Pressing to stop climate change with a Civil democracy first surveys platform

Introduction and technical requirements of a Civil democracy platform to unite global civil society

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Abstract: Civil democracy is a new democracy concept in which individuals enter trust in actors that contributes to making political decisions, ultimately based on individual evaluations which can take the form of both either trust or direct participation. Starting this network begins with asking people about such trust with surveys as described in this document.

Civil democracy is a new concept of democratic decision making that starts with a democratically based civil society network linking civil society actors, so-called 'open actors' (OAs) based on democratic trust:

- Both individuals and OAs enter which (respectively other) OAs they trust.
- Based on this trust, trusted OAs contribute to making political decisions.
- All decisions are ultimately based on the evaluations of individuals, which usually are expressed in the form of trust into OAs but can (and shall) be expressed in the form of direct participation, as well.

This novel concept, and why we need it now, is described in a book upcoming in June 2022 (Scholtz 2022). Starting this network begins with asking people about their trust in civil society actors, with surveys as described in this document.

This document has two parts: It starts with user stories that shall clarify what user experience is aimed for. After a detailed table of contents, the subsequent, longer part contains material in the style of a classical technical requirements paper with describing the very concept of Civil democracy, three current implementation specificities, necessary tables, the surveys, pages for results presentation and contributions, and administrator tools. The appendix contains some example mockup screenshots, references, and two additional papers with more specific calculations.

CIVIL DEMOCRACY
SUSTAINABILITY NEEDS RESPONSIBILITY NEEDS CIVIL DEMOCRACY

1   User stories

To press for better policies, world citizens (individual voter, IVs) want to make decisions on complex matters on a global scale.

This is done using the following steps:

1.1   Entering decisions (ADM)

Administrators (ADMs) enter decisions.

1.2   Entering trust (IVs/OAs)

To ease their individual decision making, IVs mark (in a list) civil society actors, subsequently called 'open actors' (OAs), to enter their trust in them. The same is true for OAs themselves.

1.3   Differentiating trust (IVs/OAs)

To specify it, actors may differentiate their entered trust in OAs. (see 5.2.2)

1.4   Entering decision options (ADM/OAs)

ADMs and OAs enter decision options (DOs).

1.5   Entering/adapting option rankings (OAs/IVs)

OAs and IVs rank available options for decisions. In case actors have entered trust in OAs that already have entered own rankings, the sequence in which options are presented is calculated based on the trusted OAs' rankings.

1.6   Comparing options (IVs/OAs)

Actors closer inspect pairs of options. (5.5)

1.7   Entering arguments (OAs)

OAs enter arguments for ranking DOs over other DOs.

1.8   Supporting arguments (OAs/IVs)

Actors support arguments.

1.9   Retrieve current states and decisions (everyone)

Everyone sees current decision states and final decisions as calculated based on the individual rankings present at the respective or final date.

Additional to these core functionalities, the following functions are necessary:

1.10   Entering OAs (ADM/IVs/OAs)

Actors add open actors they know of and see as trustworthy, including sub-organizations of already entered OAs.

1.11   Becoming or claiming open actors (IVs)

Every IV can become an (individual) open actor. For organizational OAs, to have their entered option rankings count for the identity of their (already existing or self-created) civil society organization, individuals that want to represent an OA need to claim the respective identity and provide data that allow verification.

1.12   Confirming representation (ADM)

The administrator gets data of claimed open actors to decide over their claim, confirms rightfully claimed OA representations, and discontinues OA representation in case of evidence that an OA has been claimed irregularly.

1.13   Entering and adapting data

IVs and OAs (the latter after confirmation) enter and update/maintain their data and sign the 'responsibility manifesto'. ADMs

1.14   Inviting others (OAs/IVs)

Users get a link that would allow others to start Civil democracy with already having a specific OA supported.

1.15   Contributions and sales

Users answer a survey about their ability to contribute to Civil democracy and support it by voluntary contributions or buying books.

1.16   Help

Users get explanations to respective pages.

1.17   Blog access

Users access the existing WP blog.

Contents

2 Civil democracy

2.1 Concepts, terms, notation

The following concepts will be used in describing Civil democracy:

- **Decision** = selection of one or more options based on voter support; final result of the process ($e \in 1 \dots E$)
- **Option** (decision option, DO) = entity from a set to chose from (indexed with $k \in 1 \dots K_e$)
- **Voter** (individual voter, IV) = ordinary user entering only private trust and support ($i \in 1 \dots I$)
- **Open actor** (OA) = user that enters publicly visible actions, specifically new options and support for options ($j \in 1 \dots J$)
- **Support** (option support) = numbers relating users (both voters and open actors) and options. For each decision and each user, support either is zero in case no support expression exists, or in any other case it adds up to one (for voters $z_{ik} \in [0,1]$, for open actors $w_{jk} \in [0,1]$)
- **Trust** = like support, only with regard to open actors instead of decision options. Numbers relating users (both voters and open actors) and open actors. For each user, trust adds up to one. (Denoted as $v_{ij} \in [0,1]$ for voters and as $p_{jj'} \in [0,1]$ for open actors.)
- **Argument** = content that supports one or more decision options in comparison with one or more other options.

2.2 Core relations

2.2.1 Trust and support

Voters i support open actors j with entered trust v_{ij} that forms a matrix $V_{(I \times J)}$. For every voter who has started entering trust in Civil democracy, $\sum_j v_{ij} = 1$.

Open actors k support decision options k for decisions e with entered support $w_{e,jk}$ that forms matrices $W_{e,(J \times K)}$. Open actors, however, do not need to form an opinion with regard to every question. With regard to any question, they can choose between forming an opinion and define own $w_{e,jk}$, or remain abstentious. Hence $\forall_{j,e} \sum_{k_e} w_{jk_e} \in \{0,1\}$: If an opionion is formed, $\sum_{k_e} w_{jk_e} = 1$, otherwise it is zero.

