



Project no. 610349

**D-CENT**

**Decentralised Citizens ENgagement Technologies**

Specific Targeted Research Project

Collective Awareness Platforms

## **D 5.1 Pilot Implementation of Open Social Web for Participatory Democracy**

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This report is currently awaiting approval from the EC and cannot be not considered to be a final version.

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# 1. Executive summary

## Decentralised tools for democratic participation

D-CENT (Decentralised Citizens Engagement Technologies) is a Europe-wide project creating privacy-aware tools and applications for direct democracy and economic empowerment. It is ecology of democracy tools for communities to share data, build collective intelligence, and organise.

D-CENT allows people to discuss and share content, engage in deliberation, collective judgments and voting. D-CENT is based on a **distributed, federated and privacy-aware social networking architecture**. The platform will include an **ecosystem of open source tools for direct democracy and collective intelligence**, including deliberation, collective debates, voting, citizen initiatives, collective creation of documents, political programs and laws, and collective selection and filtering algorithms.

## Modular, distributed and open source

The architecture of the D-CENT platform is modular and privacy-aware. It is based on open source software and open standards. The code is published on Github (<https://github.com/d-cent>).

## D-CENT principles

- community ownership of social data
- security and privacy by design
- open standards
- access to knowledge and open source
- mass scalability



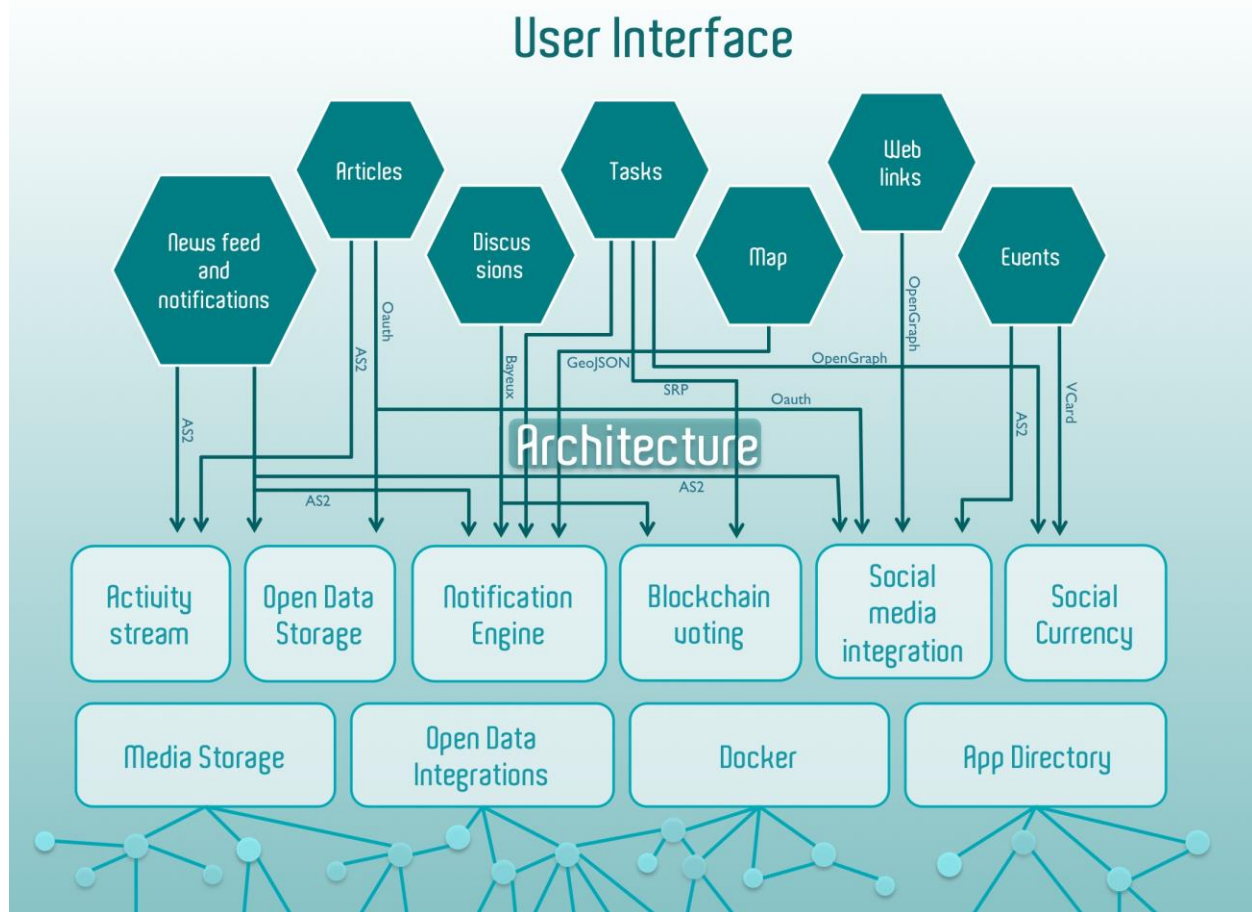


Fig. 1: Architecture of the D-CENT platform

The overall objective of WP5 is to implement the specifications into the full-fledged and mature D-CENT platform using a lean software development methodology across three pilots: Spain, Iceland, and Finland. The pilots will build around a federated social networking-based open-source infrastructure for participatory democracy (specifications given in D 4.3), yet each pilot will tailor D-CENT to their particular needs. This WP will conclude with a pan-European demonstration of interoperability between nodes. There will be three primary results:

- The implementation of D-CENT's core functionality and direct democracy module as specified in D 4.3 for the three pilot cases of the open social web for crowd-sourced democracy. D-CENT will follow a lean UX methodology, with fast iterations based on users needs and users feedback. Therefore the specification document is a reference architecture that will be constantly updated and each module tested, according to the pilots' requirements.
- The implementation of D-CENT's social digital currency and collaborative economy mechanism module, as will be specified in D4.4, with real world pilots.

- The implementation of standards-driven decentralised federation between all pilots to demonstrate the technical interoperability and the federation of the pilots, using the specifications described in D4.3 and developed by the W3C.

WP 5 will focus on implementation and pilots for the D-CENT platform, and will be led by ThoughtWorks. TW has extensive experience in Lean and Agile development and includes some of the same engineers that previously built highly usable and scalable platforms like Twitter. Working closely with the methodology outlined in T1.2, the implementation will use a “lean software development” approach, which iterates implementation rapidly with short user-feedback cycles as the pilots deploy the software. Thus implementation and actual piloting with users will be deeply interlinked and happen simultaneously. Although flexible, implementation will be guided by a careful project plan and detailed baseline specifications as given by WP4. Unit-testing, code comments, API documentation, and user-experience testing will happen throughout the project, along with regular releases of the open-source D-CENT code (initially on a development server and then via GitHub when deliverables are released).

As D-CENT is a web-based platform, it should work on any device with a web-browser. Testing of the web-facing D-CENT platform will happen over a variety of devices including all major browsers as well as Android and Apple smartphones. The software currently used by each pilot partner will either be loosely coupled via APIs or deeply integrated via Ruby or Javascript, a programming language specialising in quick iterations that is also capable of scaling (the original Twitter was designed in Ruby).

## Task 5.1: Participatory democracy Prototype

As this is the first implementation stage of the D-CENT platform, this is very large task as it involves three distinct components, which will be given as four different Deliverables associated with the other tasks in WP5. In the original DoW a *prototype of the decentralised social networking* was planned, with features identified in the gap analysis in WP4.2. However, currently the decentralization of social networking is happening in the **W3C Social Web Working Group** and the standards are not yet ready to be implemented (they will be ready at latest by T5.3).

Thus, we decided to re-focus this Task on providing the necessary functions for a single node of D-CENT that could then later be federated with other D-CENT nodes when the appropriate standards were ready. So we began engaging and testing democracy-based tools in a single node first rather than building decentralised networking tools. The decentralised social networking standards begun by W3C is described more in D4.3 and current progress is described in this report and documented in Annex 1 and Annex 2).

Given that the original technical partner for the task, Neo, was not validated, and a new technical partner ThoughtWorks just recently joined the Consortium, this Deliverable was repurposed to focus on testing

the hypothesis and requirements gathered by pilots groups, by deploying decision-making pilots and tests using existing open-source codebases and tools, such as DemocracyOS and Appgree.

Task 5.1 is focused on three main high-level objectives:

- **Engaging large scale communities of users in Spain, and Finland through iterative tests** analysing the democracy communication Ecosystem, their needs and the digital tools used to carry out Tasks and solve problems in their communities. This Task has received inputs from D1.2, and gathered new requirements and hypothesis that were tested during the live experiments. D-CENT has deeply engaged with Guanyem and Podemos in Spain (more than 900 people involved in the testing process with **DemocracyOS** and other tests with **Appgree**); with the City of Helsinki and the neighbourhood organisation HELKA in Helsinki, carrying out focused groups and tests targeted to increasing citizen's participation at City level; and finally with the Citizen Foundation in Iceland, upgrading Your Priorities platform, and testing it for decision-making and open budgeting in Reykjavik, Estonia and the UK. An analysis of the different tests and pilots performed will be documented here, together with an analysis of all the democracy tools used by the different D-CENT stakeholders groups, suggesting future pilots iterations.
- **Deployment of a Minimal Viable Product of D-CENT democracy prototype, building off an existing open-source codebase DemocracyOS**, will demonstrate the basic functionality of the D-CENT democracy platform, including new features given by the community requirements, such as collaborative annotations to documents, new users profiles, and collective comments of voting, activity stream, and a notification engine with users preferences. These features were tested with the user communities in the pilot projects, and are described in this Deliverable with links to the code on Github. This prototype will serve as one of the key tools that will be connected to the rest of the modules of the D-CENT platform.
- **A RoadMap for distributed social networking implementation based on the standardisation work lead by the W3C**. The open web standards are progressing well, due to the W3C set up of the Social Web Working Group. We provide here a summary of the RadMap towards implementation. We also attach the specifications to give details on the Working Group's work in the first review period: the W3C Activity Stream 2.0 first public working draft (Appendix I); and the Activity Stream Vocabulary (Appendix2). The W3C Activity Streams specification will serve as the core of the D-CENT platform (as described in detail in D4.3). This stream will be displayed visually for users to read as a newsfeed. They will also serve as the basis for federation between different D-CENT instances (or "nodes") that will be implemented later on during the project as part of T5.3. The standardization process and its implementation in D-CENT, together with a clear link to the D-CENT features to be implemented is described in detail in D4.3. We expect D-CENT to keep track and use or provide open-source implementations of these standards in the final D-CENT platform. As the standards change over time, we expect the D-CENT

codebase to keep up. As the standards are supposed to reach CR by end of 2015, the final D-CENT codebase should use stabilized W3C standards.

The future evolution of the prototype as defined in D4.3 (and in the original DoW planned to be implemented in this Deliverable) should include groups with access control, individual and group profile pages with “action/to-do” lists, individual and group-based messaging, wiki-editing for collaborative documents, all deeply integrated into the initial core open-source codebase. Also, Public keys, and digital signatures, should have to be integrated for both users and groups. Once the baseline codebase is up to standard, will focus on implementing OAuth-based integration with Twitter and Facebook through pulling user's data from centralised servers (such as copying personal tweets into D-CENT), implementing federated identity via social media log-ins (including as options an anonymously and email-based approach inspired by BrowserID to ensure privacy), and data-portability (using standards studied in in D4.1). These functionalities are described in detail in D4.3.

Given feedback gathered from the pilots, we expect some of the features above to be implemented by ThoughtWorks in the next Deliverable (D5.3) with the advantages of the “lean” software development. This meant that D5.1, rather than delivering a feature-rich pilot prototype of decentralised social networking, was focused on the validation of hypothesis and work to determine what the basis of a more mature D-CENT codebase based on pilot feedback would like in order to enable the new technical lead, ThoughtWorks, to develop a richer prototype in the next WP5 deliverable. In the long run, we still are following this plan in the second year of the project, although given the process of standardization for decentralised social networking at W3C has already made good progress and the fact that the lead technical partner Thoughtworks, has just started, the implementation of the new components will be delayed although the standards are currently being developed ahead of schedule.

Together with ThoughtWorks we are now in the process of prioritizing features within WP 5 and each application of the D-CENT platform will then be built integrating users feedback and requirements coming from the pilots during the testing phases. By engaging with early prototyping using DemocracyOS with Guanyem and Podemos in Spain, and with Helka and Open Ministry in Helsinki, valuable insights were gained that are described in this Deliverable that will inform the rest of the implementation. These insights will fuel the rest of WP 5.

## 2. D-CENT Participatory democracy Pilots description

### Lean UX development: from users' needs into features

In early 2014 we conducted workshops with communities of users to identify their needs. These were translated into the first D-CENT Minimal Viable Products (MVPs) for the D-CENT platform to be piloted further with communities in Spain, Finland and Iceland.



Fig.2: Pilot Minimal Viable Products and shared components

DOS has developed a full list of requirements for the Democracy App by synchronising and testing the Democracy App in the chosen use cases and pilot groups in Helsinki and Spain. The chosen use cases and pilot groups are as follows: <https://github.com/d-cent/democracyos/milestones>

## 2.1 D-CENT Pilots in Spain

### 2.1.1 Guanyem: a new citizens municipal coalition and its collaboration

#### with D-CENT

D-CENT's collaboration with citizen collectives and initiatives has already started. So far we have worked with two thematic circles of Podemos, and started collaborating with Guanyem Barcelona. In the following we explain both experiments.

The development of Spanish politics in recent years, since the rise of 15M, has produced an unprecedented politicization of people, cutting across the whole society, including even the traditionally conservative and apolitical sectors. The new politics are characterized by a prioritization of a real and direct democracy, in the hands and voices of citizens. This is what has led to the emergence of new citizens' coalitions such as Guanyem, and new political parties such as Podemos that has become the most supported Spanish party in direct voting intention polls, just some months after its appearance. The new way of doing politics in the new citizen movements in Spain, allows the strategies and tools developed in D-CENT to have an applications and experimentations with a number of people that has never been possible before, with the aim of extending them to city councils (as in Helsinki and Reykjavik), Regions and even the possibility of changing the democratic institutions at national and European level.

In May 2015, four years after the beginning of 15M, elections will be held in more than 8100 municipalities, and there are already citizen convergence candidacies at the local level all over Spain. This “*open source municipalism*” led by citizens proposes a democracy controllable by the people, and extends the desires for a new relationship between citizenry and democracy. This idea is embodied in the experiment “Guanyem Barcelona” (Let's win Barcelona) and is extending throughout the Spanish State, although with different levels of public impact. This is the list of “Ganemos” (translation of “Guanyem” into Spanish) at the state level, as of November 16th: <https://twitter.com/GanemosMadrid/lists/municipalismos>.

Guanyem is a political experiment about bottom-up democracy and open source municipalism. Today The Guanyem coalition is made up of 13 thematic Axes, 6 working Committees and around 15-20 neighborhood groups. There are we are more than 1000 volunteers that are participating on a daily basis. The citizen-led coalition is attempting to build a new type of city management, starting with the possibilities provided by technologies and open participatory processes. These citizen candidacies are



becoming serious options for catalysing and canalising outrage and aspirations for a better democracy into the 2015 local elections. These elections are situated at the centre of a political struggle between an empowered citizenry, activated by the 15M movement in 2011, and the Establishment parties. This is an excellent setting for experiments combining innovations in direct and deliberative democracy essayed during the last 3 years, as well as for a citizen re-appropriation of public decision-making about city policies. This map depicts a projection of the possibilities of municipal citizen lead projects for gaining their municipalities, based on past elections: <http://www.targetmap.com/viewer.aspx?reportId=36965>

by @NacionRotonda #MunicipalismoConstituyente #ConstituentMunicipalism

If the desire to participate in politics, in the daily management of neighborhoods and cities, has become a key citizen demand and a central element of a new politics, the design of the protocols, software and online participation processes become a key element in these processes. For this reason, D-CENT is collaborating with Guanyem's participation commission in order to provide digital tools and to adapt them to the needs of the processes carried out by the different Guanyem groups and projects. Other municipal initiatives will be able to use these tools elsewhere in Spain (or beyond, as shown by the collaboration between Spain and Finland), if the "Guanyem test" is successful. Democracy begins in proximity; it means to have the possibility to generate processes from the bottom-up, to interact with the City administration and to intervene in decision-making processes that affect all the inhabitants. To enhance citizens' participation means to multiply the interaction channels (be they online or offline, or better, an integration of both) where citizens are no more mere spectators of the representation of democracy, but rather actors and protagonists of City life.

## Software tools tested with Guanyem

### Appgree: On/offline hybridation, #GuanyemDialogant

Appgree is a software tool developed in Spain, which Podemos has popularized and that is now extending among municipal initiatives like Guanyem Barcelona (and is already used by Guanyem Terrasa and several Ganemos, like in Zaragoza, Sevilla, Valencia, Jerez and Cartagena). The tool is able to easily find what are the ideas or responses gathering the more support within a given group. The number of participants can range from one hundred to one million people.

It allows fast massive polls using smartphones and other devices. Appgree most important feature is to allow users to give open answers (meaning that they can write whatever they want, and not choose from a list). This possibility gets collective intelligence to a higher level. After answering, the users filter the answers, by using a statistical algorithm called demoRank that share the answers between the people. And finally the most approved answer is selected. In Guanyem Barcelona, the D-CENT Spanish team has supported the digital participation commission of Guanyem to test Appgree in order to ask about what is the Barcelona people want to build, and what are the most urgent measures for the City. A large-scale pilot started on September 16th and it has been documented here:

<https://guanyembarcelona.cat/es/estreno-del-canal-de-appgree-en-ara-toca-guanyar/>

One of the most innovative elements of Guanyem's Appgree use is the integration of participation mechanisms that include the gathering of paper responses by neighbours, followed by their inclusion in the general, digital database. This practice of multimodal participation (in physical places as well as on the Internet), is one of the main challenges for this bottom-up, transformative municipalism.

	Participants	Voters	Votes	Proposals
Guanyem App Gree	1332	732	9872	356
Q1: Quina Barcelona uolem?	522	460	4352	216
Q2: Quines mesures urgents necessita Barcelona?	599	499	5520	218

Table 1.

For a more detailed report of the results see:

[https://docs.google.com/document/d/1jTedN0rqv9fVtko6blaCnY\\_fsCRQwpd-IOV8WoNG73A/edit](https://docs.google.com/document/d/1jTedN0rqv9fVtko6blaCnY_fsCRQwpd-IOV8WoNG73A/edit)

Guanyem has also set up a space **#GuanyemDialogant** for real time conversation between citizens interested in the Guanyem project and Guanyem's thematic groups and spokespeople. Appgree is really novel when it comes to mobilising the opinion and collaboration of massive groups in real time, enabling not only one-to-many, but many-to-many conversations, although Appgree is not yet free software. However, due to the massive use by Podemos (see description below) and Guanyem, the company accepted to make an agreement to release the software with an open source license in a reasonable period of time. This is a crucial matter for the legitimacy and transparency of decisions and democratic participation, and a good opportunity for further collaboration with D-CENT.

