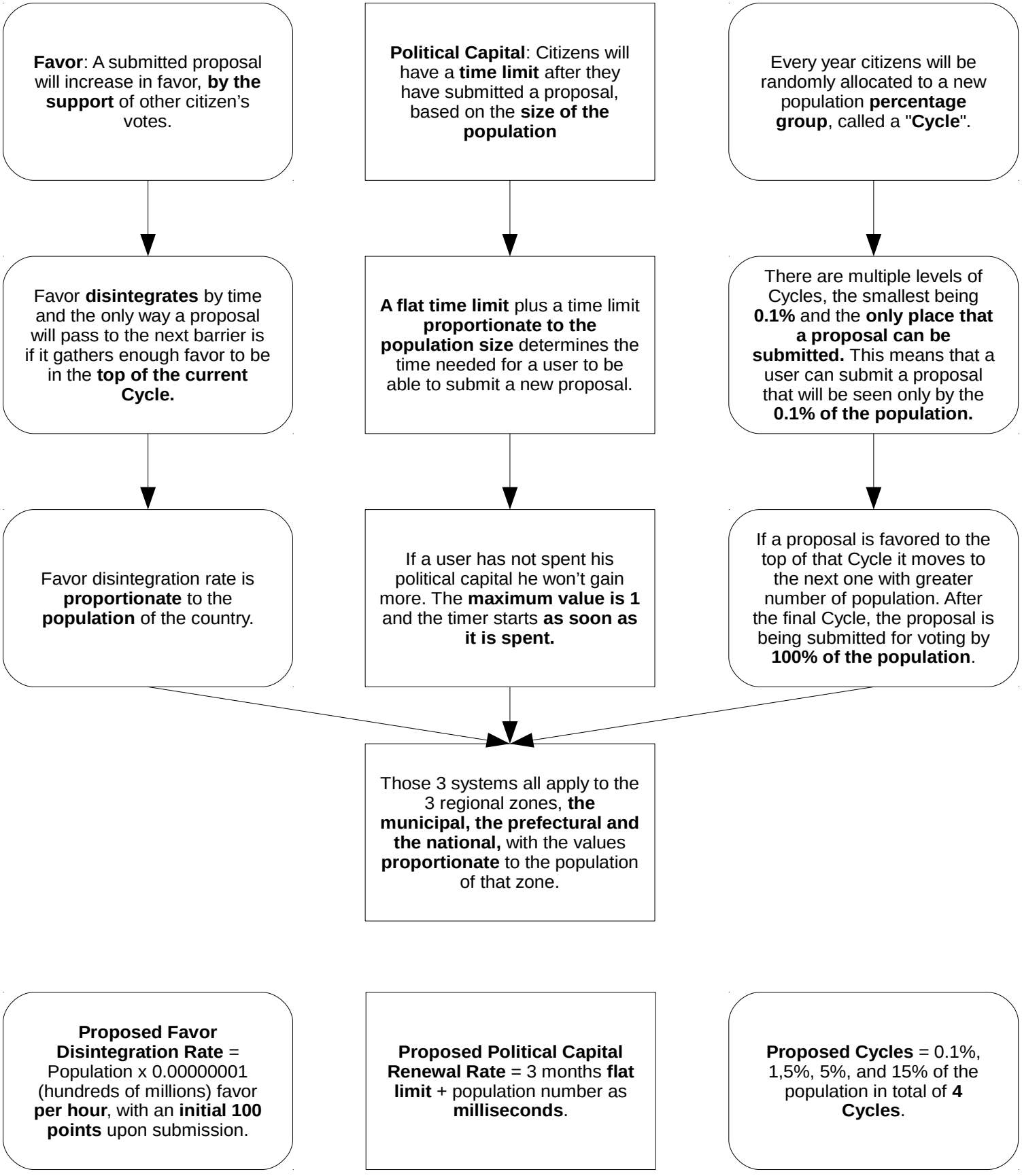

Figure 4: Citizen Limits on Proposal Submission for Abuse and Flood Avoidance

It is, however, important to mention that not every citizen is of voting age, of political interest and not all people would propose on the exact time their time limit would allow them to. However, the behavior of each population is different, and as it was previously mentioned, each society would decide on the limits and proposal details of their own system.

5. Official Systems

Along the main platform of proposing and voting on policies, multiple other systems to support the state are required. Electronic Tax Board (tax declaration), Banking, Medical Prescriptions, Health Records and many other state affairs are a reality even today with our current system and will be in the proposed system. Here we introduce some novel systems that are crucial for the function of the main platform.

5.1. State Officials

A public database with the profile of each state official such as policemen, teachers, doctors etc. will exist. A system, designed to be abuse-resistant, would act as an evaluation form that would host comments and feedback from citizens. Officials who receive constant negative feedback from diverse sources for the quality of their services would be warned and if continued, replaced.

Access Points

School and university computer rooms will provide daily public hours as an access point to the platform and the officials that supervise the room will be properly trained to assist and educate the citizens in operating the platform, as well as register new users. This will deal to an extent with the technological illiteracy and inaccessibility.

5.2. Video Collaboration Platform

A video database will exist exclusively for uploading videos with ideas and opinions on current issues. Experts on subjects could publish videos analyzing or simplifying subjects to give the unfamiliar public the proper experience before making a decision, resembling orators in antiquity.

There will be multiple filters to change the display priority in the videos list, and in technical matters, relative university boards could be invited to publish an official stand. This will be another advantage of the system, in that it will allow scientists and researchers with specialization and expertise to propose and give their position on matters, and the legislations will not be decided solely by politicians, most of whom have greatly inferior expertise than academics.

5.3. Online Course Platform

It is well established that in order for democracy to properly work, there is a need for an actively participating, mature and cultivated population.

All courses and curriculum material from all the levels of the public education will be included in an online and asynchronous platform that will allow any citizen to attend courses from any level of the

public education system including the universities.

Online courses on the function and operation of the platform will exist for any citizen who would like to be informed.

5.4. Constitution

The constitution of the society will be easily accessible online and made by the people. Due to the long term assurance and stability a constitution should provide, after a final version of the constitution is decided, it will be locked for a period of time from changes, usually for years, with the procedure described in section 4.2. However the need for some reform does emerge over time. During that period, an improved version of the constitution could be developed by the people and the replacement of the old one with the new version, will require a super-majority vote to adopt as well as a minimum participation limit as described in section 4.1. If it is not accepted by the super-majority, the older version will continue to be in effect until a change is required.

6. Conclusion

The present paper described the features and functions of an online direct democracy platform. The main focus was the collection of systems in proposal submission as this constitutes the main aspect of differentiation from previous e-governance systems designed for representative democracies. The development project of the platform does not adopt political orientations or positions; instead its main purpose is to provide a multitude of instruments and technologies that allow societies of every size or need to function as direct democracies, and aid in the implementation and adoption of the system.

The open source nature of this platform allows it to be built by everyone, for everyone; in a sense, a democracy in practice. Many services in today's societies are deeply rooted into the representative system, but with a planned and gradual transition this system could fully replace current forms of government. However it will require, both by developers and citizens, constant work, improvement and change, as all living systems do.

We hope in the social contribution of Epitome and the success in its purpose to improve the societies of the world, even if its ultimate use will be to provide ideas or even programming code to other projects that strive for the prevalence of democracy.