2.2.2   OA abstention and normalization

To allow OAs to refrain from having an opinion with regards to every upcoming decision however makes it necessary to include a normalization that preserves the equality of the vote. If $\sum_{k_e} w_{jk_e} = 0$ for some j which have been chosen, we define

$$\phi_{ie} := \left(\sum_j \sum_{k_e} v_{ij} w_{jk_e} \right)^{-1}$$

a vector ϕ_e that covers all ϕ_{ie}, and the $I \times I$-matrix $\Phi_e = \phi_e I_{I \times I}$, a square matrix with the ϕ_{ie} on the main diagonal.

2.2.3   Indirect support

Every voter who has entered trust for one OA that has entered an opinion for a decision, i.e., differentiated support for one or more options available in that decision, can be represented by their indirect support

$$\tilde{z}_{ik_e} = \sum_{i \in 1 \ldots I} \sum_{j \in 1 \ldots J} v_{ij} \phi_{ie} w_{jke}$$

and all these individual values form a matrix

$$\tilde{Z}_e = V W_e$$

Indirect support for voters is used for displaying options for direct-democratic decision-making and for representing the voter in case of abstention.

It is calculated only based on the support of their directly trusted OAs, and if the voter has trusted OAs which did not form an opinion but have entered trust in OAs who did, this support of second-level trusted OAs is not used for calculating indirect support. For such users, the display sequence of options for direct-democratic decision-making follows the ranking of support in the overall population, and all options receive an initial support of K_e^{-1}.

Open actors are not represented: If they do not see a decision as part of their profile, they abstain. Their display sequence, however, is calculated based on the already entered support in their whole network of open actors and their trust relations, where all (at the moment of analysis) abstaining open actors are represented by their own trusted open actors and their display sequence, all abstaining OAs on this second level of trust are represented by their trusted

OAs on a third level of trust, and all abstaining OAs on this third level of trust are represented by their trusted OAs on a fourth level of trust. To simplify calculation for the current MVP implementation, we stop at this fourth level.

2.2.4   Decision making

Actors (both IVs and OAs) get decision options presented in a ranking based on these indirect support calculations. They primarily adapt the ranking by changing option positions through drag and drop.

New option support values $z^*(r(k))$ (here described using the notation for voters, but equivalent for open actors) are calculated under the premises that

- only one DO ranking position $r(\bar{k})$ is changed at a time, but it may be changed by $q \geq 1$ more than one position,
- all other values remain constant,
- in the case of a DO position changed by more than one position, the values of the DOs against which it is shifted remain constant in their relations
- the new value of the shifted option is placed at the mean of its two neighbors.
- If there are equally ranked (indifferent) options, and the shifted DO is placed between them, it is treated as indifferent with them, getting the same value.

These assumptions distinctly define the calculation of new values.

Defining Σ_z as the sum of the values $z(\cdot)$ of the $q + 1$ options that change positions which is the same before and after the shift, and $\theta = \frac{\Sigma_z - z(k(r(\bar{k})+q))}{z(k(r(\bar{k})+q))}$ referring to the pre-shift value of the highest adversely affected option $z\left(k(r(\bar{k}) + q)\right)$, we can derive the new value for the shifted option as

$$z^*(\bar{k}) = \frac{1}{1+\theta} \left(\Sigma_z + z(k^+) \frac{\theta}{2} \right)$$

Appendix 1 'Calculating support after re-ranking within Civil democracy' contains the derivation.

Lowest-ranked options may have got zero support. In case a zero-support option gets shifted upwards, its support value is calculated using a

fixed factor of 2 for the relations above and below, all other support is adapted in relation.

2.3   Calculating decision results

2.3.1   Decision types

The way of calculating decision results depends on the type of the decision.

(1)   Normal: For one or more winning option(s). In this case, support sums up to one, just ordinarily used, Condorcet winner detection or backward elimination used;

(2)   Dimensional: For exactly one option that is an optimum value on a continuous dimension, all others ranked according to their distance, involves restrictions in the entering of rankings. In this case, one optimum value on a continuous dimension, all others ranked according to their distance

(3)   Flexible budgeting: For a number of options that is determined not absolutely but by exceeding a support threshold, includes using support measures to allocate resources. In this case, support sums up to one, chosen is a flexible number of options above a threshold considered with budget shares according to their support

[Note that there is a type (4) Fixed budgeting: Support sums up to one, options used in sequence from above as far as they fit into the budget. This type will bring traditional participatory budgeting into Civil democracy, but will not yet be implemented in this version.]

Decision results are calculated using two different methods. In any case, backward elimination is used. For decisions with only one winning option, first a Condorcet winner is searched. Only in cases with no Condorcet winner, backward elimination is conducted. In any case, this is done based on the individual support voters give to options, based on either their entered

2.3.2   Calculate indirect support

For all voters who have participated in a decision prior to its end date (d6, see below), direct support values exist. For all voters who have not but support one or more open actors that participated in the decision, indirect support is calculated as described above.

2.3.3   Simple solution

For dimensional decisions and flexible budgeting decisions, the option(s) with the highest support is (are) chosen.

For flexible budgeting, all options with support above the predefined threshold are chosen, and support normalized over these chosen decisions is calculated and presented.

2.3.4   Searching for a Condorcet winner

For decisions with only one winning option, a Condorcet winner is searched for. This is done in the following sequence:

- Compare the first two options.
- To compare two options, for each voter normalize the support for the two options. I.e., divide by their sum. (Example: If two options are supported with 25% and 5%, the normalized support is 25%/30%=75% and 5%/30%=25%. Add up normalized support over all voters. The option with the higher sum wins. (In all comparisons, exact ties are broken by option entering date, with options entered first winning.)
- Compare the winning option with the next one. Continue each time comparing the winning option of each comparison with the next one up to the last option.
- Compare the last winning option with all options it has not previously been compared with. If it wins against all, it is the Condorcet winner. If it loses against one other option, there is no Condorcet winner.

If there is a Condorcet winner, this is the winning option. If there is no Condorcet winner, or in any case with more than one option to be drawn, proceed with backward elimination.

2.3.5   Backward elimination

Backward elimination is calculated as follows:

- (In case the number of winning options is greater than or equalling that of available options, no further counting is needed.)
- Add up all support over all voters for all options.
- Delete the least supported option.
- In case the number of winning options equals that of available options, counting is completed.
- In case there are still more options available than can be chosen, normalize all support

after deletion of the deleted option's support so that its sum is one again. (E.g., if support to five options was 40%, 30%, 20%, 10%, 0% and the third option was deleted, normalized support values are 50%, 37.5%, [deleted], 12.5%, 0%.)