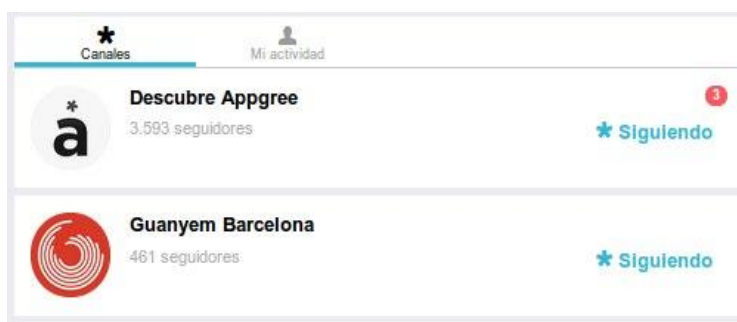


Fig. 3: Guanyem's Appgree



### DemocracyOS for the development of Guanyem's ethical code and the thematic axes

Another large scale test run with Guanyem Barcelona has been the participatory process that was launched to collectively construct **Guanyem's ethical code** <http://confluenciadietic.cat/es/participacion/> developed by the D-CENT DemocracyOS team accessible here: <http://participa.confluenciadietic.cat/>

DemocracyOS is a two-way platform for participatory democracy: bottom-up (citizens can present projects to be debated) and top-down (the representative presents for debate those bills currently in debate in Congress). DemocracyOS has three basic actions: "get informed," "join the conversation," and "vote." Furthermore new key features such as adding annotations to specific part of the text and a notification engine were added as requested by the user stories (see description of the code base and requirements in D4.2 and D4.3).

A test with DemocracyOS has been carried on during the process of public debate of this ethical code. The code embodies an agreement among different political forces that will run together in the 2015 city elections in Barcelona. A guide was provided, explaining how to use the tool, and published on Youtube, that was viewed 734 times: [https://www.youtube.com/watch?v=IEQ0D\\_BR6jA](https://www.youtube.com/watch?v=IEQ0D_BR6jA)

This tool was launched and tested during the very process of building Guanyem's ethical code. It hosted the ethical code text for two weeks, the time for citizens to introduce changes and amendments of its initial version, by using the annotation and comments functionalities of Democracyos documented in the next section of the document. The process gathered a considerable level of participation, especially given the type of document, **with 365 users involved**, of which **335 were email-validated**, and who introduced **321 comments, 957 ratings and 139 replies**. The demo will be presented during the project Review.

The next step has been for Guanyem to submit a second version (on the basis of the improvements introduced by the citizenry), which is now uploaded on the platform to get validation by the citizenry. As of November 29<sup>th</sup> over 800 people have already validated the text (see Fig. below).

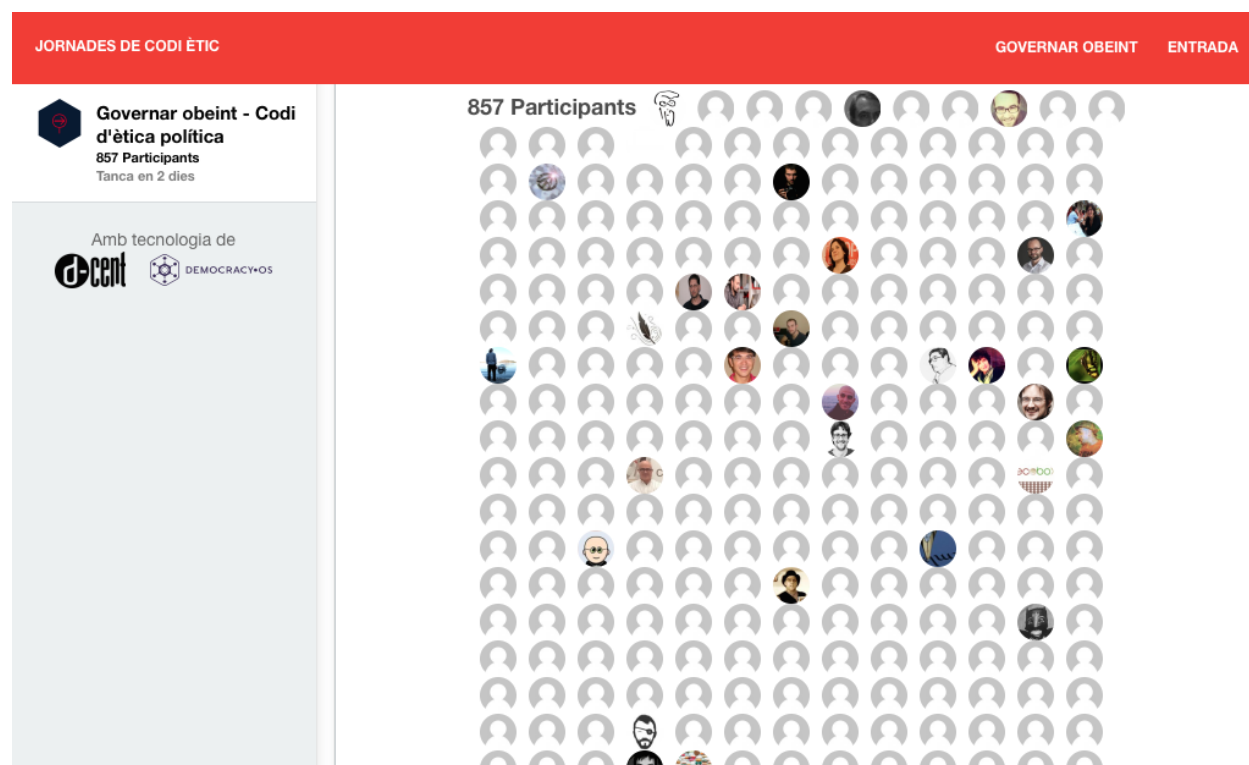


Fig 4: Validation of Ethical code, Guanyem DemocracyOS pilot

Another DemocracyOS instantiation is going to be set up for the development of Guanyem's thematic axes. This aims to facilitate the participatory work begun, on October 2014, on Guanyem's 13 content or thematic axes. This process groups hundreds of active and competent citizens that will build the political program of the candidacy. The work will be organised in commissions which will be open, in order to ensure that anyone can help to improve Guanyem's programmatic contents.

Pilot Groups/Tools	Participants	Comments/ proposals	Ratings	Replies to Arguments	Uotes
Guanyemos/DyOS Ethical code	365	321	957	139	831

Table 2: Stats of the Ethical code test

All the of DemocracyOS code released for this pilot are documented here, with all the work on the code that involved translation into Catalan, improvements to the admin, and to the notifications to be able to delete annotations by the admin etc.:

<https://github.com/GuanyemBarcelona/democracyos/blob/development/History.md>

and all the commits are documented here:

<https://github.com/GuanyemBarcelona/democracyos/commits/development>



Fig. 5: Screenshot of Guanyem DemocracyOS pilot

## Future iteration of the Guanyem Pilot: A decentralised and open ecosystem of applications for bottom-up municipal democracy

During the next 3-4 months, Guanyem has to face the challenge of structuring itself in the midst of an exponential growth, with a membership that already exceeds one thousand people in each neighbourhoods, commissions, thematic axes groups: <https://guanyembarcelona.cat/participa/>. This members base currently comprises around **30000 people**, out of which 20000 live in Barcelona, with expectation for the number to triple. Guanyem is developing its organization with a view to include digital participation and bottom-up democracy, neighbourhood participation and public involvement in the key decisions of the organization, and the facilitation of mechanisms for online collective deliberation, for both surveying and interacting with the citizenry. It is a strategic requirement to achieve a qualitative leap in the information integration as we as in the connectivity of Guanyem's digital structure. That implies to make software tools accessible (with priority to smartphones) and highly usable for Guanyem's social base. For this reason, it is very important that all registered people have the possibility to access, via smartphone and using a single application, the main software functionalities and tools. The integration of functionalities and tools into an app for this emerging, bottom-up municipalism will increase the

possibilities of information and participation for a critical mass of networked citizens. This organizational structure (see Figure 6 below) is being built along with the infrastructures and protocols, and have great potential to experiment participatory democracy tools.

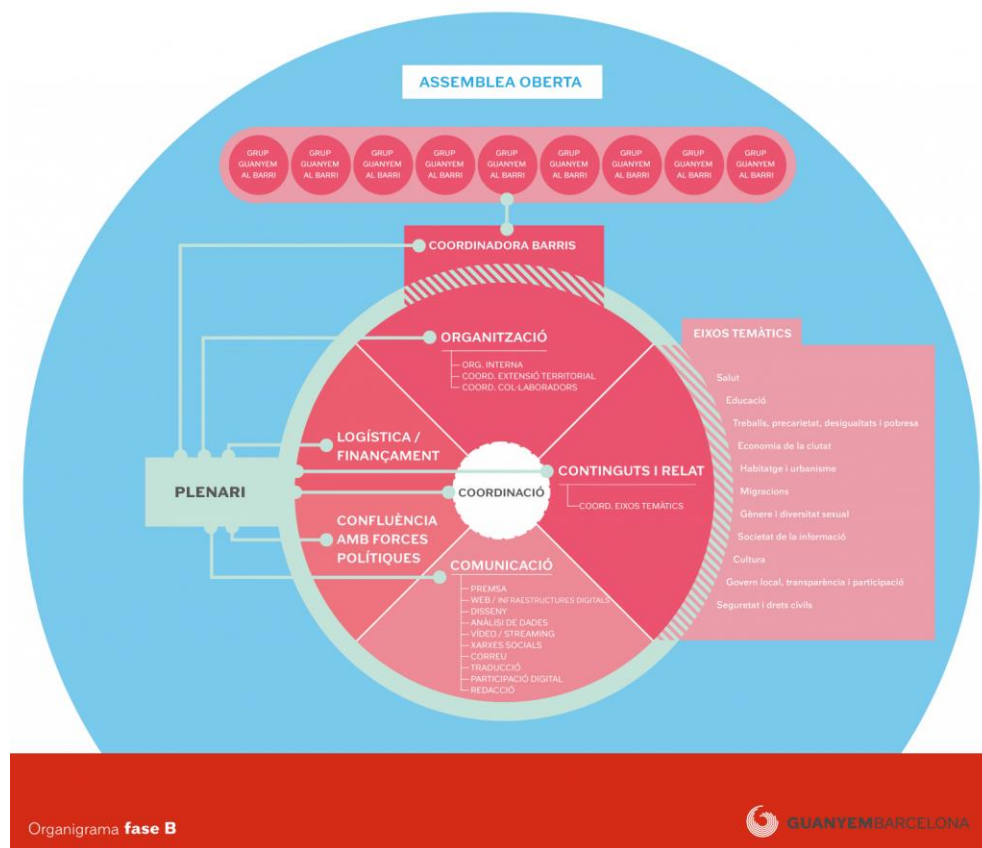


Fig.6: Guyanem, citizen coalition organisational structure

## 2.1.2 Tests of direct democracy tools by Podemos

We already described in detail in D4.3 the collaboration with two circles of Podemos (Podemos Ciencia and Podemos I+D) that was a very positive experiment, and we summarise again here some of the main feedback received by that experiment. After this experiments, and due to the growth of citizens participation within Podemos, D-CENT the D-CENT Consortium started a more structured collaboration for future pilots iteration.

Laboratorio Democratico (LaboDemo) is the organisation that is driving the participatory infrastructure of Podemos, and is the core of the Participation Team of Podemos. LaboDemo is an organisation dedicated

to consultancy, design of strategies and implementation of digital tools, online participatory processes and collective work, and development of new tools to expand the boundaries of these areas. A detailed analysis of the different participation strategies developed was performed and documented in this Section of the report.

In recent years LaboDemo has participated in the most relevant Spanish experiences of direct democracy and collective intelligence developments emerged from the 15M movement, such as pioneering initiatives such as the "**Urnas Indignadas**" ("outraged ballot boxes"). The project was able to collect and categorize **14,679 citizen proposals**. Amongst many other initiatives, they have also have participated in the development of "**Congreso Transparente**", where the member of Parliament Joan Baldoví gave his vote in the Congress of Deputies representing the decision taken by the citizens by using the secure voting system Agora Voting. This is the first experience of direct democracy held in Spain at the highest institutional level. In the last months, since the emergence of the new political party Podemos, Labo Demo is focusing on this project, designing, implementing and managing their current strategy of participation, which represent a particularly interesting case for the D-CENT project.

The local structure of Podemos is organised through assembly groups called **Circles** that anyone can form. It is the part of the party directly inherited from the 15M movement, and makes an important internal difference compared to the way other traditional parties are organised. Currently there are around a thousand circles, so it is essential that these have adequate tools for operation.

For the purpose of internal communication of the Circles, **Loomio** was chosen (<http://loomio.org>). This tool is designed in the Occupy movement in New Zealand, by participants in the assemblies who felt the need for a digital tool suitable for the work done in the squares. The traffic generated by the Podemos Circles corresponds to more than half of the global traffic of the tool. (see <https://www.loomio.org/explore>). Loomio works well for internal decision-making. People can debate and reach consensus in a very simple way: at the same time the debate is happening a proposal can be opened so people can vote and everyone is aware of which is the feeling of the group, and thus tyranny of the most involved is disabled. Loomio is designed to find not the fastest decision but the consensus decision and also to have transparent decision processes. Everyone in the group can access Loomio and follow the decision process, the discussion and the quantitative support of each proposal.

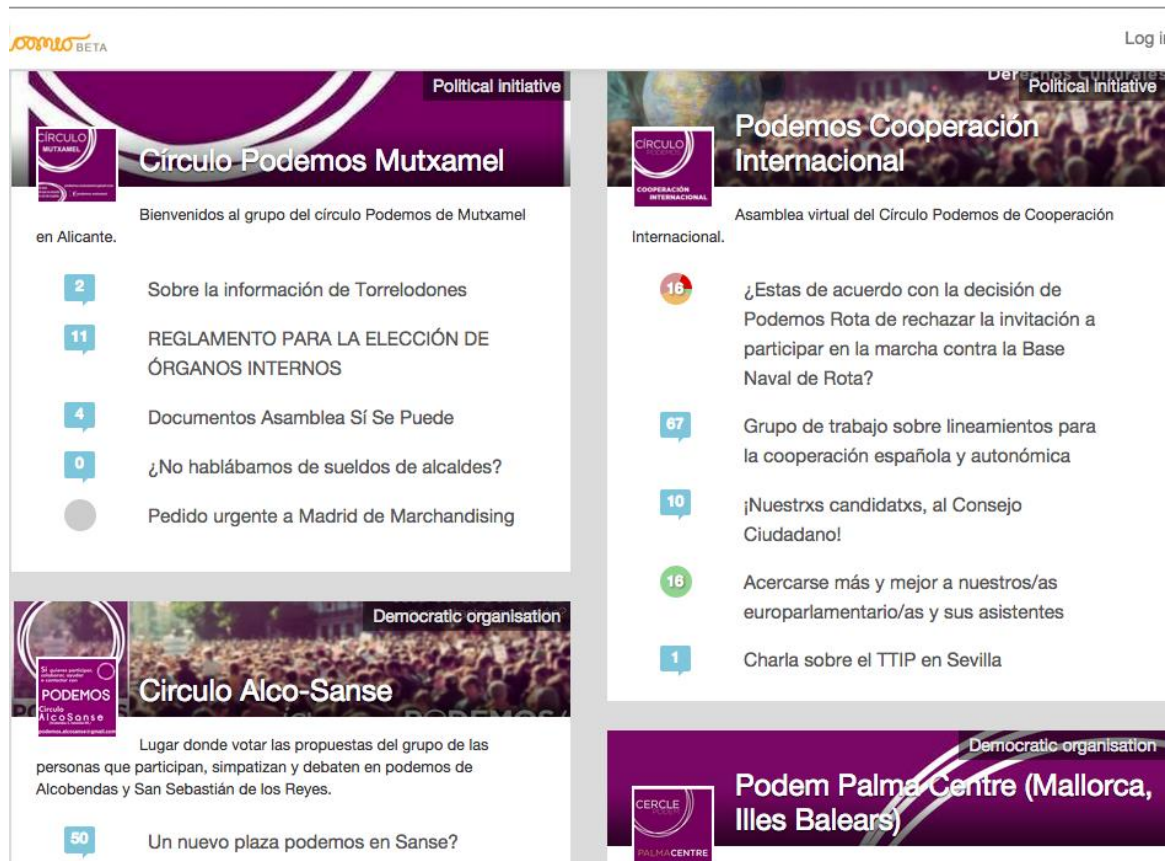


Fig. 7: Screenshot of Podemos Loomio platform

At a global level, Podemos has focused on three tools: **Reddit, Appgree and Agora Voting.**

Below we have performed an analysis of these tools and the current usage:

- **Reddit** is the actual core of the participation in Podemos, through the space we launched last July called "Plaza Podemos" (Podemos Square) (<http://plaza.podemos.info>). The daily average attendance is **15,000 unique visitors**, with more than **270,000 unique visitors** and more than 2,625,000 page view during October. – Highly relevant figures, especially considering that Podemos has a total of **220,000 registered people**. This is the first time a political party has used Reddit in this way.

Reddit was chosen as the central meeting space: the collective uploading and filtering of content, which leverages collective intelligence by avoiding the need for intermediaries to organize or limit the debate; the tree structure of the discussion system with the possibility of collapsing branches, to avoid loop arguments and to highlight the most relevant comments; the temporal filtering, key vector in a discussion forum linked to the daily political reality; and the fact of



being free software and the activist profile of its founders, with the reliability that this implies compared with the rest of the mainstream social networks. The strategy has been focused in Reddit trying to maximize the potential of joining all the people that participates in Podemos in one common space , rather than splitting it.

Among the different dynamics launched, we can mention the "**RuedasDeMasas**" (similar to 'IAmA' on Reddit), where the people directly launch questions to the members or teams of Podemos (with some of them concentrating a huge activity, as the one made by the leader of Podemos Pablo Iglesias, in which more than **70,000 people participated**, with more that **2,800 questions and comments**); the "**#PreguntaAPodemos**" (**ask to Podemos**), that establish a permanent channel between citizens and elected members, to ask them about any of their actions; "**Voces de Plaza Podemos**" (voices of Podemos square), where we gather a weekly selection of the top rated posts in each category (proposals, debates, etc.) to obtain a broader vision of the voice that is generated in this space, and for creating something that everyone can follow more easily.