- Continue from step 2 until counting is completed.

2.3.6 Participation premium
Voters who have checked their indirect rankings and approved their decision (whether with applying changes or without) are counted higher than those who stay passively represented. The difference is specific to the decision. The default value is 1, i.e., voters actually participating in the decision are counted double in comparison to those who do not.

2.3.7 Presentation of results
The presentation of results is described below.

3 Implementation specificities

3.1 Linked counting
Linked counting is one of several add-ons to Civil democracy that are not integral part of its core program. It has however been included in the current implementation for the strategic necessities described above.

Linked counting arises in two situations. On one hand, it arises out of splittable decisions, on the other, due to the necessity to deviate from voting equality.

3.1.1 Splittable decisions
Splittable decisions are decisions for which the two options exist of either to split them into subdecisions or, ignoring this possible subdifferentiation, to treat them as one. In selecting policy options or candidates, it is often useful to think first about desirable qualities that may form criteria and rank decision options according to these criteria separately, while some actors, largely voters but possibly even open actors, may wish to avoid to dive into these details.

To allow for splittable decisions is useful both from a normative and a pragmatic perspective: In alignment with Civil democracy's normative goal of inciting responsible, well-informed decisions, it is useful to have such an opportunity. At the same, it pragmatically constitutes a proposition unique to Civil democracy that underlines its qualities in comparison to existing systems of decision-making.

3.1.2 Deliberate disproportionality
The idea behind deliberative disproportionality in a global Civil democracy implementation is to mediate between large and small nations, and during the growth of Civil democracy between societies where its spread is already well-advanced, and such where it is only starting. Symbolically (and for easier calculation) we describe this as between societies one billion and societies one million in size. In proportional counting, the relation between a pair of such two nations would be 1:1000, an extreme malapportionment as in the UN General Assembly gives them a relation of 1:1. A mediating position between these two extremes would be to have the geometrical mean between them, i.e., a relation of about 1:31.6 ($1:\sqrt{1000}$).

This is implemented by assigning every voter a raw vote weight equalling the square root of the size of their national electorate within Civil democracy (plus 100 to avoid overly large effects at the early start of the implementation) and to multiply afterwards these weights with the inverse relation of weighted and unweighted sums in order to have in both counting processes an equal number of voters.

(Note: Voters who have entered more than one nationality are counted with the inverse of their number of nationalities for each of them.)

3.1.3 Doing linked counting
Under linked counting, it is both necessary to arrive at one final result and to know the results of the subdecisions.

For splittable decisions, that implies communicating subresults for every decision split, in the current example the delegation roles. The bindingly decisive end result is however calculated using the sum of the different role considerations, weighted with the weights derived from the flexible budgeting decision on roles.

For deliberate malapportionment, 3 + N results are interesting for communication, N in this case being the number of national societies from which the electorate is drawn:

- One result calculation under strictly proportional counting,
- one result calculation under deliberate mal-apportionment using the square rule described above,
- one result under strictly proportional counting within each national sub-sample,
- and one result calculation that adds the numbers of strictly proportional and deliberately disproportional counting (weighted so that they have the same amount of influence on the result).

The latter is the bindingly decisive end result.

3.2 OA suborganization representation

3.2.1 Principle

As long as OAs have not yet been centrally claimed, they are represented through successfully claimed and active suborganizations. Their initial trust portfolio does hence consist of these OA suborganizations, weighed with the support these OA subs receive.

3.2.2 Calculation

To decrease computation load, support received is calculated based on the number of voters trusting the OA suborganizations, not on their trust shares.

It is recalculated each time a new voter includes an OA suborganization into their trust portfolio, if the last recalculation is longer ago than a fixed time span (set in the default values table, initially to one hour).

3.3 Multi-language support

The site starts in English and German, other left-to-right languages will be added soon. Non-Latin and right-to-left leaning languages are not included in the current version.

(Note: The currently existing site civil-democracy.org is hosted using WPML for multi-language support, currently for English, German, French, Italian, and Hebrew. Spanish, Portuguese, Russian, and Arabic are expected to be added soon.)

For any entry of a decision option a OA does, for DO short name and description the option to enter user-based translations has to be given.

4 Notes to tables

4.1 Default values

The following general values:

- relation number for OA trust, indicating the relation between trust on different levels (m in 5.2.2)
- relation number for option support, indicating the relation between support on different levels (r_2 in 5.4.3)
- time span for which a recent results page is displayed as initial page (see
- time span between voters' indirect rankings recalculations (4.10; initially set to one hour)
- time span between recalculations of unclaimed suborg-based OA positions (see 3.2.2)

4.2 Decisions

Decisions are entered by the administrator. They are defined through the following (all entries that are not explicitly described as 'optional' are required):

- decision short name (40 chars)
- decision logo (png or jpg, 400x400px)
- decision question
- decision description
- decision (result calculation) type
- upper bound (dimensional decisions only)
- lower bound (dimensional decisions only)
- threshold value (flexible budgeting decions only)
- optional added documents
- number of options to be finally selected
- participation premium

For each decision, in a schedule table defined below are six fixed dates and an infinite number of flexible intermediate results dates entered for each decision.

4.3 Decision schedule

For each decision, six fixed dates are required. Additionally, intermediate results dates can be entered.

- start date d1 for entering options (for all dates see below)
- start date d2 for entering OA rankings
- start date d3 for adapting individual rankings

- end date d4 for entering options
- end date d5 for entering OA rankings
- end date d6 for adapting individual rankings.
- dates for giving intermediate results prior to the final counting

Every fixed date category (options, OA rankings, adapting individual rankings) needs to be given a positive time span (d1<d4, d2<d5, d3<d6), and both start and end dates need to be sequential (d1<d2<d3; d4<d5<d6). Each inequality implies a difference of at least 6 hours.

4.4   Decision options (DOs)

Decision options are entered by the administrator or by open actors. They are defined through:

- option short name
- option value (for dimensional or flexible budgeting decisions)
- option logo
- option description
- optional added documents
- date of entry

4.5   Arguments for options over others

Arguments are entered by open actors. They are defined through:

- argument short name
- argument description
- optional uploaded documents
- which option(s) the argument supports
- which other option(s) the argument rejects
- entering OA
- date of entry

4.6   Individual voters (IVs)

Individual voters enter themselves. They are defined through:

- surname
- first name
- email address (to be verified)
- birth date
- nationality
- postal address (address line 1, address line 2, area code, city, state, country)
- phone number (optional, but required in case an existing open actor shall be claimed)

- date of entry (responsibility manifesto signed)
- optional uploaded identity documents
- trust degree (1 to 4, 1 'very low', 2 'somewhat', 3 'rather high', 4 'high')

Trust degrees are explained as follows: 'How much do you trust your open actors judgement? Do you trust only their direct evaluation ('very low'), do you trust those other OAs your trusted OAs trust ('somewhat'), or, since you know all decisions are ultimately yours, do you want to extend your indirect trust network farther ('rather high'), even indefinitely ('high')?' (see 4.10 below)

4.7   Open actors (OAs)

Open actors are entered by the administrator, by IVs, or by themselves. They are defined through:

- individual or organization OA? (dichotomous)
- image: OA logo for organizations, portrait image for individual OAs
- official email address
- website (optional)
- for organization OAs: geographical scope (local, national, international)
- location (city, country)
- for organization OAs: does the OA have suborganizations?
- for organization OAs: is the OA a suborganization of another OA?
- if so, of which OA?
- date of entry
- date of last calculation in the case of OAs represented by suborganizations
- individual voter who entered the OA data
- is the OA actively managed, i.e., has it been claimed by one IV and this claim been approved by the administrator?
- date of approval
- IV who currently manages the OA positions
- list of IVs who previously managed the OA positions, with dates of beginning and end

In presenting OA logos, there are three different stages that have to be distinguished:

- OAs that are already actively managed within Civil democracy (i.e., have been successfully claimed by an IV) are presented differently
- compared to those for which this has not yet been the case.

- A third, intermediate state applies to OAs with suborganizations where the central organization has not yet been claimed but at least one local suborganization has.

The actively managed case is the normal; its lack is indicated by some kind of othering: A frame, an asterisk, presented smaller, presented under a transparent layer – there are many options to do so and the choice is left to the developers' expertise in UX and coding ease, but needs client approval.

4.8 Open actor representation claim

Individuals claiming the representation of OAs open entries with

- OA id
- IV id
- information about upper organizational or institutional level to confirm their role (text field with up to 1000 characters, required)
- scan or photograph of a document conforming that role (optional)
- state of administrator decision (open, accepted, negative)
- date of entry
- date of decision

4.9 State of voting or direct support

The state of support or voting is changed by the actors (IV or OA). Each state consists of a set of entries with

- supporting/voting actor id
- decision id, or a specified id for trust if it regards a trust change
- supported/voted OA or DO
- value
- change date and time

Values add up to one over each set.

4.10 State of indirect support

The state of indirect option support is calculated when a user studies a decision, and the last calculation is not longer ago than the 'time span between recalculations' set in the default settings.

Indirect option support is calculated as described above (see 2.2.3). If there is no indirect support available (or if it has been restricted by a low trust degree), options are presented in a default order resulting from the direct, or indirect to the second degree, support of all IVs.

The data base entries are

- supporting/voting actor id
- decision id
- supported/voted DO
- value
- change date and time

Values add up to one over each set.

4.11 Support for arguments

Arguments can be supported by both OAs and IVs, and the sequence of their appearance is based on this support.

- Supporting actor id
- Support weight

Support weight is one for IVs and the summed support to the second grade for OAs at the time of entering support for the argument.

4.12 Changing acts

Each change in all of the tables mentioned above is documented through

- The state before the change
- the state after the change
- change date

See   for general format considerations for all tables.

5   The surveys

5.1   Overview and sequence

The user goes through the pages in the following sequence:

(1)   In case of a recently concluded decision, its results page (1.9/6.2) is presented first
(2)   Trust survey (1.2/1.3/5.2)
(3)   Adding open actors (1.10/5.3, optional)
(4)   Participation survey (1.5/5.4, including the link to option comparison sheets, 1.6/5.5, and adding arguments, 1.7/1.8/5.6)
(5)   Having votes counted (IV registration) (1.13/5.7)
(6)   Becoming an open actor (OA registration) (5.81.11/5.8, optional)
(7)   In case of becoming an OA, entering the participation survey again (1.5/5.4, including linked comparison sheets, now with the option to add arguments, 1.7)
(8)   Results pages (1.9/6.2)

From Trust, Participation, Option comparison, and Results, explanations to the surveys (1.16/5.9) are assessed.

5.2   Trust survey

5.2.1   Presenting OAs

The trust survey presents, in a condensed way, existing open actors, regardless of whether they are already participating in Civil democracy or not.

The survey presents these open actors with a picture (organization logo or individual portrait) and name. It allows to access a description and gives the option to assess trust on a scale.

The open actors are presented in a grid depending on access mode, with probably four OAs in a row on mobile and seven on the Web. (See mockup screen #1.)

One grid element contains

- the OA logo
- OA short name
- OA short description

Clicking or tapping on the OA element shall have the following functions:

- Grade 0: Pop-up with OA logo, long name and the first 50 words of the long description, and link to a document with the complete long description and additional information.
- Grade 1: Assigning trust on level 3, in case the OA was not trusted before. In case the OA was trusted before, clicking/tapping it is interpreted as Untrusting, i.e. resetting trust to level 0.
- Grade 2: Pop-up with trust levels from 0 to 5, with the level as set in grade 1 as selected (3 or 0) and option to change to higher or lower levels.

Grades shall be easily distinguished; how this is done, is left to the programmer's discretion.

OAs are presented in tables of one screen length, with the options to show more or to continue to the next steps of either entering more open actors or to participating in decisions.

OAs are presented in the following sequence:

- sorted first by support (decreasing starting with the highest support),
- afterwards by a sum of $s_i + 2000/(p_i+19)$, with s_i being the sum of voters currently supporting the OA (not weighted by the support measure, just counting every supporting voter as one) and p_i being the position at which it has been added to the database, again decreasing starting with the highest sum.