- **Appgree** (<http://www.appgree.com/>) is another global tool born some years ago in Spain, already documented above in the Guanyem case. At **Podemos Citizen Assembly** more than **8,000 people** at the meeting and **15,000 following it by streaming** participated at the same time thanks to Appgree. They made questions to different political teams and selected the more interesting ones. Besides that, LaboDemo designed a new dynamic were people asked themselves as a group, as the whole party, and then after the selection of the best questions, the whole group answered them. So there was a dialog between Podemos followers independent of leaders in a unique direct democracy experience.
- **Agora Voting** is the third of the global tools used by Podemos. It is a free software platform developed by a group of Spanish programmers and experts in cryptography and computer security. Agora Voting is a unique tool for secure voting in the international arena, used by several political parties, and now in an extensive way by Podemos, being the tool that has allowed to do all the important voting processes, including the electoral lists and the election of charges and internal party statutes, among others. Agora Voting not only features advanced cryptographic security measures to ensure the validity of the processes, but also assesses all the voting processes with the collaboration of different independent entities to achieve maximum robustness, and gives the possibility of verifying the votes counting by any participant, as well as the verification of any particular vote by the person that made it.
- **DemocracyOS** was tested by Podemos for internal decision-making in their virtual assemblies starting in the month of July. The aim of the assembly was to define the function and working methods of the "Science Circle" group (See here for the rules followed by the Assembly. The items on the left side-bar in the table of metrics below were proposals and items on the meeting agenda, that had been put up for discussion and voting.

Proposal	Participants	# of votes	Arguments	Replies to arguments
Basic Agreement	88	83	25	13
Tools working group	66	64	7	6
Debate working group	72	72	8	3
News working group	66	65	10	3
Reports working group	73	70	8	7
Social network working group	71	71	7	2
Translation working group	74	71	13	6
Suggestions	42	34	14	8
Modify point 3 of...	54	51	9	5
Change point 6 to...	60	57	9	5
Change the name...	56	53	12	4
Add	62	61	5	3
Contact multipliers	46	44	10	4
Use of sources in reports	50	49	4	1
Bring together these points	26	26	0	0
Change the name to...	21	20	2	1
Dissemination	24	24	3	1

	Green manual	Chat	Actions	News
Average	56	54	8	4

Table 3: Podemos/DemocracyOS tests



**Analysis of the test and main feedback**

- Participation decreases: first proposals are voted and commented on more than later ones.
- First proposal has three times more votes than the last one.
- From the 17 proposals, 9 have more participation than the average and from those 9, 7 are the show up first when filtered by “oldest first”
- Relationship between arguments and replied to arguments is 2-1. In particular, in 3 proposals have almost 100% interaction between users (in terms of arguments being replied to). This probably has to do with the content.
- Relationship between users and votes cast: is almost the same.
- The relationship between votes and arguments is interesting: Looking at the average figures, participation is much higher in voting than in discussion. This may be related to content, however, it is noteworthy for this use-case because it is an assembly where one goes to debate, not just to vote.

**Other observations**

The most interesting point is the use of an emergent bottom-up approach with what the tool provided. They naturally used markdown, they didn't add links/pictures/videos. After a couple of hours they were already using all the features, commenting, replying and voting.

A questionnaire was put to the participants with more detailed feedback. These are attached in the Appendix 2, and have been incorporated into the overall feedback questions in 3.1 on page 40, which will be explored through a combination of metrics and questionnaires in the future pilots.

## 2.1.2 Current challenges and future requirements for the next Pilot iterations in Spain: Guanyem and Podemos

The present situation and the democratic experiments happening in Spain offer a unique window of opportunity for progress in the area of direct democracy and citizens' engagement. In this context, D-CENT goal is to accompany the bottom-up processes that are occurring, supplying them with the needed digital tools, as well as going beyond existing tools. This means designing and developing new distributed and privacy-aware social networking platforms for interaction that allow us to tackle current problems in radically new ways, exploiting the new power of citizen interaction and collective deliberation.

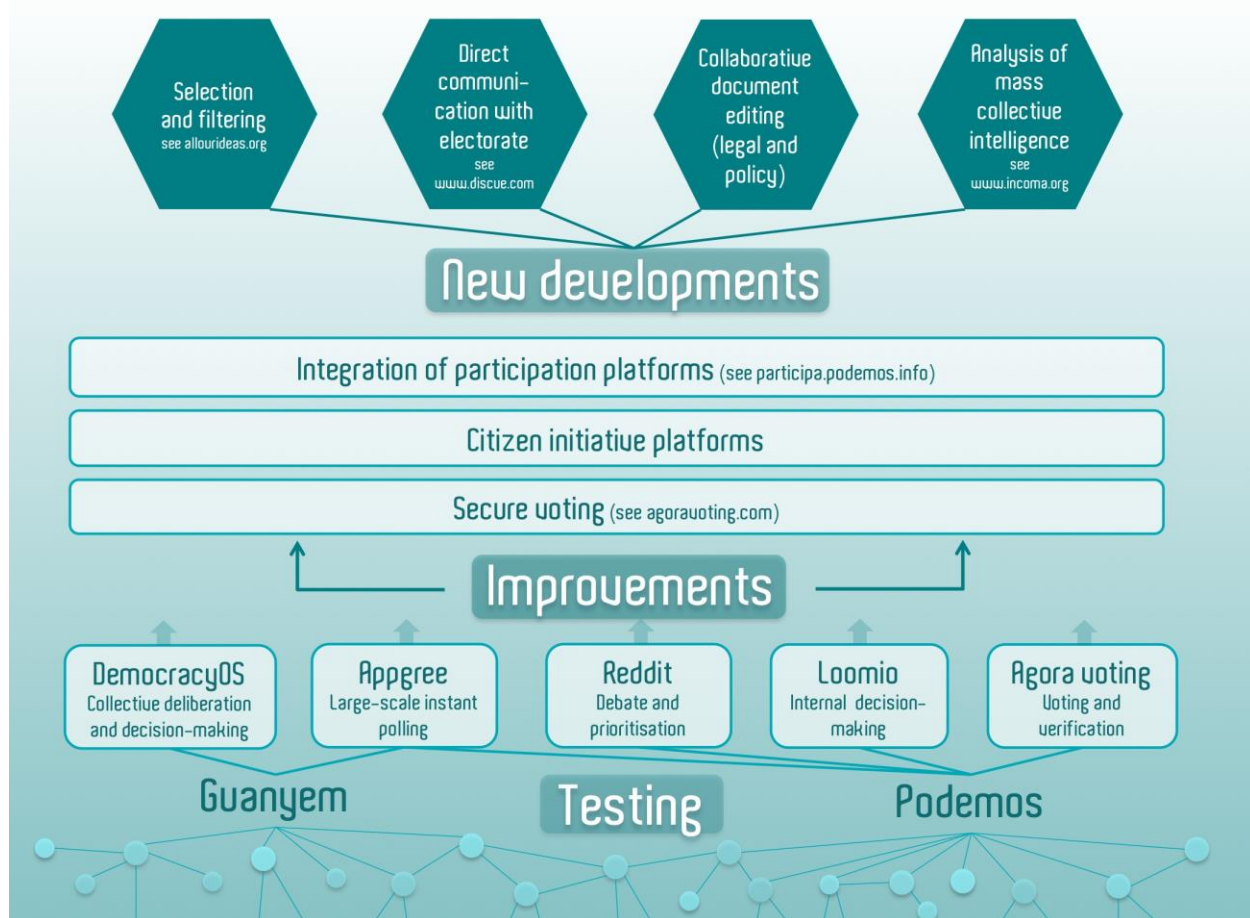


Fig. 8: Spanish pilot testing, improvements and new developments

We describe here a series of developments that are now considered by ThoughtWorks as options carry out (in particular within T5.3) following the outlined analysis of community requirements and integrating the feedback from the first tests:

Firstly, we will develop tools and features that are essential to enhance and scale processes that are already happening, in order to continue carrying out large scale pilots with Guanyem and Podemos:

- **Integrated Participation platform:** It is a strategic requirement to achieve a qualitative leap in the information integration and connectivity of the digital structure of each organization. That implies to make software tools accessible (with priority to smartphones) and highly usable for the social base. For this reason, it is very important that all registered people have the possibility to access, via pc or smartphone and using a single application, to the main software functionalities and tools needed for their organisational and decision-making processes. The **integration of functionalities and tools into a single app** will increase the possibilities of information and participation for a critical mass of networked citizens.

The minimum requirement of a participation platform should include: (i) the ability to create a supporters census with some verification system (e.g via mobile); (ii) the possibility for subscribers to access and modify their data; (iv) the connection of this census with a secure voting platform.

Beyond this, this platform should include additional developments to enhance interaction with citizens such as: geolocalised maps, calendars, public internal microblogging, rss news of the public channels, etc. The minimum version of this platform is currently being developed by **Alabs** (<https://alabs.org>) for its use in Podemos and the code will soon be released with open licensing. ThoughtWorks will work with Alabs to evaluate the possibility to add new features and improve the existing code (<https://participa.podemos.info>), so it can be reused for Guanyem and other groups.

- **Secure voting:** To make secure voting and to certify users is a basic necessity in a process of direct democracy (see analysis in D4.3). Current technology still makes each voting complex, resulting in a very expensive process that is difficult to extend to different levels of government, from the local level until the national or even European level. The further development of current existing software is necessary to solve this difficulty. The currently used software in Spain at a national level is **Agora Voting** that is currently being improved to meet the above shortcomings, allowing independent installation and administration by any group.
- **Citizen initiatives platforms:** Citizens should have direct involvement in the political process, being able to propose and approve initiatives. Processes that allow this within organisations have been designed such as the Podemos Citizen Initiative. Alabs is currently designing a platform that could be easily exportable to other political groups. It will include participatory mechanisms that start in Plaza Podemos, Citizens initiatives still aim to gather 0.2% of consensus from subscribers. If the initiative gets more than 0.2% votes of the subscribers, an email to every member of the

party will be sent, asking for a consultation. If more than 10% of the party members vote in favour of the proposal, there will be a binding referendum.

Being these three proposals a priority, they are already being developed within existing organizations, including the release of the code as free software. However, it is essential for D-CENT to keep close contact with the developers and to monitor the development of the tools, so that further development can be made to expand their functionalities or fill gaps (especially concerning the widespread use outside these organizations), producing more complete versions of these tools within the D-CENT project.

Secondly, we consider developments that are not currently taking place, but that would create new political processes or extend the citizen political impact beyond the current state of the art.

- **Analysis of mass collective intelligence.** The current global participation platforms have been designed with the usual old patterns of interaction among small groups (just large collections of text blocks) or simplifying interactions to extremely basic processes for large groups (sharing information, evaluating positively or negatively, etc.). When attempting to perform complex processes with large numbers of people, as maintaining complex debates, writing large documents, etc. even with relatively small numbers of the order of hundreds or thousands, these platforms fail, and it is virtually impossible to develop these processes between the noise and the complexity. The most advanced global platform that we have analysed and tested, **Plaza Podemos**, proves the impossibility to interpret meaningful interaction in threads with several hundreds of comments, or in complex processes such as the recent creation and collective debate of the party statutes. LaboDemo has developed a first prototype called Incoma, which can be found in <http://incoma.org> showing the first steps in the direction of improving collective intelligence tools. Together with LaboDemo we will analyse and test this development that could be easily implemented in all the global debate spaces in the organizations and allow to create strong connections between them.
- **Collective creation of documents, political programs and laws:** One of the most difficult and recurrent situations is the collective creation of documents by a large number of people. Tools like Etherpad or annotations, as the one implemented in the DemocracyOS codebase (see Fig. 5) allow writing or proofreading in a collective way, but fail when the number of participants is large or when the processes are more complex, such as merging large amount of complex texts into one in a democratic way. It would be possible to start from any of the above tools, such as the already piloted **DemocracyOS**, and carry out a development to solve some of the problems. Both the overall text and the specific paragraphs comment system could be modified to introduce features that would allow scaling the number of participants: a tree structure for comments, the possibility of collapsing trees and a user system allowing to vote comments to select the most important ones. This redefinition of proofreading could be complemented combining it with collective writing. The commented version of a text could be modified by the authors, showing a

second version (and the comparison with the first one), which could again be commented, producing a text development system similar to the software used to develop collaborative software.

- **Continuous, simple and direct communication channels between representatives or members of government institutions and citizens:** Direct communication with citizens is still limited to the will of the representatives, and is done through channels that have not been specifically designed for it. To develop this communication would have a very positive impact on the democratic quality of all institutions. In particular we propose to create a tool that would allow interaction via webcam between representatives and citizens. A website where anyone could connect and it could be switched between different users videoconferences (controlled by the moderator of the channel, or a voting system by the users). This would allow collective discussions where any person (without a limit of people) could participate, in a unmediated and uncensored interaction with his representatives. In addition, to enhancing already existing dynamics as the collective interviews (although now are done using only text), the tool would allow new dynamics as collective discussions among citizens themselves, candidates selection, etc. For example the platform used in **www.discue.com** is a good example of this type of tool (although in this case does not allow the discussion of two persons and it is not free software).
- **Selection platforms:** Currently part of the limitation of the massive processes is the ability of selection and filtering of the tools. Appgree is a good example of a platform that enables entirely new dynamics just by introducing a different selection process. Our goal would be to develop a new application with other selection processes. Specifically, we are interested in pairwise comparisons filtering, as done for example in the tool **allourideas.org**, a process that provides much more information than simple approval, and allows an easier participation by avoiding the overflow of information. This tool would be very useful for processes such as candidate's selection, priorities selection within a list of proposals, program development, etc. Also serve as a seed from which other filter systems could be added in the future, increasing the capacity of it, using a free software tool.

## 3. Finland

D-CENT's collaboration with citizen collectives and initiatives in Finland has been well prepared and has for many parts already started. So far we have worked with one main use group, Helka, and progressed with other user groups (the youth activists, citizen initiative campaigns in Open Ministry, and the City of Helsinki). The progress up to date of the three variations of the pilots - as layed out in D4.3 - is explained in the following sections.

### 3.1 Open Ministry – Crowdsourcing Tools for Citizens Initiatives

The first pilot is the crowd-sourcing tool for citizens activism. Here we have proceeded on multiple fronts, but have chosen to prioritize the co-operation with Helka, the local neighbourhoods activists.

#### 3.1.1 Helka

Helsinki Neighbourhoods Association, i.e. Helka ry, is the focal point for 80 neighbourhood associations in Helsinki. Helka is politically and religiously unaffiliated non-governmental organisation. Helka's values include openness, fairness, equality, community building and sustainable development (For specific social requirements, see D1.2 Finnish personas and hypothesis).

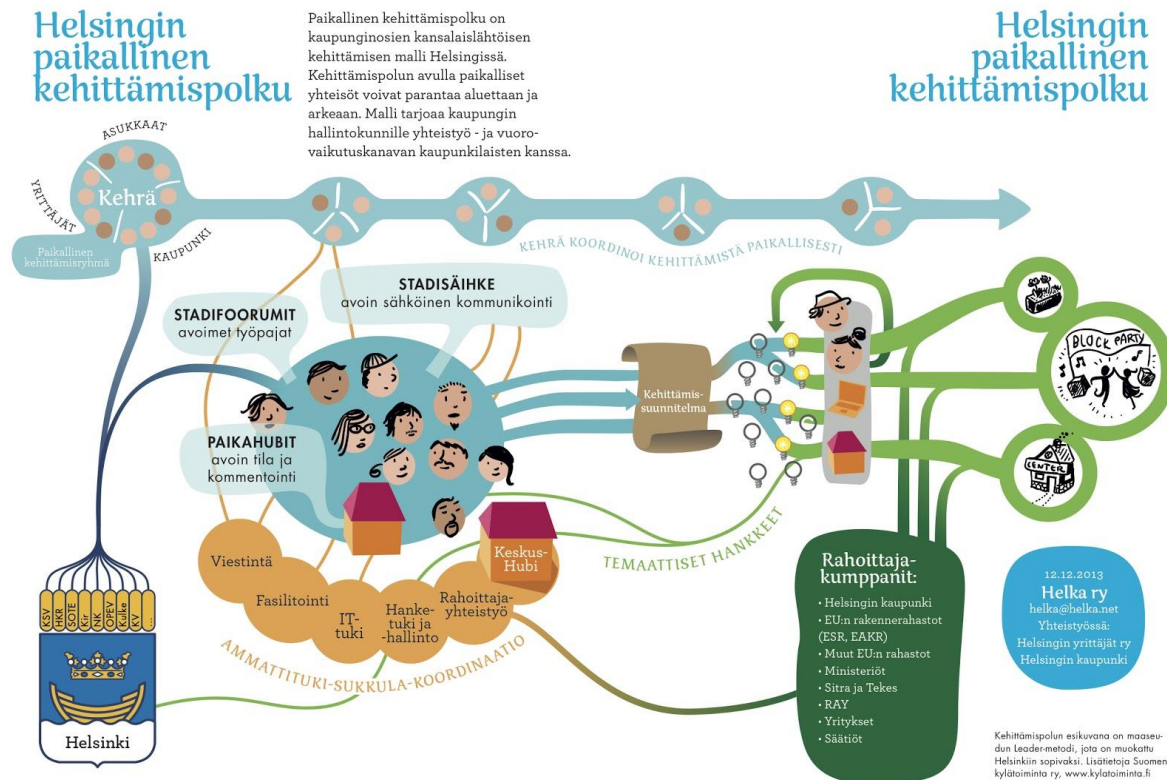
Helka was founded in 1964. Its mission is to activate and bring together residents and local actors in the Helsinki City area. Central task of Helka is to convey information and to enhance dialogue between the City of Helsinki and its residents. With the ongoing support from Helsinki City Government Helka has established a city-wide network of neighbourhood web pages.

(<http://kaupunginosat.net/portal/index.php/ko>), after over a decade of experimentation and pilot work. Helka's aim is to strengthen the opportunities for local participation and interaction in Helsinki.

#### Planned pilot

Helka is implementing a new process to improve the way local neighbourhood groups collaborate - linking local entrepreneurs and the civil servants in to the process from the beginning. The process ("paikallinen kehittämispolku" depicted below in Figure 9) has been piloted and is being rolled out, but has so far functioned mostly offline, i.e. in the physical space. A tool that enables online collaboration for such self-coordinated groups has been missing. D-CENT is well timed to provide the needed basic functionality for HELKA. As an open source project, Helka may continue to develop the specific functionality in the coming years, if and when additional user needs arise.