Other sequences are left to subsequent renewals.

5.2.2   Quantifying trust

Upon completing the reordering and hence the vote, the sequence is turned into support by first calculating raw votes from the sequence, in which the OAs on trust level 5 are the value 1, those on level 4 value $1/m$, those on level 3 the value $1/m^2$ and generally those on level $i>0$ the value $1/m^{5-i}$. OAs with trust level 0 receive zero raw support. The value of m is initially set to 2 but shall be editable in the backend tables. (4.1)

Based on this raw support, a support vector is calculated through normalization, i.e., dividing all values by their sum, so that the sum of final support is one for every voting actor.

5.2.3   Entering trust via address link

If the website is addressed through an open actor address link (see section 5.8.4), it starts with the trust survey with setting trust for the respective open actor to level 4.

5.3   Entering open actors

A number of OAs are entered by the administrator.

In case survey participants know civil society actors who have not been previously covered, they are asked to add them to the database.

5.4   Participation survey

5.4.1   General principles of Civil democratic participation

User are asked to participate in decisions by ranking options.

Decision options (DOs) are presented in a list with DO logo, short name and short description. (Although short names and short descriptions are longer here than in the case of OAs; see mockup screen #2.) Again, a grade 0 interaction shows a pop-up with DO picture, long name and the first 50 words of the long description, plus link to a document with the complete long description and additional information.

The sequence in this list represents the sequence of support that a voters or their trusted open actors give to a decision option. The sequence is changed by drag and drop. An option can be moved

- on top of the list to indicate the highest possible support
- to the bottom of the list to indicate zero support
- on another option to indicate equal support as for this other option
- or between two other options to place it in the support measure between the two.

5.4.2   Option sequence in participation

The sequence of this list is arguably the most important aspect of Civil democracy, because it allows for eased and informed direct-democratic participation.

In options are presented to the user in the indirect ranking resulting from their open actor rankings weighted by the relative trust placed in them as described in 4.10 above.

5.4.3   Voting and reordering

In normal and flexible budgeting decisions, voting is done by either

- doing nothing while having entered trusted OAs, i.e., being representedby them
- confirming the ranking that has been calculated based on the trusted OA rankings
- confirming an own ranking that has been created by reordering the indirect ranking from the trusted OAs.

Reordering is done preferably by drag and drop of options within the existing ranking, which hence always serves as a default. (Other solutions are however possible but need to be discussed in advance.)

5.4.4   Between the lines

Between every pair of two neghboring options, a interoption line is displayed with supporters and arguments for both possible rankings:

- The three main OAs supporting the ranking of the preferred over the rejected option, and the three main OAs supporting the opposite ranking are presented with their logos
- The main argument supporting the ranking of the preferred over the rejected option, and the main argument supporting the opposite ranking are presented, plus in each case the number of additional existing arguments.

Clicking or tapping on the interoption line opens the option comparison sheet described below.

5.4.5   Dimensional decisions

For dimensional decisions, options are presented on a vertical line representing the dimension, from the highest values entered above to the lowest values entered below.

Users choose only an optimal point.

Raw support for an option with value x is calculated as $0.75*d(x) + 0.25*(d(x))^2$, based on a distance measure $d(x)$ calculated as $d(x) = | z(x^*) - z(x) |$ based on logit values $z(x)$ calculated as $z(x) = 1 / (1+\exp(x*6/r^+))$, where r^+ is the range boundary (upper or lower) with the higher absolute value. Appendix 2 'Calculating support in dimensional decisions within Civil democracy' contains more information.

Final support is, as always, calculated through normalization, i.e., dividing raw support by the sum of raw support over all options.

5.4.6   Turning sequence into vote

Upon completing the reordering and hence the vote, the sequence is turned into a vote.

5.4.7   Radicalization

The actor has the option to radicalize it. This is done by first calculating raw votes from the sequence, in which the best option is given the value 1, the second best the value $1/r_2$, the third best the value $1/r_2^2$ and generally the i-th option the value $1/r_2^{(i-1)}$. The value of r_2 is initially set to 4 but will be editable in the backend tables.

Based on this raw vote, a vote vector is calculated through normalization, i.e., diving all values by their sum, so that the sum of final votes is one for every voter.

5.5   Option comparison sheet

Clicking or tapping on the interoption line described above opens an option comparison sheet. It presents the two neighboring options in two columns with, in each case

- option logo
- option short name
- option description (first lines)
- current position in the IV's ranking
- the IV's trusted actors preferring this option over the compared option
- other OAs preferring this option over the compared option
- arguments for this option over the compared option, each with

  - argument short name
  - argument description (first lines)
  - document symbol in case of uploaded documents

- in case the user is logged in as OA, below the last argument a link to adding another argument

Clicking/tapping on the description opens an explanatory popup that contains the full option description and a link (resp. links) to the uploaded document(s).

Clicking/tapping on an argument opens an explanatory popup that contains the full argument description and a link (resp. links) to the uploaded document(s).

5.6   Adding arguments

Clicking or tapping on 'Add own argument' opens an argument addition screen that allows to enter for a new argument

- argument short name
- argument description
- optional uploaded documents
- which option(s) over which other option(s) the argument supports

With regard to the latter, the two options taken from the last visited option comparison sheet are entered and cannot be altered. Every other existing option can be added either on the supported or on the rejected side (not on both, of course).

5.7   Having votes counted (IV registration)

To have their votes counted, users need to register. To do so, they enter

- surname
- first name
- email address (to be verified)
- birth date
- nationality
- postal address (street, area code, city, state, country)
- optional uploaded identity documents

They check two terms and conditions pages:

- One (longer) general terms and conditions page and
- one (shorter) 'Responsibility manifesto'.

Presenting the two documents needs to communicate a difference: The general terms and conditions are about the same that are checked for using any other web-based services and require no special attention; as a result, they are presented in a smaller font site.

The 'Responsibility manifesto', to the contrary, is a manifesto to use the power that comes with Civil democracy in a responsible way and mindset. It consists of only a few short paragraphs and shall be presented in a form that encourages diligent reading.

The date of entry is stored when the responsibility manifesto is signed.

5.8 Becoming an open actor (OA registration)

Any user is asked to become an OA to be able to enter options or canvass trust from other users, either for themselves inividually or for a group or organization. (Later in a next step, both will be possible beneith each other, but to avoid the need to manage different OA accounts, the initial version starts only with one OA account per user.)

Establishing onself as an individual is always possible.

An organizational OA needs to be claimed.

5.8.1 Basic process

The basic process involves only a statement of willingness to serve as open actor plus the choice of type: Users can become open actors either as individuals or as representatives of existing civil society organizations.

5.8.2 Claiming existing open actors

In case users represent open actors that have already been entered on the platform, they have to choose the open actor they represent, or go to the process of entering it in the case it had not yet been entered before and they did not already do it previously. In that case they are asked to name the upper organizational level that can confirm their role (using a text field with up to 1000 characters) and upload a scan or photograph of a document conforming that role. (The latter is not required, the former is.)

5.8.3 Adapting and profiling trust assignments and option rankings

For any user, being individual voter, individual open actor, and representative of an existing open actor are different roles with presumably overlapping, but nevertheless nonidentical trust assignments and option rankings.

Users establishing themselves as individual open actors get the option to import the trust assignments and option rankings of their IV account.

Users representing existing open actors have to enter option assignments and option rankings anew.

5.8.4 OA address links

At the end of their registration process, open actors get a link to copy and paste in their own eletronic communications that allows to enter trust in them with one click. (1.14/5.2.3)

5.9 Explanations to the surveys

In both trust and participation survey, the complete descriptions of the respective options, plus optional documents, can be found under a explanatory page.

6 Results presentation

(Note: See above for the calculation of results.)

6.1 Result presentation dates

Results are calculated and presented at the end of the indiviual ranking adaptation period (d6 above) and at each (optional) additionally defined intermediate results date.

6.2 Results pages

A results page presents all decision-related data plus data for the chosen option(s) plus the list of non-chosen options with a success measure.

- decision short name
- decision logo
- decision question
- decision description
- optional added documents
- number of options to be finally selected, only if greater than one
- time span for entering options (d1 to d4)
- time span for entering OA rankings (d2 to d5)
- time span for adapting individual rankings (d3 to d6)
- chosen option(s) short name
- chosen option(s) logo
- chosen option(s) description
- chosen option(s) added documents
- non-chosen option(s) short name
- non-chosen option(s) logo
- success measures in case of determining the winning option as Condorcet winner: Percentage of support in the direct comparison with the winning option
- success measure in case of backward elimination: Number of elimination: the last eliminated option gets #1, the option eliminated before that gets #2, and so on to the option that got eliminated first, with the highest number.

The results page of the last closed decision within 24 hours after closing (d6) is presented first in the sequence, unless an OA link is used. (The 24 hours are stored in the General values table to allow change if necessary.)

7 Contributions

7.1 Contributions survey

The final page asks for active contributions: The ability to to present Civil democracy to OAs, different communicative skills, the ability to support expansion to specific societies (especially with regards to language skills and OA network connections)

The page furthermore needs to link to

- supporting the project with recurring (or one-time) donations
- selling the books in the shop
- inviting others by spreading a link that, in case of open actors, directly leads to supporting them. (see 5.2.3/5.8.2 above)

7.2 Incurring donations and sales

For supporting the project with recurring (or one-time) donations, Woocommerce (including its subscription tool) is available within the existing Wordpress page.

Currently, the number of products for sale adds (including different language versions and physical and ebooks) up to fifteen, and more are expected to follow.

8 Administrators

8.1 Roles

The following administrator roles need to be distinguished:

- OA entry: Entry and bulk upload of OA data. (4.7, 9.2.5)
- OA admin: Decides on claimed OA registration (1.12, 4.8)
- Decision admin: Enters decisions and decision options (1.1, 4.2, 4.3)
- Tech admin: Technical monitoring (9.4.1) plus role assignments

- Superadmin: All roles above plus all administrator roles not specifically discussed here.

8.2 Tools

The administrator needs to

- enter all tables
- be able to extract all entries from all tables at any time
- and test the system prior to usage

9 Technical side conditions

9.1 Preconditions

9.1.1 Existing website

The site https://civil-democracy.org currently contains a Wordpress blog that shall continue to be accessible from the new application (see 1.17) and can be used for implementing contributions and sales. (1.15)

9.1.2 Existing environment

The current installation provides Wordpress (6.0), PHP (8.1.7 / 8.0.20 / 7.4.30 / 7.3.33), MySQL (10.3-MariaDB), and Perl (5.32.1). Within Wordpress, WPML and Woocommerce are already installed.

It would be possible to change to a more performant 'Flexserver' environment with Bash, Image Magick, GraphicsMagick, gzip/zip/tar, MySQL, Perl, PHP (CLI/Composer), Python, Ruby, Sendmail, Wordpress, and XPDF. (For more information see https://support.hostpoint.ch /en/products/webhosting/first-steps/paths-directories-system.)

Please indicate under which environment you would work, and in case, how you would use the performance advantages of the more expensive Flexserver environment.

9.1.3 Environmental responsibility

Hosting and domains are provided by the client.

9.2 Architecture

9.2.1 General requirements

The implementation must meet the following specifications.

- Support for computers, tablets and smartphones.

- Support of popular browsers (Chrome, Firefox, Safari, Opera, Samsung) in most recent versions
- Responsive web design to support different screen sizes including presentation screens
- No use of Adobe Flash and Silverlight
- No installation of an app or other special software on the end devices
- The implementation needs to work from using a screen size of 360x640 upwards.

9.2.2   Formats

Short names of decisions, options, and arguments are restricted to 40 characters. Descriptions are restricted to 5000 characters. For all other fields, custom field lengths are used.

For documenting concepts beyond text, PNG, JPG, unencrypted PDFs and embedded videos on outside servers (as Youtube or Vimeo) are supported. For logo images, Twitter uses a standard logo format of 400x400 px, and I think we should join that standard, but I am open to suggestions.

For own graphics, vector graphics are preferred over images.