*Fig. 9: A depiction of the Helka partnership model where local communities including inhabitants, local entrepreneurs and civil servants co-create City plans*

This pilot will enable citizens to:

- Create projects and interest groups around certain thematic areas (e.g. municipal suggestions on how to improve the neighbourhood or the municipality, arranging a local garden party or flea market, etc).
- Invite friends and share the project (including sharing to other social media)
- Create co-edited and co-annotated documents (such as event planning documents, marketing materials, press releases, FOI requests, law proposals)
- Create and assign tasks among group members (i.e. for the campaign core group to manage their internal work flow)

## Steps taken up to date

- Helka project coordinators are involved closely in the project - contact / meetings every 1-2 weeks through out the project.
- We have helped Helka to recruit a technical team member, who has now acquainted himself with the D-CENT project and is ready to act as local technical support to roll-out the features of the platform to test users in the neighbourhood groups as the projects matures
- A Finnish language instance of the pilot platform (based on the DemocracyOS cadebase) was set up at <http://finnish-democracyos.herokuapp.com/>



Fig. 10: Finnish DemocracyOS pilot screenshot

- A test session for the activists from various neighborhoods has been scheduled for Dec 8th. The local early-adopter activists will spread information about the platform to their local communities.
- Success of the test will be measured with: number of documents, annotations and comments per document, number of signups, etc. We will also submit a survey to the users, to gather feedback on the user-interface and on the various features implemented.
- The documents will be local citizen led project plans and other documents, that are of interest to the local communities to discuss and comment



## 3.2 Progress with Other Finnish Pilots

Cooperation with Helka has been prioritized, but other user groups and use cases for the D-CENT tools have been actively kept up to date on the progress and are waiting to test the tools as soon as group functionality and co-editing features are implemented.

### 3.2.1 Open Ministry and Citizens Initiatives

Open Ministry has been helping citizen campaigns put law proposals into Parliament since a constitutional amendment made it possible in 2012. It has been involved in 5 of the 6 initiatives that have so far reached the 50 000 supporter threshold and have been handed into Parliament.

On November 28th 2014 the biggest initiative to date and one launched from the Open Ministry became the first citizen initiative in history to be accepted by the Parliament. The Finnish Parliament voted 105 “in favour” and 92 “against” for the equal marriage law proposal giving gays and lesbians equal marriage rights.



*Fig. 11: Thousands of people gathered on the Citizen Square on Nov 28th to support the Citizens Initiative as it was discussed across the street in Parliament*

Other initiatives have been rejected by the Parliament so far. This win has big implications for the citizens’ activism in Finland. People have seen that their digital participation (157 thousand of the 166 thousand supporters were online signatures) can make a difference. This may also give more credibility to future citizens’ initiative campaign in Finland.

The D-CENT tools will be rolled out to citizens planning and executing their campaigns during 2015. Open Ministry is actively working with several large campaigns - including one to “*Stop Irresponsible Arms Trade*” to be launched in the first quarter of 2015.

### 3.2.2 Youth activists

The Helsinki City Youth Department is active in promoting youth activism. They have a core group called Ruuti, where youngsters from across the city are elected by their peers. The core group makes decisions and functions to a large part offline, but D-CENT could provide the core group - and the larger youth population when important topics arise - the tools for deepening and strengthening online collaboration and decision-making.



[Hel.fi home page](#)

[Youth Department >](#)

#### Activities

[Advice and guidance](#)

[Events](#)

[Youth centres](#)

[Work and practice](#)

[Take part](#)

[Civic Activity](#)

[About us](#)

[Contacts and feedback](#)



### **Vote in the election of the Ruuti core group 2014**

Welcome to choosing the new Ruuti core group. You can take part in choosing the group of twenty young people who will take forward the matters of the youth in Helsinki. The core group consists of 13-17-year-old young people and it is chosen through an election every fall for one year. [Read more](#)

Fig. 12: Screenshot of Youth Department website

We have had a number of meetings to plan how D-CENT could help the active youth representatives work online in 2015, but actual kicking off the pilots is awaiting the group functionalities.

### 3.2.3 The Office for Rapid Action

Nopean toiminna virasto - or the “Office for Rapid Action”, <https://www.facebook.com/nopeantoiminnavirasto/> - is a citizen movement supported by the main local radio channel. It is a joint project by citizen activist and local politicians (across the political spectrum) aiming to improve dialogue between citizens, politicians and civil servants and to speed up improvements in the way the city works and how the inhabitants fare. We are working together with the “Office” to make sure D-CENT tools are adopted widely by everyone involved. We have met several times and the activists (citizens and politicians) have helped put together a list of key people to keep up to date in the City Council, in the key city offices and on the citizen activist side.

### 3.2.4 Others

The tools and features described in the first pilot are also awaited by a large and growing number of other activists and groups. Open Knowledge Finland with its large number of active and self-organised working groups is a natural user group. The “Citizen” movement - a side-shoot from the Made in Kallio -group, the local time-banking community (<http://stadinaikapankki.wordpress.com/>) and the Community Supported Agriculture co-operative “Kaupunkilaisten Oma Peltö” <http://ruokaosuuskunta.fi/> are eager pilot users among many others. There are also initial plans for launching a new political party inspired by the success of Podemos and Guanyem in Spain. The parliamentary election in Finland will take place in April 2015.

## 3.3 Helsinki City – Grassroots Action to Helsinki City Decisions

As described in D4.3 the city’s API with all City Council and board agenda and decision items will act as a source of notifications to be pushed to users interested in e.g. things happening in their neighbourhood or new bicycle lanes in general. This pilot is starting in the beginning of December, integrating the open decision-making API with the DemocracyOS notification engine as described in D4.3 and below in the feature description. More work and tests on this pilot will happen when the technical partner ThoughtWorks, will be more involved in the project, starting from January 2015.

## 3.4 Helsinki City – Public Consultation Service

The third pilot described in D4.3 is the City’s own consultation service. We are co-operating with the programmers at the Helsinki city council. They are building a pilot version of a new consultation platform. We have planned that the next evolution of the platform would be based on D-CENT technologies, but the plans and timetables are not yet define

## 4. Iceland

### Your Priorities running experiments

#### 4.1 Better Reykjavik

People who have participated out of a population of 120 000 since Better Reykjavik opened	More than 70 000
Top priorities processed by Reykjavik City Council and voted upon at meetings	10-15 pr. month
Number of ideas submitted by registered users	More than 3 300
Number of for/ against discussion items submitted by registered users	More than 5 500
Number of ideas formally reviewed since 2011	257
Number of ideas accepted since 2011	165

Table 4.

Better Reykjavik was the first successful example of the Your Priorities platform. It enables citizens to voice, debate and prioritize ideas to improve their city, creating open discourse between community members and city council and also giving the voters a direct influence on decision making.



The website was launched in 2010, a week before the municipal elections in Reykjavik, and became a major success. All parties received their own space on the website to crowdsource ideas for their campaigns but just the Best Party used it extensively in their campaign. After they won 6 of the 15 seats of Reykjavik City Council and Jón Gnarr became mayor of the capital of Iceland, he called on Reykjavik citizens to use the Better Reykjavík online platform also during the coalition talks that happened after the election.

In a month time (before and after the elections), 40% of Reykjavik's voters used the platform and almost 2 000 priorities were created. This success led to an open collaboration between Reykjavik City Council and the Citizens Foundation. Better Reykjavík is still going strong after more than 4 years, with over **50.000 unique visitors** the past 12 months. The Citizens Foundation is working on a redesign of Better Reykjavík in cooperation with the city council that will be launched Q2 2015. More information on future developments of Better Reykjavík, and the integration within the D-CENT platform are documented in D4.3.

The screenshot shows the Better Reykjavik website interface. At the top is a navigation bar with links: Home, Ideas, Categories, People, a 'SUBMIT YOUR IDEA' button, a search bar, and Account/About dropdowns. Below the navigation bar is a banner image of a Reykjavik street scene. The main content area is divided into three columns. The left column shows an 'Overview' section with a post titled 'Events, markets and music Ingólfstorg weekends' by a user named 'Successful'. The middle column shows a 'Vote' section for the post, with 'UP 195' and 'DOWN 5' buttons, and a 'Share' section with 'Tweet' and 'Like' buttons. The right column shows a user profile for 'Gunnar Grímsson' with 49 karma, a bio, and a list of 'Your Priorities' including 'Banna lausagöngu cats', 'Airport away from Vatnsmýri', 'Transposition pokers in Iceland', 'Baldursgata made to einstefnugötu (this is the part)', 'District lists the work required to work in the neighborhood', and 'Edit Kaplaskjólsvegur north Haðamels City'. At the bottom of the left column, there are two sections: 'The possibilities are countless!' and 'Do this themselves', both with text describing the platform's goals and user participation.

Fig.13: Better Reykjavik screenshot of test

## 4.2 Better Neighborhoods

Ongoing with a budget vote scheduled for February 2. - 7. 2015

People who have participated	Tens of thousands
Number of ideas submitted by registered users	More than 1000
Budget allocated for citizens ideas	300 million ISK (1.9 million EUR) for 10 different neighbourhoods in Reykjavik
Number of ideas accepted since 2012	313 in total <ul style="list-style-type: none"> <li>• Year 2012 – 124</li> <li>• Year 2013 – 111</li> <li>• Year 2014 – 78</li> </ul>
Neighbourhoods involved	All in Reykjavik

Table 5.

**Betri hverfi** Choose another borough | Help | Rules | Logout |

1 AUTHENTICATE 2 SELECT BOROUGH 3 CHOOSE PROJECTS 4 VOTE RECEIVED

**Árbær**

19,5 used, 8,0 left You do not have to use the whole sum Select projects by clicking a name below

Project name	Amount in millions	Project name	Amount in millions
A Light footpath from Bæjarháls to Árbæjarstífla dam	8,5	I Picnic tables and benches near ball field by Bugða, Norðlingaholt	2,0
B Install roundabout at Bæjarbraut/Hraunbær	15,0	J Improve Árbæjartorg square, with picnic tables, benches and more	3,0
C Install lighting for ice skaters, by the sand beach at lake Rauðavatn	3,0	K Install more benches and litter bins along footpaths in Árbær	3,0
D Pave the bridge over Elliðaár river - close to Fylkir Stadium	1,0	L Repair basketball fields south of Hraunbær 62-70, by Rofabær	6,0
E Fitness equipment in area by Bugða - near Kólguvað, Norðlingaholt	5,0	M Install footpath at Hraunbær/Rofabær/Fagribær intersection	3,0
F Light footpath from Bröndukvísl to Fiskakvísl	5,0	N Renew a playground between Álakvísl and Silakvísl	12,0
G Improve footpath and limit speed in Bugða, at Kólguvað	3,0	O Install off-leash dog park - location yet to be decided	5,0
H Repair sledding slope in Selás	2,0	P Lay gravel footpath from Búðavað to Björnslundur, Norðlingaholt	3,0

**Vote**

You have not voted yet | [betrireykjavik@ibuar.is](mailto:betrireykjavik@ibuar.is) | [About the vote](#) | [About Better Reykjavik](#) | [About Better Neighborhoods](#) | [City of Reykjavik](#)

Fig.14: Better Neighborhoods screenshot of test

## 4.3 Your Priorities 3D

- Brings people together in real time virtual environments
- 3D universes of ideas that cluster together in content and context sensitive patterns
- Groups share environments to create multimedia presentations for ideas

Launch date	November 1 <sup>st</sup> 2014
Number of workshops so far	One pr. neighbourhood
Neighbourhoods involved	All neighbourhoods of Reykjavik
Participants	Over 300 citizens, with the Mayor of Reykjavik and another member of the capital's City Council.
Features	IRC for chat, for maximum access (some people just want to chat with no 3D worlds)  Live video from the real life meeting was streamed into the virtual world

Table 6.

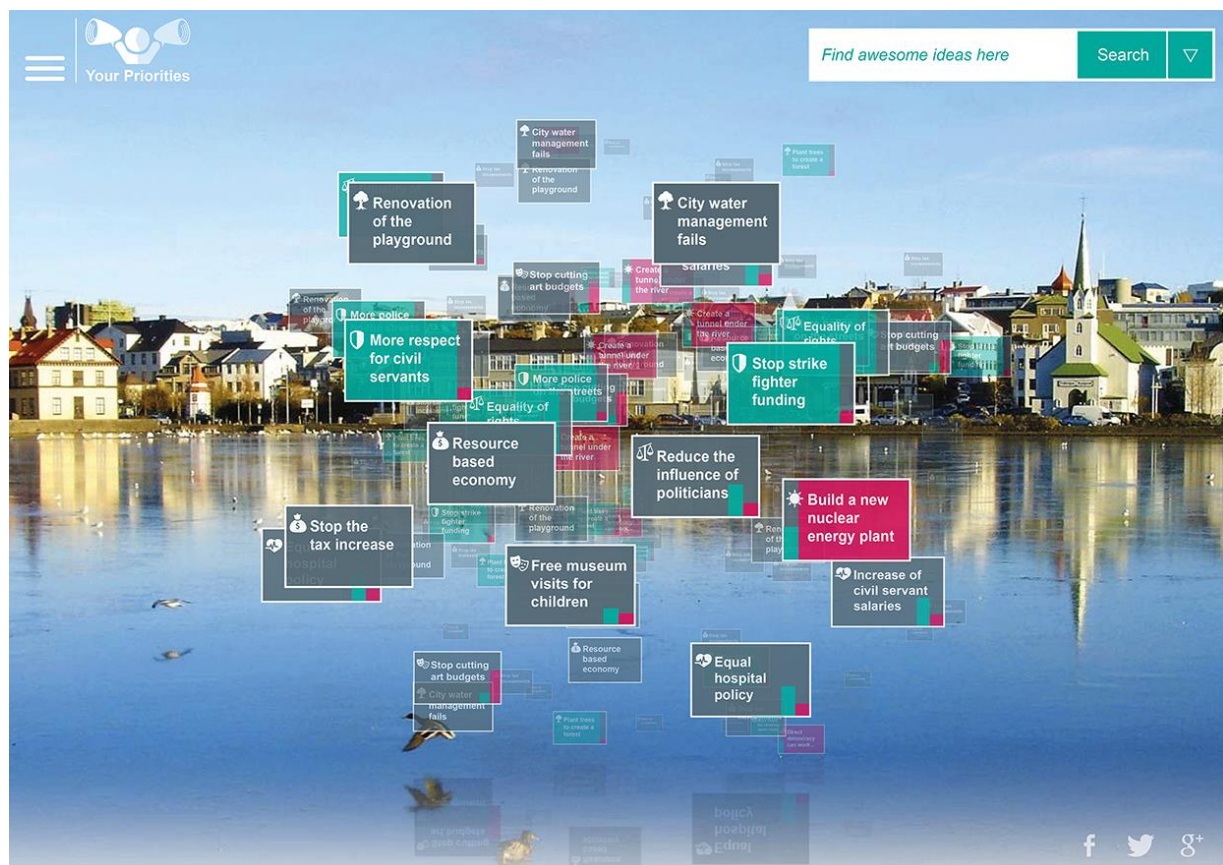


Fig. 15: Virtual Reality workshop

## 4.4 Peoples Assembly in Estonia

Duration	14 weeks
Number of participants	Over 3000
Proposals in the first 3 weeks of January 2013	Over 2000
Parliamentary participation	Top 15 ideas were presented in the Estonian parliament
Outcomes	As of November 2014, 7 of the ideas have been adopted as Estonian laws, 3 unchanged and 4 modified or combined with other laws.

Table 7.

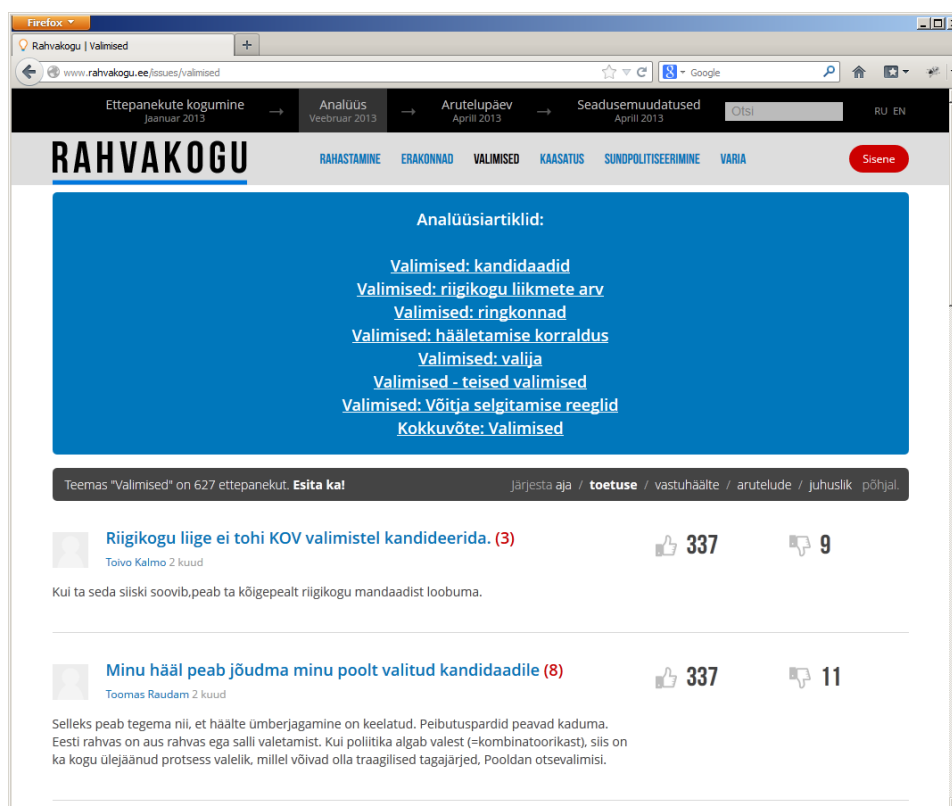


Fig.16: Peoples Assembly screenshot of test



After political scandals in Estonia in 2012, president Toomas Hendrik Ilves asked grassroots organisations to come up with ideas to improve the democratic framework in the country. They decided to crowd-source this reflection process using Your Priorities system.

The project uses Your Priorities for its online platform People's Assembly (Rahvakogu) was launched for crowd-sourcing ideas and proposals to amend Estonia's electoral laws, political party law, and other issues related to the future of democracy in Estonia.

President Toomas Hendrik Ilves delivered an interesting speech in which he underlined the current challenges at stake when it comes to articulating representative and participatory democracy. He said: "An efficient representative democracy works when the people's discontent and proposals are taken into account in-between elections and when the citizen truly sees members of parliament as their representatives, not as members of a political party who belong either to the governing coalition or the opposition."