All dates include time and are entered and presented in user time zone but stored in UTC.

9.2.3   IT Security

The implementation is protected by an SSL certificate and operates in https mode and protected in the best possible way against unauthorized access and manipulation, the usual security precautions for a website are taken.

9.2.4   Quantity structure

The implementation needs to work for 50'000 IVs, 500 OAs, 100 decisions with for each decision 30 options and 200 arguments comparing options, and to be scalable without major architectural changes for 1 million IVs and 5'000 OAs.

9.2.5   Upload interface

The OA entry administrator needs the option to upload the data for larger numbers of OAs from text in a way that does not significantly restrict what can be written in the text, especially allowing for umlauts and other special characters in non-English texts.

A solution to allow for linking to the bulk upload of OA images is needed.

9.3   Branding

We have a designer who has already built screen #1 below and a whole first mobile mockup (under https://bit.ly/3y6EDDb) and will continue for the website in cooperation with the development partner.

Nevertheless, some hints about the intended design here:

There has no yet a consistent brand design been defined, but the Civil democracy logo and the trust screen mockup below give indications.

- We use white, blue (Pantone process blue C, #0085CA), black, and grey shades as starting colors.
- All OA and IV images are processed without color adaptation, so the implementation needs to be adapted to working with these very different colors and styles.
- Modern, friendly appearance with good usability is needed, well suited for responsive design.
- The design of Twitter is a good example for the intended appearance.

9.4   Processes

9.4.1   Logging and monitoring

Logging takes place on two levels:

- All saved entries and changes are logged to restore decisions in the case of intrusions.
- More generally, all user interaction is logged for assessing and improving UX.

Please indicate how much waiving of this specifications would ease effort and cost.

System status should be monitored automatically and periodically. In the event of malfunctions, automatic notification is to be sent by e-mail to recipients to be defined. Parameters to be monitored:

- Accessibility via HTTP/HTTPS and validity of SSL certificates, errors during automatic renewal of SSL certificates
- Errors during automatic backup
- Accessibility via HTTPS
- Response time > 200ms

The current values of these parameters should be visible as "system status" for the

administrator via the frontend for the person responsible for technology.

9.4.2   Performance and caching
Use caching values that do not often change to allow for good performance.

9.4.3   Testing and troubleshooting
After going live, an equivalent test environment is provided in addition to the productive implementation.

The test environment is used for testing software updates and implementing extensions.

Automated unit tests should exist for the central functionalities, which ensure processes to be correctly implemented and to function as expected.

During and after development, a separate test environment shall be available which can be used for manual testing of new versions/functions. The environment of the test environment shall be as identical as possible to the productive environment but marked visually in its front end in a way so that the test environment is clearly recognizable as such.

During a testing phase of 120 days, the development partner fixes upcoming problems related to the implementation of the original mandate.

9.5   Transactional issues

9.5.1   Development rights and documentation
The client receives all data created in the course of the project and full rights thereto.

This data includes in particular

- Source code incl. complete version history
- System documentation
- Issue tracking
- Graphics in original format

These named data are handed to the client upon completion as documentation.

9.5.2   Third-party vendors
When using third-party services (e.g. additional Wordpress packages), the corresponding contracts are in the name of the current client as customer and must be concluded by the latter.

During development and up to the end of the 120-days testing phase, the development

partner will be deposited as technical contact if required. A list of positions where this has been done will be provided towards the end of the testing phase.

10 Framework conditions

10.1   Processing
The development partner defines internal responsibilities and communicates them.

10.2   Scheduling
The schedule is proposed by the development partner in the quote and decided in cooperation. The launch is expected to be in August, 2022.

The main completion of the project is defined two weeks after the successful launch.

Eight percent of the agreed sum are paid after a successful end of the 120 days testing period.

10.3   Quotes
We need a binding quote including a schedule.

Please indicate if certain aspects of the project as described in here would lead to a disproportionate increase in effort and cost needed.

Appendix

References

Scholtz, Hanno. 2022. *Reclaim Responsibility with Civil Democracy: How to Empower Ourselves to Save the Climate, Foster Democracy, and End Violence*. Civil Democracy Press.

Mockup screenshots

From previous UI studies, we have the following mockup screenshots. They give an idea how the surveys have been intended to look like in the long term. The closer the implemented is to them the better, but in this initial version

remaining differences are okay. In case of differences to the descriptions above, always the decisions above take precedence!