"The people are made up of individuals. Our people, the same people upon whose shoulders Estonia rests, are clever and diverse. Only in a joint debate is it possible to establish which opinions are held in common and where differences remain. No one alone thinks or feels for everyone. [...] Estonian society demands an open debate; it wants to be a real and substantial participator in this process."

## 4.5 NHS Citizen, England

The National Health Service (NHS) in the United Kingdom is using Your Priorities to engage with citizens and to help people identify and discuss the issues that the NHS should be talking about.

Ideas that generate the most discussion and support or which have the biggest national significance will be brought to the Assembly meeting for further discussion with the NHS Board.

In the NHS Citizen Project we are experimenting with artificial intelligence to show news stories connected to submitted ideas.

NHS Citizen has 3 elements:

- The Discovery space – information and opinions are gathered through social media, public comment, online and offline tools.
- The Gather space – people can raise topics and discuss issues that they feel are important.
- The Assembly Meeting – happening twice a year and considering the most important issues in an open and deliberative format, and hold the Board to account

These might be issues concerning experiences of patients, users or carers, or those that highlight more general challenges.



Fig. 17: NHS Citizen, screenshot of test

A larger test is planned for next March 2015. Here is a link to the first assembly report meeting for further information:

<http://www.nhscitizen.org.uk/wp-content/uploads/2014/10/NHS-Citizen-Assembly-2014-Test-Report.pdf>

## 5. D-CENT User interface (UI)

### 5.1 Refactoring for future D-CENT deployments

Based on the analysis done in D4.3, we could recognize key user interface elements that need to be implemented during software development. To mitigate the risk of possible design flaws, an html mockup is built to <http://d-cent.github.io/patterns/.../03-templates-page.html>

We are using an object oriented systems design approach, adopting *Patternlab*, a collection of tools for creating design systems. First a minimum amount of UI components ('atoms'), such as buttons, form fields and other CSS components are added, after which objects are composed to larger entities ('molecules' and 'organisms'), and - finally - as pages and templates. This model enables us to change one object at a time, preview any changes in the user experience, see the impact of planned changes in the entire system, and have the piloting organisations' feedback, before committing software development resources to make the more work-intensive changes to the backend.

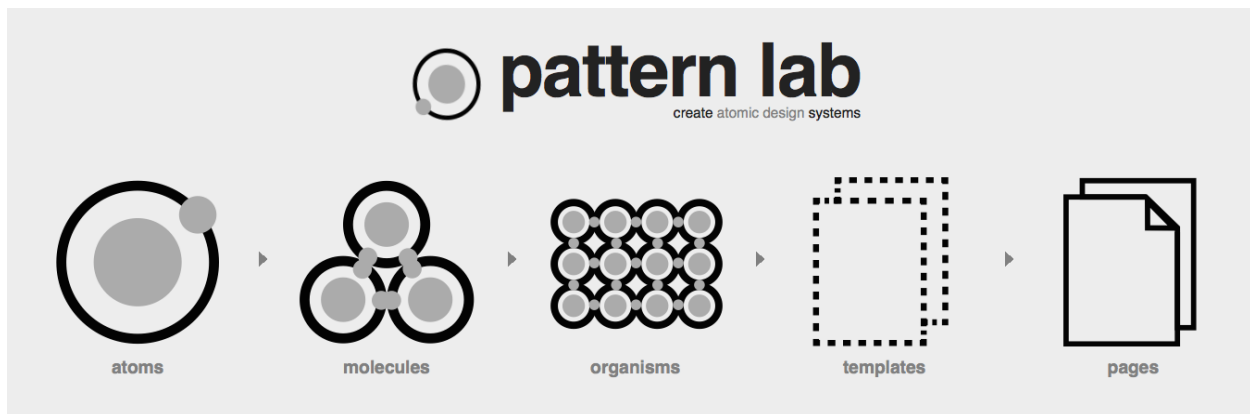


Figure 18: The Patternlab UI design structure

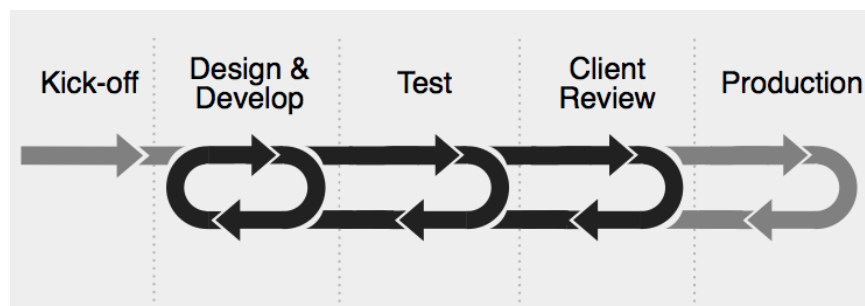


Figure 19: UI design and development process

The initial array of user interface objects is available here: <http://d-cent.github.io/patterns>. A richer list of components is being introduced to support further development and work as an interface between backend developers and pilot feedback. To ensure the design scenarios work, html mockups are created of all the pages defined in D4.3, so pilot feedback contribution can be pinpointed to right components in further development.

Main design hypotheses that need to be solved are:

#### *Navigation menu and tool-bar*

- Should voting be available at all times when users are reading a proposal? Does this increase voting participation? Does this decrease reading or discussion? *(Metrics: how long time spent on the page before and after voting button has been hit. Questionnaire: how much of the text did you read before you voted? was it helpful or not to have the voting function available?)*
- Should commenting/discussion be available at all times while reading the text? Does this increase discussion activity? *(Metrics: how long time spent on the page before commenting, frequency of commenting and responses. Questionnaire: how much of the text did you read before you started the discussion? was it helpful or not to have the commenting function available at all times?)*
- One feedback comment: “discussion should be more agile, like a chat”. Discussion as constantly available chat (see FB) but with topic tags? *(Metrics: increase in discussion when in “chat” format? More participation overall? Increase in “dependents” like voting?)*

#### *Discussion and commenting*

- Make validation function (voting up or down) for comments more visible?
- Is a “Like” button more intuitive than arrows for this? *(Metrics: Check for increase in use with Like button).*
- Ability to retract validation and abstain? *(Metrics: How many clicks)*
- Filtering tabs for discussion to include “for” and “against” – determined by voting preference *(Metrics: How many clicks)*
- Need for being able to start a discussion independently of a document being put forward for deliberation? (i.e. making discussions independent from admins, and as a process that might start with discussion, before potentially moving to document draft and voting at the more mature stages). *(Metrics: How many discussions started? Participation more active than when process starts with document? How many discussions then feed into document draft and voting?)*

#### *Feed filtering*

Filtering options as tabs, buttons or icons?

How much do the tabs get used? And is there a need for other types of filtering:

- Hot now *(metrics, how many hits in a given amount of time)*
- Closing soon *(as above)*

- Recently added (*as above*)
- My activities (*as above*)
- Other? (*Questionnaire: Are there other types of filtering needed for the feed?*)

#### *Need for search*

- Does the platform need a search function? (*Analyse whether it is flagged as a need in the questionnaires*)

#### *Need for permalink sharing*

- Automatically to social media platforms
- As a copy-able URL

#### *Notifications*

- When a user gets a response to their comment or upload – email or sms ping? Notification in activity stream?
- Notification for voting that is closing soon – email or sms ping? “Warning” colour in activity stream? Notification in navigation bar?

These hypotheses and questions have been developed in response to feedback from the Guanyem and Podemos pilots in Spain and will be further expanded following the pilots in Finland in December. The hypotheses will then form the basis for further testing and feedback as and when design changes and features are iterated over the next months within WP5 (T5.3). Where some of these hypotheses can be tested and analysed by setting up metrics to gather data on user behaviour, others require qualitative feedback from users about their experience. We are relying on the pilot groups to gather feedback on the overall UI experience using the above questions as an initial guideline to create questionnaires, and as a framework to set up appropriate metrics. (See appendix 2 for our current questionnaire, which is updated for each iteration and pilot).

## 5.2 User interface redesign for the DOS/D-CENT deployments

A branch of D-CENT CSS was refactored for DemocracyOS, to give the prototype a recognisable look and feel, making it clear to users that they are using D-CENT. The implementation was merged here: <https://github.com/d-cent/democracyos/pull/56>. A specific list of changes here: <https://github.com/d-cent/patterns/issues?...Guanyem-10-11>

The end result is a version of DemocracyOS with D-CENT CSS: <http://democracyos-dcent.herokuapp.com/> and <http://finnish-democracyos.herokuapp.com>.



Fig. 20: DemocracyOS implementation of D-CENT CSS

## 5.3 D-CENT Styleguide

<http://d-cent.github.io/patterns/public>

The D-CENT style-guide has been developed in order to specify common styles and layout to be used for D-CENT pilots where there is no group specific styles specified. The style-guide specifies use of colours, fonts, icons and image styles, and outlines the use of D-CENT “brand” elements such as the Aldo font, and the project logo. The style-guide exists both as pdf (see pages 43 - 44) and as CSS / moustache styles in the D-CENT Patternlab (<http://d-cent.github.io/patterns/public>) (see pages 45 - 47). Patternlab thus functions as a central data-base for UI and styles for pilots and the D-CENT project overall. Having one central data-base for styles allows for a streamlined iteration, where changes can be easily viewed and adopted by project partners from the level of atoms all the way to full pages and templates.

# Colors and Fonts

Styleguide 01

Use minimum magenta. Keep color ratio at 80-20 or better, 90-10.

Header is always darker than subheader.

When colour-ratio for any reason is closer to 50/50, (eg. voting pie chart) use a lighter version of one, and a darker of the other.

Blacks and gray-scales can be used in any combination with the other colors.

For grays, the ratio can vary from 50-50 to 80-20 (gray-color).

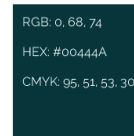
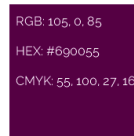
## Titles

and body text

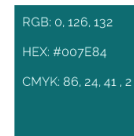
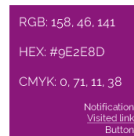
Icon focus



Nav bar



## Subheaders



## Titles

and body text for feeds in general mode

Main D-CENT color

## Subheaders

Links

Icon focus

Time stamp

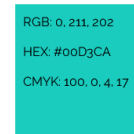
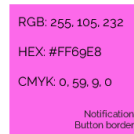
and other metadata

Button borders

Icons



Toolbar



BACKGROUND COLOR

RGB: 238, 238, 238  
HEX: #EEEEEE  
CMYK: 5, 4, 4, 0

BUTTON BACKGROUND COLOR

RGB: 255, 234, 252  
HEX: #FFFAFC  
CMYK: 0, 8, 1, 0

BUTTON BACKGROUND COLOR

RGB: 211, 255, 253  
HEX: #D3FFFD  
CMYK: 17, 0, 1, 0

Comfortaa: Title font

Muli: Body font

Aldo: Brand font

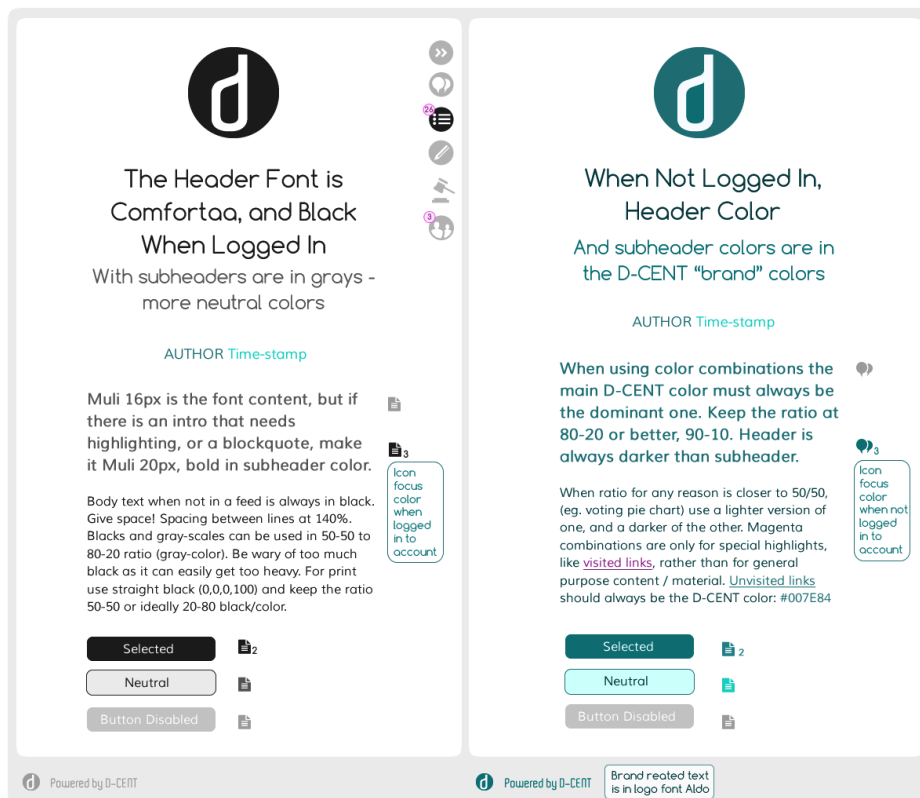


Fig. 21: Page from styleguide pdf



## Graphic and 'brand' elements

Styleguide 02

The current logo will have an update, alongside the design of a new set of icons for specific categories. This will be implemented end of the month (November 2014).



The spelling of  
D-CENT is always  
In all caps and with the  
hyphen

The only **exceptions** are in the logo and URLs. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh D-CENT euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation.

<http://d-cent.exception-for-ALLCAPS-spelling-for-urls-only>



The logo font Aldo should mainly be used for content that is specifically 'brand' oriented. For example, the keywords from the top of the website, that currently has a paragraph with some info, which should remain in a readable font, like Muli: D-CENT is a Europe-wide project creating privacy-aware tools and applications for direct democracy and economic empowerment. Together with the citizens and developers, we are creating a decentralised social networking platform for large-scale collaboration and decision-making. Followed by the:

Keywords of the D-CENT project

Community ownership of social data

Security and privacy by design

Open standards Mass scalability

Access to knowledge Open source

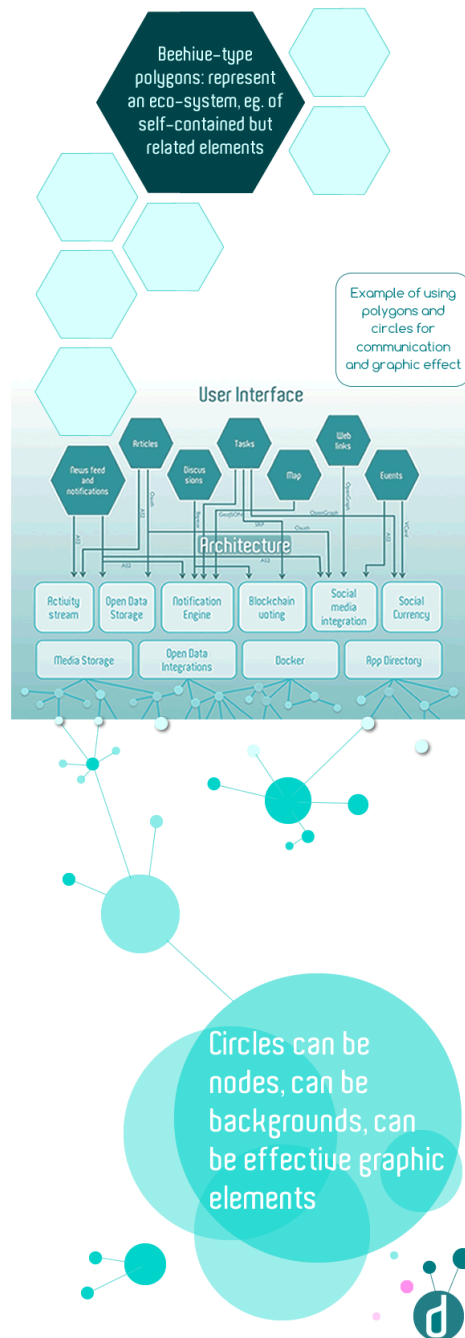


Fig. 22: Page from styleguide pdf

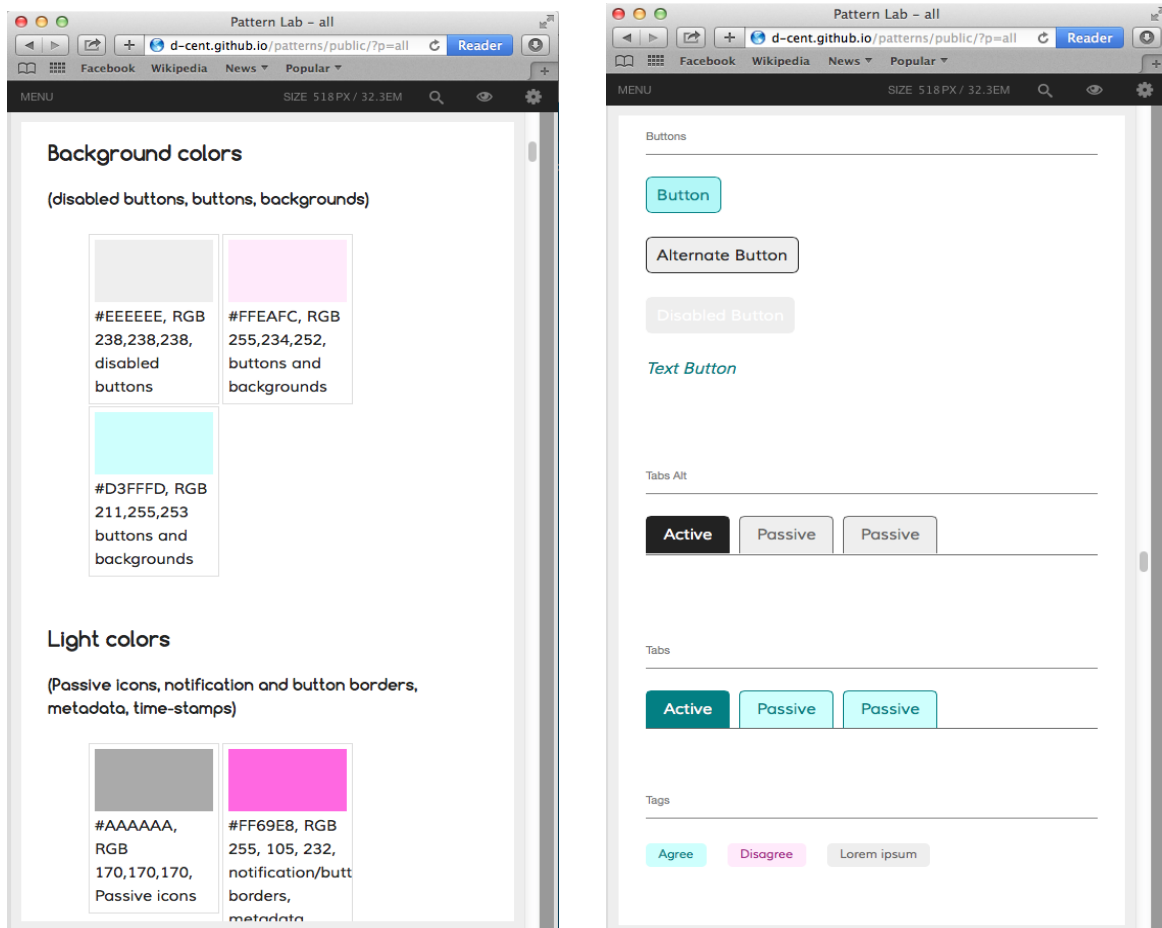


Fig. 23: Screenshots from D-CENT patternlab styleguide 'atoms'

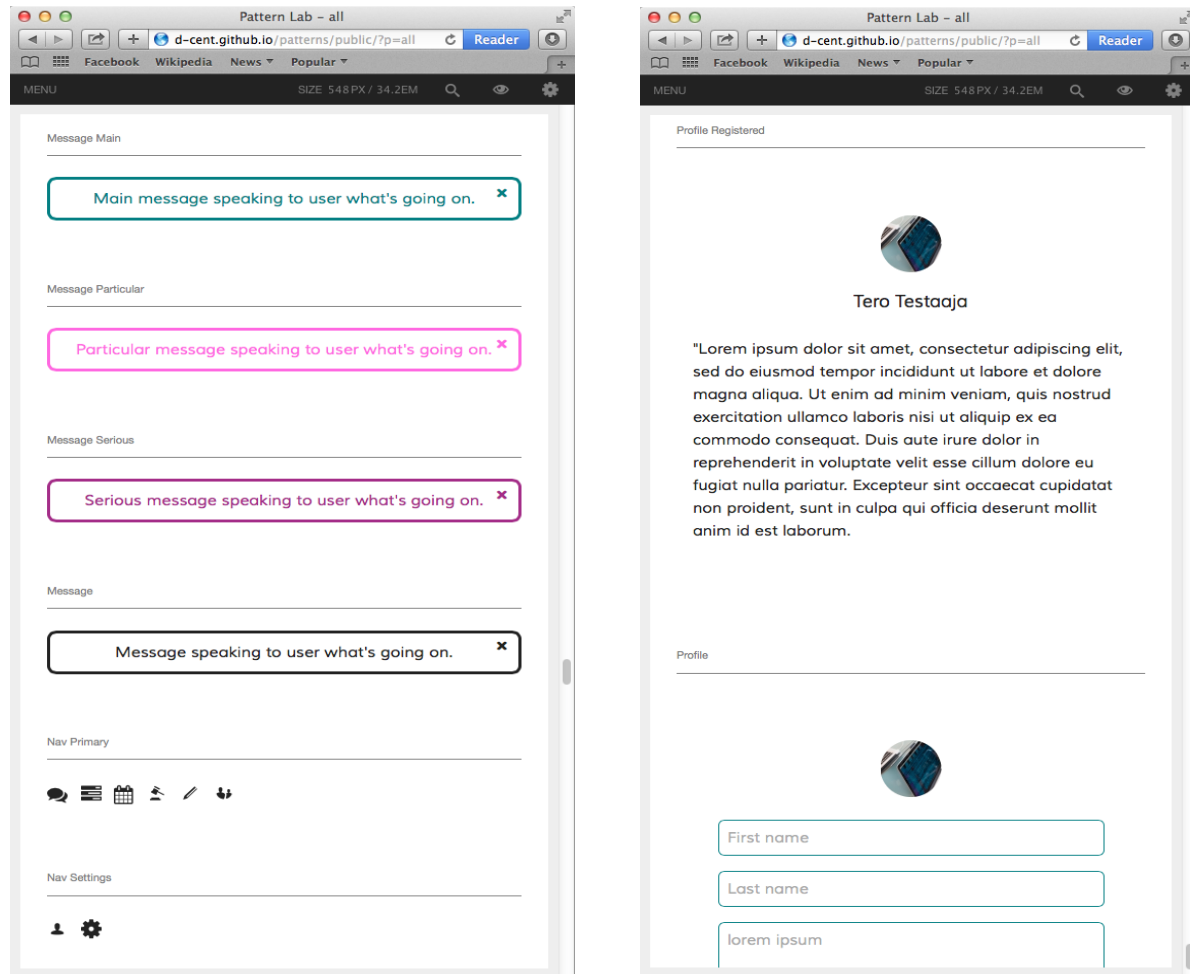
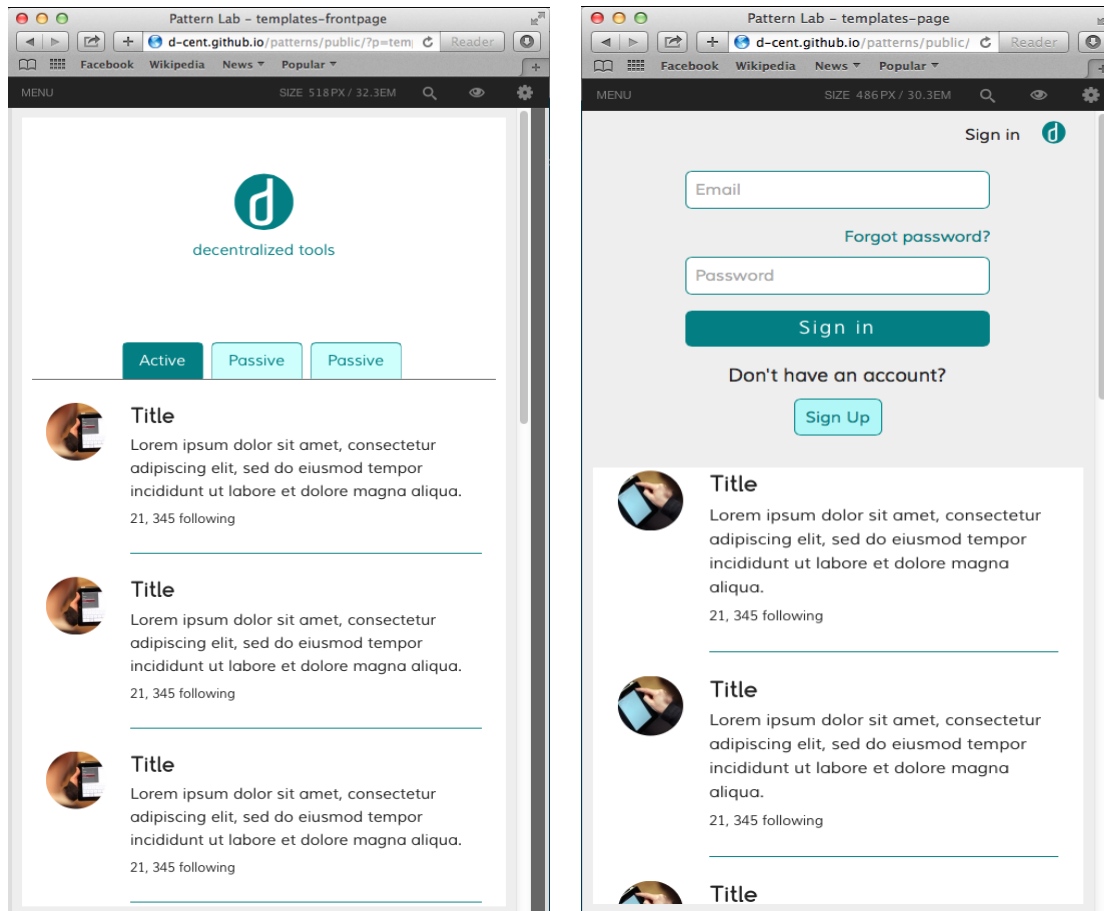


Fig.24: Screenshots from D-CENT patternlab styleguide 'molecules and 'organisms',  
messages and suggested layout for profile pages and forms



*Fig. 25: Screenshots from D-CENT patternlab styleguide 'pages', suggested layout for responsive mobile view for activity stream and log-in slide-down*

## 6. Description of new Features tested in the DemocracyOS-based pilots

The Democracy OS codebase has been upgraded with the following features and functionalities that are documented in Github: <https://github.com/d-cent/democracyos/issues> and can be tested here: <http://democracyos-dcent.herokuapp.com/>

The features here described were tested in the use cases described above in Spain (Guanyem and Podemos) and Helsinki. Here we summarise the features developed, and the user stories associated to the testing. We also point to the relevant code on Github, and provide a screenshot of the testing done.

## 6.1 Annotation

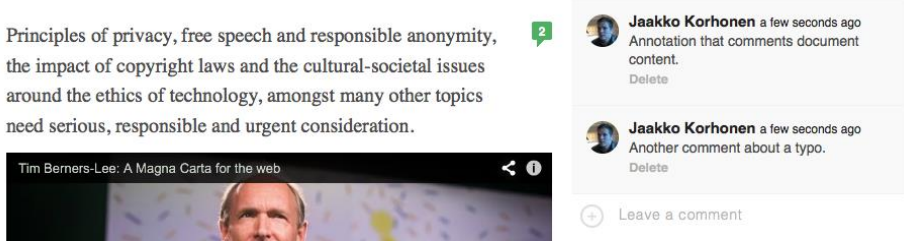
Feature	Side comments to Articles
Feature Definition	Annotations are implemented as ActivityStreams item linked to articles, but refer to only a subset of the text in an article and are so displayed “inline,” generally to the right of an article.
User story	As the reviewer of a document, I need to add context-specific comments that the document owner can approve or dismiss. Users comment positive and negative comments that be voted up or down.
Description	Annotations are needed article editors might want to allow third parties to annotate their text and possibly suggest changes that are connected to particular parts of text. This would be useful if, for example, in a proposed law (which is often a very large piece of text) there would be needed the ability to comment only on a single sentence. This is illustrated in Figure XX Admins are able to delete any comment or side-comment.
Technical implementation	It is a re-usable component and integrated it into DemocracyOS. Main side-comments repository: <a href="https://github.com/DemocracyOS/side-comments">https://github.com/DemocracyOS/side-comments</a> All the work we did for this can be seen here: <a href="https://github.com/DemocracyOS/side-comments/commits/master">https://github.com/DemocracyOS/side-comments/commits/master</a>
Screenshot of Testing done	 <p>The screenshot shows a DemocracyOS article titled "Principles of privacy, free speech and responsible anonymity, the impact of copyright laws and the cultural-societal issues around the ethics of technology, amongst many other topics need serious, responsible and urgent consideration." Below the article text is a video player showing a portrait of Tim Berners-Lee with the caption "Tim Berners-Lee: A Magna Carta for the web". To the right of the article, there are two side comments by Jaakko Korhonen. The first comment says "Annotation that comments document content." and the second says "Another comment about a typo." Both comments have a "Delete" button. At the bottom of the comments section is a "Leave a comment" button.</p>

Table 8.

## 6.2 Filtering bills tagged by topic


Feature	Tags
Feature Definition	A drop-down to filter. It allows users to select tags (by topic) that they will get notifications from. Users are required to suggest tags as the user started typing the input . Topics are bound to tags. Tags can be re-edited and re-used. The tag filtering works by providing user a way to filter out topics from a given tag. The number of tags you see depends on the tags topics are associated to. Tags that don't have topics associated to them are never displayed in the filter in the sidebar.
User story	The admin upload to the platform the policy proposal, coming from 13 different thematic Committee so that users can debate and vote on the different proposals. Each Commission will have a specific tag and icon associated to that tag. In this way users will be able to subscribe to tags and debate texts filtered by topic associated to that tags. The programme will be then commented and voted by all citizens.
Description	Tags allow users to better filter and organise information. They are useful to filter what we want to read and avoid information overload.
Technical implementation	<p>It is a re-usable component and integrated it into DemocracyOS.</p> <p>Main side-comments repository: <a href="https://github.com/DemocracyOS/side-comments">https://github.com/DemocracyOS/side-comments</a></p> <p>All the work we did for this can be seen here: <a href="https://github.com/DemocracyOS/side-comments/commits/master">https://github.com/DemocracyOS/side-comments/commits/master</a></p> <p>It was addressed on <a href="https://github.com/d-cent/democracyos/issues/34">https://github.com/d-cent/democracyos/issues/34</a> and can be tested on the D-CENT DemocracyOS prototype.</p>
Screenshot of Testing done	 <p>The screenshot shows a sidebar with the following elements:</p> <ul style="list-style-type: none"> <li>4 OPEN (highlighted)   1 CLOSED</li> <li>CLOSING SOON (dropdown arrow)</li> <li>CULTURA (dropdown arrow)</li> <li><input type="checkbox"/> HIDE VOTED BY ME</li> </ul> <p>The main content area displays two bills:</p> <ul style="list-style-type: none"> <li><b>Declarar Ciudadana Ilustre a la Sra. Iris Scaccheri</b> (with a checkmark icon) - 3 Participants</li> <li><b>Declarar Ciudadano Ilustre al actor, director y maestro escénico, Osvaldo Bonet</b> - 2 Participants</li> </ul>

Table 9.



## 6.3 Admin/main user and group pages

Feature	Admin/User pages
Feature Definition	Admin page for loading bills, projects or discussion topics. The user page allows users to select their tags from newstream link their profile to an image and add a description.
User story	As a user, I will submit documents for members and the public to comment vote and edit commission and internal documents. Admin adds a new document and submits it for Discussion, and sets a deadline date for the Discussion. Documents are based on different topics to be discussed, and associate each topic with a filter.
Description	Admin page is the place where admins can create projects, edit content, link pictures and videos, create tags. User pages are the user's page where users can edit their personal information, select their tags and select their picture.
Technical implementation	<p>Admin is available in <a href="http://democracyos-dcent.herokuapp.com/admin">http://democracyos-dcent.herokuapp.com/admin</a> (you need to be admin and logged in to see it). The user page is available in <a href="http://democracyos-dcent.herokuapp.com/citizen/me">http://democracyos-dcent.herokuapp.com/citizen/me</a> and by clicking on the 'edit' icon. No direct-URL for this. Work and discussions are documented here:</p> <p><a href="https://github.com/d-cent/democracyos/issues/11">https://github.com/d-cent/democracyos/issues/11</a></p> <p><a href="https://github.com/d-cent/democracyos/issues/35">https://github.com/d-cent/democracyos/issues/35</a></p> <p><a href="https://github.com/d-cent/democracyos/issues/39">https://github.com/d-cent/democracyos/issues/39</a></p> <p><a href="https://github.com/d-cent/democracyos/issues/44">https://github.com/d-cent/democracyos/issues/44</a></p> <p><a href="https://github.com/dcent/democracyos/issues/45">https://github.com/dcent/democracyos/issues/45</a></p>
Screenshot of Testing done	

Table 10.

## 6.4 Voting


Feature	Functionality for communal democratic decision-making
Feature Definition	User is shown options to Agree/Disapprove/Abstain to express their opinion about the proposal in the Article
User story	Users need a tool to submit documents for members and the public to comment vote and edit commission and internal documents. A user, who added the proposal, decides to put it to vote, and clicks on the button to activate voting functionality. User sets a deadline date for the Vote. Users vote proactively on the items that are in a activity stream for New votes on proposal items. All party members receive a flag in their d-cent notifications button.
Description	Voting allows users to mark their preferences on bills, projects and laws - they can vote YES, NO or ABSTAIN.
Technical implementation	This is available in the official demo deployment and also Articles can optionally be set non votable by the admin; as requested by Guanyem pilot organisers. The option can be seen as a document owner when creating a new Article: <a href="http://democracyos-dcent.herokuapp.com/admin/laws/create">http://democracyos-dcent.herokuapp.com/admin/laws/create</a> : A non-votable law can be seen in the Guanyem Pilot: <a href="http://codietic.herokuapp.com/law/5435b9d227227a0e00dfd8b7">http://codietic.herokuapp.com/law/5435b9d227227a0e00dfd8b7</a>
Screenshot of Testing done	 <p>VOTE</p> <p>3 votes cast</p>

Table 11.

## 6.5 Notification engine with user preferences

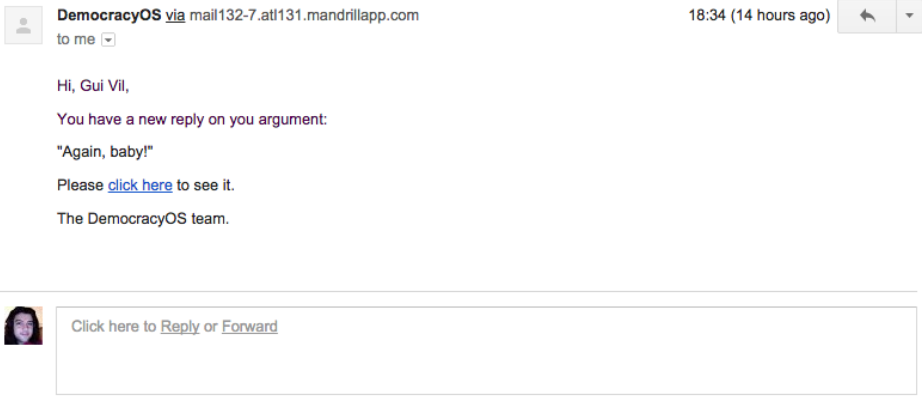
Feature	A rule engine based on users' personal preferences notifies them of new data in the system.
Feature Definition	Notifications are generated by the notification engine and stored in the core of the D-CENT platform. It informs users when a bill is being closed, when their argument is replied to upvoted or downvoted and when they are mentioned.
User story	A user needs to know when an event happens relevant to their community's data. For example, when an edit is made to a document they are working on or when the community makes a decision about a proposal.
Description	<p>When taking part in a debate on the platform it's extremely important that it let's users know when other users are interacting with them. In previous experiences we found out that unless you get a notification it's unlikely you'll go back to the debate to see if someone has replied to your comment. The engine sends you an email every time a user gets mentioned or an argument replied to, upvoted or downvoted. There are going to be settings at the user level and proposal level. Notifications will be sent for every update or a report every certain period of time. A notification engine consists of the following components:</p> <ul style="list-style-type: none"> <li>- Server: events taking place in the debate online are stored for later processing.</li> <li>- Triggers: Functions that are executed whenever a specific event is received by the Server. They are mentions, replies, upvotes and downvotes, bill closing dates and tag-related activity.</li> </ul>
Technical implementation	The notification engine is under the notifier branch: <a href="https://github.com/d-cent/democracyos/tree/notifier-integration">https://github.com/d-cent/democracyos/tree/notifier-integration</a> and sends out email as a transport protocol. It should support Twitter. If necessary, we can expand the notification engine to post to Facebook, although due to restrictions by Facebook it will require a "Facebook App" for D-CENT to be built. Notification options can be seen under /settings/notifications
Screenshot of Testing done	

Table 12.