Trust screen

Partipation screen (initially)
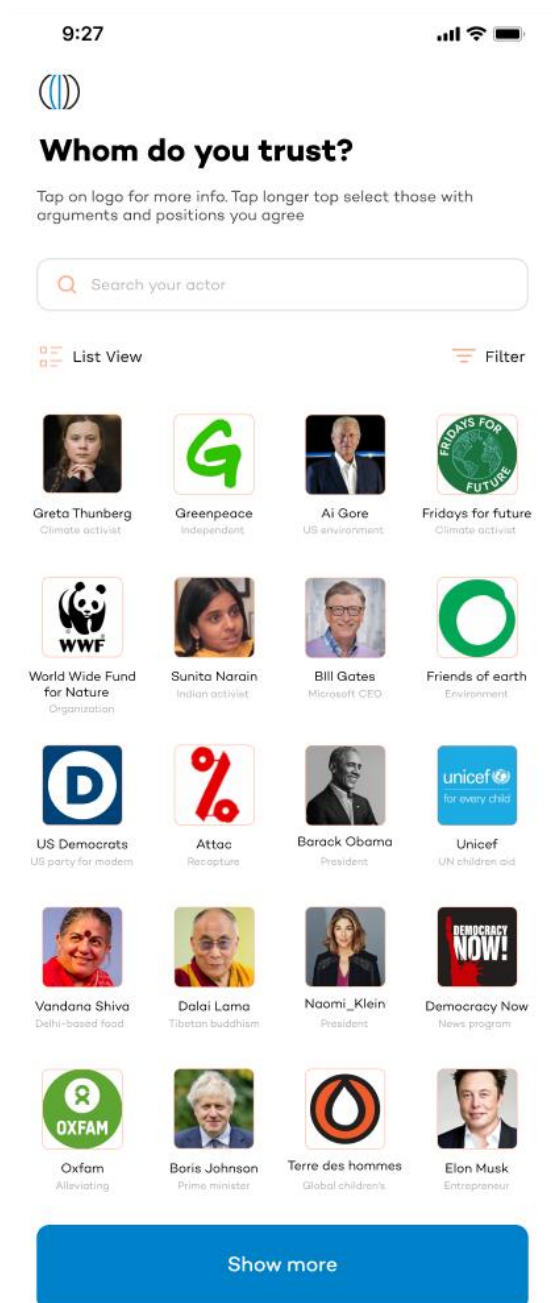
Note: This first screen is from a different stage of the earlier UI studies and does hence use slightly different visual conventions. Please see this as a reminder that these screens are not meant to represent the exact way the final screens shall look like!
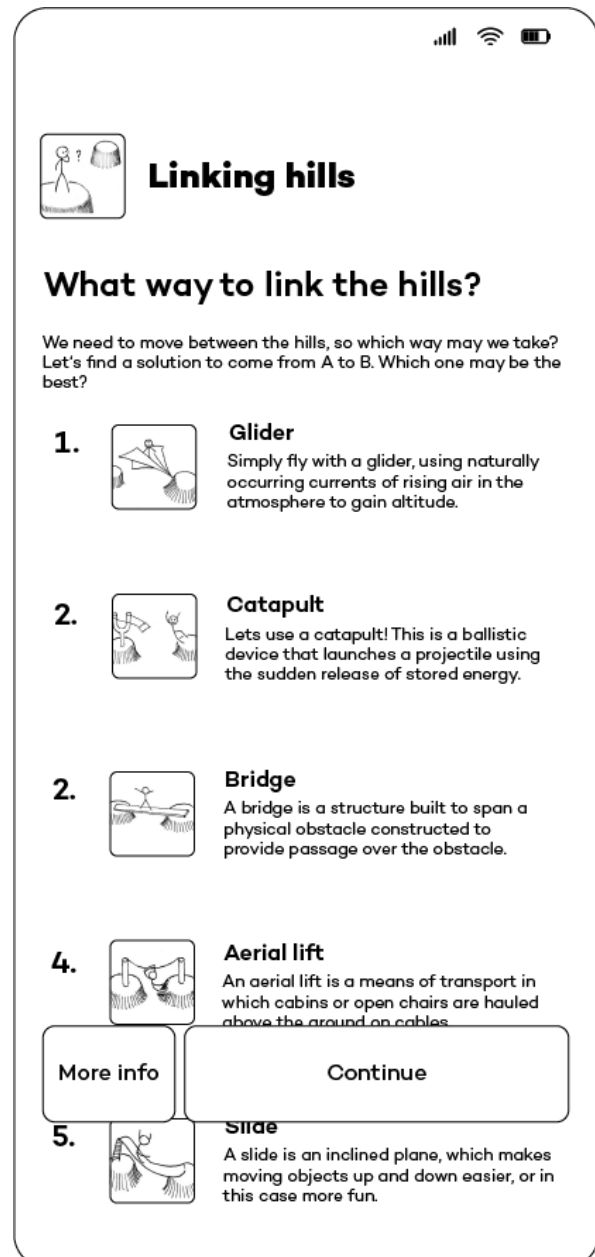
Partipation screen (full)

Linking hills

What way to link the hills?

We need to move between the hills, so which way may we take? Let's find a solution to come from A to B. Which one may be the best?

1.
44.4%

Glider
Simply fly with a glider, using naturally occurring currents of rising air in the atmosphere to gain altitude.

Diff:
100%

Preferring Glider:
„Simple and elegant" +17

Preferring Catapult:
„Better acceleration" +5

2.
22.2%

=

Catapult
Lets use a catapult! This is a ballistic device that launches a projectile using the sudden release of stored energy.

Preferring Catapult:
„Hilarious" +9

Preferring Bridge:
„Stable and cheap" +2

2.
22.2%

Bridge
A bridge is a structure built to span a physical obstacle constructed to provide passage over the obstacle.

Diff:
100%

Preferring Bridge:
„Higher performance" +24

Preferring Aerial lift:
„Great experience" +8

4.
11.1%

Aerial lift
An aerial lift is a means of transport in which cabins or open chairs are hauled above the ground on cables.

Less info	Continue

5.
0

=

Slide
A slide is an inclined plane, which makes moving objects up and down easier, or in this case more fun.

Preferring Slide over Yet another option:
Supported by: Opposed by:

Option comparison sheet

Linking hills
What way to link the hills?

Glider

Catapult

Simply fly with a glider, using naturally occurring currents of rising air in the atmosphere to gain altitude. Gliders benefit from producing the least drag for any given amount of lift, and this is best achieved ...

Lets use a catapult! This is a ballistic device that launches a projectile using the sudden release of stored energy. In the 1840s the invention of vulcanized rubber allowed the making of hand-held ...

Your current position: **1.**

Your current position: **2.**

Your trusted OAs preferring Glider:

Your trusted OAs preferring Catapult:

Other OAs preferring Glider:

Other OAs preferring Catapult:

Arguments for Glider over Catapult:

Arguments for Catapult over Glider:

„Hilarious"
„It is a hilarious way to travel with a glider - smooth, quiet, with great sight. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Donec quam felis, ultricies

„Better acceleration"
„The better acceleration stongly counts for the catapult. Sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus."

„Elegant"
„The aesthetics speak for the glider. Pellentesque eu, pretium quis, sem. Nulla consequat massa quis enim. Donec pede justo, fringilla vel, aliquet nec."

„Quick"
„Travel times are shorter using the catapult. Nullam dictum felis eu pede mollis pretium. Integer tincidunt. Cras dapibus. Vivamus elementum semper nisi."

Add an own argument

„Paper is a renewing resource"
„The glider is made of paper, a renewable and, after use, compostable resource. Nulla consequat massa quis enim. Donec pede justo, fringilla vel, aliquet nec."

„Familiarity from school"
„Using the glider is wellknown for us all from classroom experience. Everyone knows how

Continue

magnis dis parturient montes, nascetur ridiculus mus. Donec pede justo, fringilla vel,