## 6.5.1 Testing the notification engine with the open decision-making API data of the City of Helsinki

The notification engine uses a data router that consumes external API data in ActivityStreams 2.0 format, and publishes it as D-CENT articles.

### Test and implementation:

A place to display data obtained from an ActivityStream2.0-compliant API was added to the user profile ([democracyos-dcent.herokuapp.com/citizen/me](https://democracyos-dcent.herokuapp.com/citizen/me)) as documented here (<https://github.com/d-cent/democracyos/issues/11>), and is now ready to be linked to the City of Helsinki decision-making open API. **OpenAhjo** is an API used by the City of Helsinki that provides a common format (both XML and JSON-based) for decision-making data. This will be integrated tightly into the notification engine for the Helsinki pilot. See D4.3 for a description of the Open Ahjo API and the detailed user stories.

The first tests will happen during the second and third week of December, as part of the Finnish pilot scribed in section 3.3 “Helsinki City - Grassroots Action to Helsinki City Decisions”. This MVP will test the Helsinki City Decisions Newsfeed, a tool designed to help Helsinki residents to find out what decision are being made in the City Board, City Council and all the subcommittees. The citizens of Helsinki, and in particular the neighbourhood association Helka, will use the tool to spread information about the municipal council agenda, so as to make it more understandable to all members, get notifications about relevant issues, and eventually be able to take better-informed collective action.

## 7. Roadmap for Distributed Social Networking Implementation

The W3C has begun the Social Web Working Group (<http://www.w3.org/Social/WG>) and Interest Group (<http://www.w3.org/Social/IG>) at the end of August 2014. More detailed information can be found in D4.3. It has since had weekly meetings with 20+ attendees, co-ordinated by Harry Halpin (W3C) of D-CENT, to produce the specifications needed for a decentralised social web. Although not currently used in the prototype experiments, two specifications were produced. Currently Jaakko Korhonen of D-CENT is an Invited Expert, and Harry Halpin (W3C) is Team Contact for the Working Group and Interest Group. The Social Interest Group meets bi-weekly with over 12+ people to define high-level messaging, use-cases, and vocabularies for the Working Group. Harry Halpin (W3C) also co-ordinates those meetings and serves as a link between the Interest Group and D-CENT.

In particular, the Working Group has produced two standards on October 23rd 2014 October 3rd, attached below. The first is a syntax for ActivityStreams 2.0, which defines the JSON-based format with URI-based extensibility for decentralised social networking. The second format is ActivityStreams Vocabulary, which defines commonly-used terms in decentralised social networking for use with the ActivityStreams 2.0 syntax. The specifications are attached below to give details on the Working Group's work in the first review period. For more information about Activity Streams and its use within the D-CENT pilots, please see the D4.3 under the D-CENT Core Features, and its applications in the Helsinki pilot.

The Social Web Working Group also had their first face-to-face meeting at TPAC (W3C Technical Plenary) in Santa Clara, California in October. This two day meeting was the first time the Working Group had met face-to-face, and the roadmap for future work was solidified. A picture of the Working Group is below and minutes are available on the Social Web Working Group homepage.



*Fig. 26: W3C Social Web Working Group Face-to-Face Meeting*

The Social Web Working Group also hosted a joint meeting with Google over the future of Schema.org, the base of Google’s Knowledge Graph that was attended by R.V. Guha, Dan Brickley, and Sam Goto of Google. Google at this meeting agreed to find a way to make Schema.org work with royalty-free standards via “snapshots” of schema.org. If Google can clarify their intellectual property and normative standing of schema.org with W3C so that it is compatible with open source, we expect D-CENT could use it. Tim Berners-Lee of the W3C also attended the meeting to support opening up Google’s schema.org.



*Fig. 27: W3C Social Web Working Group meeting with Google*

The Social Web Working Group plans (see D4.3 for precise scheduling) to release a first public working draft API and federation protocol by between the end of 2014 (Dec) and the first quarter 2015 (March). We expect experimentation to begin until the end of third quarter 2015 (end of August), after which a public call for review and implementation (Last Call) will begin, with testing interoperability given in between August 2015 and July 2016.

Thus, we expect ThoughtWorks to begin implementing open-source libraries for decentralised networking beginning after March 2015, with interoperability testing between D-CENT and other decentralised social networking platforms in the Working Group happening between August 2015 and the end of the project. The W3C has been co-ordinating with ThoughtWorks since their joining of the project to help the standards reach their full potential.



# Appendix 1

## Questionnaire for pilot feedback

### Introduction to questionnaire:

*Thank you for testing D-CENT tools. We are grateful that you take the time to give us feedback on your experience using this tool, so that we can keep improving and expanding it based on your needs. Please fill out this form and return it to: [insert pilot group contact person]*

*D-CENT is a Europe-wide project for creating tools for direct democracy and economic empowerment. More information about the D-CENT project can be found here: <http://d-centproject.eu/>. If you have further questions, comments, suggestions or feedback, please do not hesitate to contact us: [info@d-centproject.eu](mailto:info@d-centproject.eu)*

### General

How was your experience of using this tool?

### Access

How easy was it to access from your computer/ tablet/ mobile phone?

### Interface

- What do you think of the look and feel of the tool?

#### *Navigation menu and tool-bar*

- How easy was it to navigate?
- Could you find what you needed?

#### *Voting*

- Did you use the voting function?
- \*Was it helpful or not to have the voting function available while reading the text?
- \*How much of the text did you read before you voted?

#### *Commenting*

- Did you comment on any article?
- Was it easy to participate in discussions?

- \*How much of the text did you read before you commented/joined a discussion?
- \*Was it helpful or not to have the commenting function available at all times?

#### *Feed filtering*

- How was it to navigate the left-hand content feed?
- Could you find the documents that you needed easily?
- Did you subscribe to any tags?
- How easy was it to subscribe to tags?

#### *Admin*

- Did you create a new topic?
- How easy was it to create and edit your topic?
- Did you create new tags?
- How easy was it to create, edit and assign tags?

### **Closing questions**

Would you use it again?

Would you recommend others to use it?

What were your main frustrations with using the tool?

What were the best aspects of the tool?

Any other comments?

# Appendix 2

Feedback questionnaire from Podemos Virtual Assembly using DemocracyOS

## Introduction to the questionnaire:

*For this virtual assembly we looked for tools and from D-CENT <http://d-centproject.eu/> they contacted us to offer this platform. They ask for your feedback, suggestions and general impression. Please reply in the argument section, which things you would change and which ones you would leave.*

## How is your experience with this tool?

*Replies: (we've categorised them)*

### General

- "It's OK" (3 times)
- "Innovative, intuitive" (3 times), "easy to use", "attractive".

### Access

- "I couldn't access it from a computer with an old system"
- "Using a firefox browser in Linux it makes activates the vent and one of the processors is at max. I imagine an old system would struggle"
- "using a chrome mobile browser in Android XPERIA, the left-side bar doesn't download, you can only see the first two proposals"

### Visualisation

- "It would be useful to have to separate arguments columns, one for and one against"
- "the left-side bar proposals could be grouped by categories that can be expanded and collapsed"
- (#proposal/bottom-up) "Allow for a space to re-direct, group and link proposals presented in the argument sections. In this way all users can access all formulated proposals in the same place and vote on them without having to go into all the topics one by one. One solution could be one discussion topic that is an index that expands, showing all proposed proposals"
- "Incorporate a space where we can access all public documents of all different groups without the need to enter each discussion topic. Solutions could be links to drop/box or google drive"

- “Its crazy to look at all my arguments one by one to see if there is a reply. I am not sure if replies to your arguments could appear on top. It would be useful for a constructive debate”

## Notifications

*Five users mentioned the need to get a notification when there is a reply to your argument or more replies to an argument you’ve replied to.*

- “It would be useful to have a notification system for when someone replies to a comment”
- “It would be interesting to receive an e-mail alert when someone replies to an argument or to the reply to an argument. We could have a more efficient and direct communication”

## Interaction

- “While evaluating comments it is not possible to retreat on your valuation. Once you ‘upvoted’ or ‘downvoted’ you can’t go back to ‘no valuation’ you can only change between (+1) or (-1)”
- “I was expecting a conversation more agile, like a chat”

## Identity Validation

- “What prevents anyone from creating many different accounts and vote as many times as they want? If you can’t verify identity somehow it seems easy to trump the votes”
- suggests a id validations system like twitter’s
- suggests an offline id validation.

## Bottom-up

“It looks like a slow mechanism for assemblies, because it doesn’t allow for immediate proposal formulation and you have to wait for the moderator to process them. This requires to maintain attention on this platforms during several days”

## Replies

- How to avoid trolling? Collective moderation?

# Appendix 3

## W3C Activity Streams 2.0 Specification

Activity Streams 2.0

<http://www.w3.org/TR/2014/WD-activitystreams-core-20141023/>

### Activity Streams 2.0

W3C First Public Working Draft 23 October 2014

**This version:**

<http://www.w3.org/TR/2014/WD-activitystreams-core-20141023/>

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### Abstract

This specification details a model for representing potential and completed activities using the JSON format.

### Author's Note

*This section is non-normative.*

This draft is heavily influenced by the JSON Activity Streams 1.0 specification originally co-authored by Martin Atkins, Will Norris, Chris Messina, Monica Wilkinson, Rob Dolin and James Snell. The author is very thankful for their significant contributions and gladly stands on their shoulders. Some portions of the original text of Activity Streams 1.0 are used in this document.

### Status of This Document

*This section describes the status of this document at the time of its publication. Other documents may supersede this document. A list of current W3C publications and the latest revision of this technical report can be found in the [W3C technical reports index](#) at <http://www.w3.org/TR/>.*

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## 1. Introduction

In the most basic sense, an "activity" is a semantic description of a potential or completed action. In the former case, the activity expresses what can or might be done with a particular object, while in the latter case, it expresses what has already been done.

It is the goal of this specification to provide a JSON-based syntax that is sufficient to express metadata about activities in a rich, human-friendly, machine-processable and extensible manner. This may include constructing natural-language descriptions



or visual representations about the activity, associating actionable information with various types of objects, communicating or recording activity logs, or delegation of potential actions to other applications.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

## 1.1 Relationship to JSON Activity Streams 1.0

*This section is non-normative.*

The JSON Activity Streams 1.0 [AS1] specification was published in May of 2011 and provided a baseline extensible syntax for the expression of completed activities. This specification builds upon that initial foundation by incorporating lessons learned through extensive implementation, community feedback and related ongoing work from a variety of other communities.

While the syntax defined by this specification diverges somewhat from that defined by JSON Activity Streams 1.0, the verbs, objectTypes, extensions and fundamental model defined by that original specification remain intact, and every valid Activity Streams 1.0 document is a valid Activity Streams 2.0 document.

Please refer to Section 6 for more detail about the differences between the 1.0 and 2.0 syntax and for a listing of specific backwards compatibility requirements.

This specification incorporates several existing extensions to the 1.0 syntax directly into the 2.0 model. These include portions of the Activity Streams 1.0 Base Schema, Audience Targeting, Responses, and Priority extensions.

## 1.2 Serialization Notes

This specification describes a JSON-based [RFC7159] serialization syntax for the [Activity Vocabulary](#) that follows the conventions defined by the [JSON-LD] specification. While serialization forms other than JSON-LD are possible, alternatives are not discussed by this document.

When serialized, absent properties are represented by either (a) setting the property value to null, or (b) by omitting the property declaration altogether at the option of the publisher; these representations are semantically equivalent. If a property has an array value, the absence of any items in that array **MUST** be represented by omitting the property entirely or by setting the value to null. The appropriate interpretation of an omitted or explicitly null value is that no value has been assigned as opposed to the view that the given value is empty or nil.

This specification uses IRIs [RFC3987]. Every URI [RFC3986] is also an IRI, so a URI may be used wherever an IRI is named. There are two special considerations: (1) when an IRI that is not also a URI is given for dereferencing, it **MUST** be mapped to a URI using the steps in Section 3.1 of [RFC3987] and (2) when an IRI is serving as an "id" value, it **MUST NOT** be so mapped.

Unless otherwise specified, all properties with date and time values **MUST** conform to the "date-time" production in [RFC3339], with an uppercase "T" character used to separate date and time, and an uppercase "Z" character in the absence of a numeric time zone offset. All such timestamps **SHOULD** be represented relative to Coordinated Universal Time (UTC).

Activity Streams 2.0 documents **MUST** be serialized using the UTF-8 character encoding.

## 2. Examples

*This section is non-normative.*

Following are three examples of activities with varying degrees of detail. Each of the examples uses an implied JSON-LD @context equal to that provided [here](#).

### 2.1 Minimal Activity

Fig. 1 Expresses the statement "'urn:example:person:martin' posted 'http://example.org/foo.jpg'". No additional detail is given.

#### EXAMPLE 1

```
{
  "@type": "http://activitystrea.ms/2.0/Activity",
  "verb": "post",
  "actor": "urn:example:person:martin",
  "object": "http://example.org/foo.jpg"
}
```

### 2.2 Basic activity with some additional detail

Fig. 2 Expresses the statement "Martin Smith posted an article to the blog 'Martin's Blog' at 3:04 PM GMT on February 2, 2011." Some additional details about the article, actor and target blog are given using properties defined by the [Activity Streams 2.0 Vocabulary](#).

#### EXAMPLE 2

```
{
  "@type": "http://activitystrea.ms/2.0/Activity",
  "language": "en",
  "verb": "post",
  "published": "2011-02-10T15:04:55Z",
  "actor": {
    "@type": "urn:example:types:person",
    "@id": "urn:example:person:martin",
    "displayName": "Martin Smith",
    "url": "http://example.org/martin",
    "image": {
      "@id": "http://example.org/martin/image.jpg",
      "@type": "http://activitystrea.ms/2.0/Link",
      "mediaType": "image/jpeg"
    }
  },
  "object": {
    "@type": "urn:example:types:article",
    "@id": "urn:example:blog:abc123/xyz",
    "url": "http://example.org/blog/2011/02/entry",
    "displayName": "Why I love Activity Streams"
  },
  "target": {
    "@type": "urn:example:types:blog",
    "@id": "http://example.org/blog/",
    "displayName": "Martin's Blog"
  }
}
```

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}

## 2.3 An extended activity

Fig. 3 A more extensive, single-entry "Activity Stream" follows.

### EXAMPLE 3

```
{
  "@type": "http://activitystrea.ms/2.0/Collection",
  "totalItems": 1,
  "items": [
    {
      "@type": "http://activitystrea.ms/2.0/Activity",
      "language": "en",
      "verb": "post",
      "published": "2011-02-10T15:04:55Z",
      "generator": "http://example.org/activities-app",
      "provider": "http://example.org/activity-stream",
      "displayName": {
        "en": "Martin posted a new video to his album.",
        "ga": "Martin phost le fisean nua a albam."
      },
      "actor": {
        "@type": "urn:example:types:person",
        "@id": "urn:example:person:martin",
        "displayName": "Martin Smith",
        "url": {
          "@id": "http://example.org/martin",
          "@type": "http://activitystrea.ms/2.0/Link",
          "displayName": "Martin's Profile"
        }
      },
      "image": {
        "@id": "http://example.org/martin/image",
        "@type": [
          "http://activitystrea.ms/2.0/Link",
          "http://example.org/ImageResource"
        ],
        "mediaType": "image/jpeg",
        "width": 250,
        "height": 250
      },
      "object": {
        "@type": "http://example.org/Photo",
        "@id": "http://example.org/album/my_fluffy_cat.jpg",
        "image": {
          "@id": "http://example.org/album/my_fluffy_cat_thumb.jpg",
          "@type": "http://activitystrea.ms/2.0/Link",
          "mediaType": "image/jpeg",
          "rel": "preview"
        }
      },
      "target": {
        "@type": "http://example.org/PhotoAlbum",
        "@id": "http://example.org/album/",
        "displayName": {
          "en": "Martin's Photo Album",
          "ga": "Grianghraif Mairtin"
        },
        "image": {
          "@id": "http://example.org/album/thumbnail.jpg",
          "@type": "http://activitystrea.ms/2.0/Link",
          "mediaType": "image/jpeg"
        }
      }
    ]
  }
}
```



### 3. Model

The [Activity Vocabulary](#) defines the abstract model for Activity Streams 2.0. The vocabulary document defines seven distinct abstract classes: `Object`, `Link`, `Collection`, `Activity`, `NaturalLanguageValue`, `Verb`, and `ObjectType`. Each of these classes is described and illustrated below.

#### 3.1 *Object*

The `Object` class is the primary base class for the Activity Streams vocabulary. An implementation would typically create its own set of subclasses that derive from the <http://activitystrea.ms/2.0/Object> class as opposed to using `Object` directly.

In addition to having a global identifier in the form of an absolute IRI and an "object type" (expressed in JSON-LD using the `@type` keyword), all instances of the `Object` class share a common set of properties as defined by the [Activity Vocabulary](#). These include: [action](#) | [alias](#) | [attachment](#) | [author](#) | [content](#) | [displayName](#) | [duration](#) | [endTime](#) | [generator](#) | [height](#) | [icon](#) | [image](#) | [inReplyTo](#) | [language](#) | [location](#) | [memberOf](#) | [provider](#) | [published](#) | [rating](#) | [replies](#) | [resultOf](#) | [scope](#) | [startTime](#) | [summary](#) | [tag](#) | [title](#) | [updated](#) | [validAfter](#) | [validBefore](#) | [validFrom](#) | [validUntil](#) | [width](#) | [url](#)

While all properties are optional, all `Object` instances **SHOULD** at least contain a [displayName](#).

Fig. 4 Following is an example `Object` that uses the JSON-ID `@id` and `@type` JSON-LD keywords to express the global identifier and object type:

#### EXAMPLE 4

```
{
  "@id": "http://example.org/foo",
  "@type": "http://example.org/types/Note",
  "language": "en",
  "displayName": "This is a note",
  "author": {
    "@id": "urn:example:person:joe",
    "@type": "http://example.org/types/Person",
    "displayName": "Joe Smith"
  },
  "published": "2014-08-21T12:34:56Z"
}
```

#### 3.2 *Natural Language Values*

Several properties defined by the [Vocabulary](#) are defined as being a [Natural Language Value](#). These are a representations of human-readable character sequences using one or more languages. Within the JSON-LD serialization, they are expressed as either (1) a single JSON string or (2) a JSON object mapping [RFC5646] Language-Tags to localized, equivalent translations of the same string

value. In [JSON-LD], such constructs are referred to as "Language Maps".

For instance, the `displayName` property is a Natural Language value.

Fig. 5 A single String value using the default language:

#### EXAMPLE 5

```
{
  "language": "en",
  "displayName": "This is the title"
}
```

Fig. 6 Multiple, language-specific values:

#### EXAMPLE 6

```
{
  "displayName": {
    "en": "This is the title",
    "fr": "C'est le titre",
    "sp": "Este es el titulo"
  }
}
```

Every key in the JSON object **MUST** be an [RFC5646] Language-Tag. The associated values **MUST** be Strings.

### 3.2.1 Implementation Note

*This section is non-normative.*

Implementers ought to note that, in [JSON-LD], establishment of a default language requires the use of the `@language` keyword inside the JSON-LD `@context`. For instance:

Fig. 7 Using the `@language` keyword:

#### EXAMPLE 7

```
{
  "@context": {
    "@language": "en"
  },
  "displayName": "This is the title"
}
```

Using the `@language` keyword in this manner establishes the default language context for all string literal property values contained by the object, including those that may not be intended as natural language values. This current definition for `@language` makes it difficult for implementations that choose to ignore JSON-LD semantics when processing Activity Streams documents or that wish to limit the language context only to properties that are truly intended as natural language values. The `language` property introduced by the Activity Streams Vocabulary is provided to address these shortcomings by allowing a default language to be established independently of the JSON-LD `@context`.

Fig. 8 Using the `language` property has the same effect as using the `@language` inside the JSON-LD `@context`:

#### EXAMPLE 8

```
{
  "language": "en",
  "displayName": "This is the title"
}
```

However, use of `language` means that JSON-LD based implementations will need to take an additional processing step to ensure that properties such as `title`, `displayName`, `summary` and `content` are handled properly.

Fig. 9 For instance, the following example JavaScript function extracts the value of the `language` property and injects it as an appropriate JSON-LD `@language` keyword into specific properties that are defined as Natural Language Values to ensure that such properties are properly handled by the standardized JSON-LD algorithms:

#### EXAMPLE 9

```
function _fixdefaultlanguage(lang, obj) {
  var __lang = obj['language'] || lang;
  for (var n in obj) {
    if (nlvs.indexOf(n) > -1) {
      var vals = obj[n];
      vals.forEach(function(val) {
        val['@language'] = val['@language'] || __lang;
      });
    } else if (typeof obj[n] === 'object') {
      var next = exp[n];
      if (!Array.isArray(next))
        next = [next];
      next.forEach(
        _fixdefaultlanguage.bind(
          null, __lang));
    }
  }
}
```

### 3.3 Link

A `Link` represents a dereferenceable pointer to another resource. Within the JSON-LD serialization, they are expressed as either: (1) a String containing an absolute or relative IRI, (2) a JSON object, or (3) an Array containing a mixture of IRIs or JSON objects. Links are closely related to the conceptual model of Links as established in [RFC5988].

The target URI of the Link is the global identifier expressed in the JSON-LD serialization using the `@id` keyword. In addition, all `Link` instances share the following common set of properties as defined by the [Activity Vocabulary](#): `displayName` | `hreflang` | `language` | `mediaType` | `rel` | `title`

For example, all `Objects` can contain an `image` property whose value describes a graphical representation of the containing object. This property will typically be used to provide the URL to a JPEG, GIF or PNG type resource that can be displayed to the user. Any given object might have multiple such visual representations -- multiple

screenshots, for instance, or the same image at different resolutions. Using Links, there are essentially three ways of describing such references.

Fig. 10 To reference a single image without any additional metadata, the link value can be expressed as a simple JSON string containing an absolute or relative IRI:

#### EXAMPLE 10

```
{
  "@type": "http://example.org/types/application",
  "@id": "http://example.org/application/123",
  "displayName": "My Application",
  "image": "http://example.org/application/123.png"
}
```

Fig. 11 Alternatively, if additional metadata is required, the link can be expressed as a JSON object:.

#### EXAMPLE 11

```
{
  "@type": "http://example.org/types/application",
  "@id": "http://example.org/application/123",
  "displayName": "My Application",
  "image": {
    "@id": "http://example.org/application/123.png",
    "@type": "http://activitystrea.ms/2.0/Link",
    "mediaType": "image/png"
  }
}
```

Formally, the former example establishes a unqualified relationship to the image resource while the latter creates a qualified relationship that allows additional properties to be specified for the link. Such properties (e.g. `mediaType`, `hreflang`, `rel`, etc) describe the Link relationship itself as opposed to describing the referenced resource. For many practical applications, this distinction will likely be fairly insignificant but it is still worth keeping in mind.

Fig. 12 If more than one link value is to be expressed, A JSON Array with a mix of string and object elements can be used:

#### EXAMPLE 12

```
{
  "@type": "http://example.org/types/application",
  "@id": "http://example.org/application/123",
  "displayName": "My Application",
  "image": [
    "http://example.org/application/abc.gif",
    {
      "@id": "http://example.org/application/123.png",
      "@type": "http://activitystrea.ms/2.0/Link",
      "mediaType": "image/png"
    }
  ]
}
```



Individual items contained in such an array are independent of the others and no significance is given to the ordering of those items.

RFC 5988 defines that all Links have a "link relation" that describes the contextual purpose of the link. Within a Link, the `rel` property provides the link relation value. If no `rel` property is specified, the Link is not considered to have a specified link relation.

In the following example, two separate links are provided. The link relation of the first is unspecified, while the link relation of the second is `preview`. Either link, however, can be used as alternative visual representations of the object.

Fig. 13

## EXAMPLE 13

```
{
  "@type": "urn:example:types:application",
  "image": [
    "http://example.org/foo.jpg",
    {
      "@id": "http://example.org/screens/1.jpg",
      "@type": "http://activitystrea.ms/2.0/Link",
      "rel": "preview",
      "mediaType": "image/jpeg"
    }
  ]
}
```

It ought to be noted that the [HTML5] specification provides it's own alternative definition of a "link relation" that differs slightly from the [RFC5988] definition. In the HTML5 definition, any string that does not contain the "space" U+0020, "tab" (U+0009), "LF" (U+000A), "FF" (U+000C), "CR" (U+000D) or "," (U+002C) characters can be used as a valid link relation. To promote interoperability, Activity Streams 2.0 implementations **MUST** only use link relations that are valid in terms of both the [RFC5988] and [HTML5] definitions.

Also note that it is possible to use Link and Object together to indicate that a particular JSON object can be interpreted as both. For instance, in the following example, the value of the `image` property is marked as being both a Link and a hypothetical `urn:example:image` object that, for the sake of this example, derives from `Object`. This allows additional properties describing the `Object` -- such as `height` and `width` -- to be specified.

Fig. 14

## EXAMPLE 14

```
{
  "@type": "urn:example:types:application",
  "image": [
    "http://example.org/foo.jpg",
    {
      "@id": "http://example.org/screens/1.jpg",
      "@type": [
        "http://activitystrea.ms/2.0/Link",
        "urn:example:image"
      ],
      "rel": "preview",
      "mediaType": "image/jpeg",
      "height": 200,

```

```

    "width": 200
  }
}

```

### 3.4 Activity

Activity objects are specializations of the base [Object](#) type that provide information about ongoing or completed actions.

In addition to common properties supported by all [Object](#) instances, [Activity](#) objects support the following additional properties defined by the [Vocabulary](#): [verb](#) | [actor](#) | [object](#) | [target](#) | [result](#) | [instrument](#) | [participant](#) | [priority](#) | [status](#) | [to](#) | [bto](#) | [cc](#) | [bcc](#)

The [verb](#) property is used to identify the type of activity. If the [verb](#) is not specified, the [@type](#) keyword **MAY** be used as an alternative means of determining the activity type.

Fig. 15 The following example illustrates a simple Activity:

#### EXAMPLE 15

```

{
  "@type": "http://activitystrea.ms/2.0/Activity",
  "@id": "urn:example:activity:1",
  "verb": {
    "@id": "urn:example:verb:like",
    "displayName": "like"
  },
  "actor": "http://example.org/profiles/joe",
  "object": "http://example.com/notes/1",
  "published": "2014-09-30T12:34:56Z"
}

```

#### 3.4.1 Implementation Note

*This section is non-normative.*

Since Activity Streams 1.0, the [verb](#) property has been defined to permit identifiers either in the form of absolute IRI's or simple [isegment-nz-nc](#) tokens. For instance, ["post"](#) is a valid Activity Streams verb.

However, existing JSON-LD processing algorithms have difficulty processing such [isegment-nz-nc](#) token values properly without additional processing. It is **RECOMMENDED** that JSON-LD implementations handle simple [isegment-nz-nc](#) verbs as "blank nodes". For instance, the value ["post"](#) would map to the blank node identified as [\\_:post](#).

#### 3.4.2 Audience Targeting

Every Activity has both a Primary and Secondary audience. The Primary audience consists of those entities either directly involved in the performance of the activity or who "own" the objects involved. The Secondary audience consists of the collection of entities sharing an interest in the activity but who are not directly involved (e.g. "followers").

For instance, suppose a social network of three individuals: Bob, Joe and Jane. Bob and Joe are each friends with Jane but not friends with one another. Bob has chosen to "follow" activities for which Jane is directly involved. Jane shares a file with Joe.

In this example, Jane and Joe are each directly involved in the file sharing activity and together make up the Primary Audience for that event. Bob, having an interest in activities involving Jane, is the Secondary Audience. Knowing this, a system that produces or consumes the activity can intelligently notify each person of the event.

While there are means, based on the verb, actor, object and target of the activity, to infer the primary audience for many types of activities, those do not work in every case and do not provide a means of identifying the secondary audience. The `to`, `cc`, `bto` and `bcc` properties **MAY** be used within an Activity to explicitly identify the Primary and Secondary audiences.

The prototypical use case for an Activity containing these properties is the publication and redistribution of Activities through an intermediary. That is, an event source generates the activity and publishes it to the intermediary which determines a subset of events to display to specific individual users or groups. Such a determination can be made, in part, by identifying the Primary and Secondary Audiences for each activity.

When the event source generates the activity and specifies values for the `to` and `cc` fields, the intermediary **SHOULD** redistribute that event with the values of those fields intact, allowing any processor to see who the activity has been targeted to. This is precisely the same model used by the `to` and `cc` fields in email systems.

There are situations, however, in which disclosing the identity of specific members of the audience may be inappropriate. For instance, a user may not wish to let other users know that they are interested in various topics, individuals or types of events. To support this option, an event source generating an activity **MAY** use the `bto` and `bcc` properties to list entities to whom the activity should be privately targeted. When an intermediary receives an activity containing these properties, it **MUST** remove those values prior to redistributing the activity. The intent is that systems **MUST** consider entities listed within the `bto` and `bcc` properties as part of the Primary and Secondary audience but **MUST NOT** disclose that fact to any other party.

Audience targeting information included within an Activity only describes the intent of the activity creator. With clear exception given to the appropriate handling of `bto` and `bcc`, this specification leaves it up to implementations to determine how the audience targeting information is used.

### 3.5 Collection

Collection objects are a specialization of the base Object that contain a listing of other Objects. The Collection object is used primarily as the root of an Activity Streams Document, but can also be used as the value of object properties.

Collections have both a logical model and a physical serialization. While the logical view of a collection might contain a large number of objects, any single serialized representation might include only a subset of those objects, with specific "paging" Links used to reference additional serialized representations that include additional subsets. Such representations are known as "multi-page collections", with each serialized subset representing a single "page".

All Collection objects have an `items` property whose value is a JSON array of Objects of any type. The `items` property **MUST** be supported by all implementations.

In addition to the common properties shared by all Object instances, **Collection** objects set of properties defined by the **Vocabulary**. These include: [items](#) | [totalItems](#) | [itemsPerPage](#) | [startIndex](#) | [itemsAfter](#) | [itemsBefore](#) | [current](#) | [next](#) | [prev](#) | [first](#) | [last](#) | [self](#)

Fig. 16 The following is a simple collection with paging:

#### EXAMPLE 15

```
{
  "@type": "http://activitystrea.ms/2.0/Collection",
  "totalItems": 10,
  "itemsPerPage": 1,
  "itemsSince": "2012-12-12T12:34:56Z",
  "next": "http://example.org/foo?page=2",
  "self": "http://example.org/foo?page=1",
  "items": [
    {
      "actor": "urn:example:person:sally",
      "verb": "post",
      "object": "http://example.org/foo"
    }
  ]
}
```

### 3.6 Verbs and Object Types

A **Verb** is a subclass of **Object** used to specifically describe metadata associated with an **Activity** **verb** identifier.

Fig. 17 For instance, the following describes the "urn:example:verbs:upload" verb identifier:

```
{
  "@type": "http://activitystrea.ms/2.0/Verb",
  "@id": "urn:example:verbs:upload",
  "displayName": "Upload",
  "alias": "upload"
}
```

Likewise, a **ObjectType** is a subclass of **Object** used to describe metadata associated with an **Object** **@type** identifier.

Fig. 18 For instance, the following describes the "urn:example:types:note" object type:

```
{
  "@type": "http://activitystrea.ms/2.0/ObjectType",
  "@id": "urn:example:types/note",
  "displayName": "Note"
}
```

### 3.7 Potential Actions

Ed.Note: This section is currently provisional and may be moved to a separate

document.

All **Object** instances can have an **action** property used to describe the kinds of potential activities that can be taken with regards to the object. The value is expressed as a JSON object conforming to the **PotentialAction** class defined by the Actions Vocabulary.

Fig. 19 For instance, the following illustrates hypothetical object with `"urn:example:types:note"` as the objectType, and potential actions `"urn:example:actions:ShareAction"` and `"urn:example:actions:SaveAction"`:

#### EXAMPLE 16

```
{
  "@type": "urn:example:types:note",
  "@id": "urn:example:notes:1",
  "action": [
    {
      "@type": "urn:example:actions:ShareAction",
      "using": {
        "@type": "http://activitystrea.ms/2.0/HttpRequest",
        "method": "POST",
        "url": "http://example.org/share?id=1"
      }
    },
    {
      "@type": "urn:example:actions:SaveAction",
      "using": {
        "@type": "http://activitystrea.ms/2.0/EmbeddedView",
        "content": "<p>...</p>",
        "mediaType": "text/html"
      }
    }
  ]
}
```

Please refer to the [Actions Vocabulary](#) for more detail on the Potential Actions model.

## 4. Activity Streams Document

An **Activity Streams Document** is a JSON-LD document whose root value is a [Collection](#) and whose MIME media type is `"application/activity+json"`.

## 5. Deprecated Activity Streams 1.0 Syntax

The JSON syntax defined by this specification differs somewhat from that defined in the original JSON Activity Streams 1.0 [\[AS1\]](#) specification in ways that are not backwards compatible. Implementations can choose to continue supporting the JSON Activity Streams 1.0 syntax but **SHOULD** consider it to be deprecated. This means that while implementations **MAY** continue to consume the 1.0 syntax, they **SHOULD NOT** output the 1.0 syntax unless specifically interacting with older non-2.0 compliant implementations.

Specifically:

1. Implementations **MUST** use the `"application/stream+json"` MIME media type when producing a JSON serialization using the Activity Streams 1.0 syntax,

- and `"application/activity+json"` when producing a serialization conforming to the 2.0 syntax.
2. Implementations that process serializations identified using either the `"application/stream+json"` or the more generic `"application/json"` MIME media type **MUST** follow the syntax and processing rules set by [AS1]. The 2.0 syntax and processing rules apply only when handling serializations using the `"application/activity+json"` media type.
  3. Implementations **MUST** treat the `id` and `objectType` properties defined by Activity Streams 1.0 as aliases for the JSON-LD keywords `@id` and `@type`, respectively.
  4. This document redefines the `displayName`, `title`, `content` and `summary` properties as Natural Language Values, which means their values can be expressed as either a String or a JSON-LD Language Map. In the 1.0 syntax, these are expressed solely as String values. Because the 1.0 values are a valid subset allowed by this specification, implementations are not required to take any specific action to continue supporting those values.
  5. This document redefines a large number of common properties defined originally as Objects in 1.0 as either Objects or Links. The JSON-LD serialization **allows** such property values to be expressed as either an IRI String, an JSON object, or an Array of IRI Strings and JSON objects. Because the 1.0 values are a valid subset allowed by this specification, existing implementations are not required to take any specific action to continue supporting those values.
  6. This specification deprecates the `upstreamDuplicates` and `downstreamDuplicates` properties defined by Activity Streams 1.0 and does not provide a replacement. This is due largely to lack of any reasonable implementation evidence. While the `upstreamDuplicates` and `downstreamDuplicates` properties **MAY** continue to be used, implementations **SHOULD** avoid them.

By following these requirements, all JSON Activity Streams 1.0 serializations can be processed successfully by 2.0 implementations.

## 6. Extensibility

Processors that encounter unfamiliar property names or values **MUST NOT** stop processing or signal an error and **MUST** continue processing the items as if those properties were not present.

### 6.1 Handling of JSON-ID Compact IRIs

In JSON-LD, a "Compact IRI" is a type of shorthand notation that allows absolute IRI values to be split into an absolute base IRI and a relative token. For instance, in the following example:

Fig. 20

#### EXAMPLE 17

```
{
  "@context": {
    "foaf": "http://xmlns.com/foaf/0.1/"
  },
  "foaf:givenName": "Sam"
}
```

The property name `foaf:givenName` is a Compact IRI that expands to "`http://xmlns.com/foaf/0.1/givenName`" when processed by a JSON-LD implementation.

While there are differences of opinion on how extensively Compact IRIs ought to be used within JSON-LD document instances, JSON-LD implementations are required to support them.

In order to simplify implementation and encourage interoperable reuse, the following predefined prefixes are defined for Activity Streams 2.0 as an "Initial Context":

Prefix	Expanded
<code>as:</code>	<code>http://activitystrea.ms/2.0/</code>
<code>asl:</code>	<code>http://activitystrea.ms/1.0/</code>
<code>dc:</code>	<code>http://purl.org/dc/elements/1.1/</code>
<code>dct:</code>	<code>http://purl.org/dc/terms/</code>
<code>dctypes:</code>	<code>http://purl.org/dc/dcmitype/</code>
<code>foaf:</code>	<code>http://xmlns.com/foaf/0.1/</code>
<code>vcard:</code>	<code>http://www.w3.org/2006/vcard/ns#</code>
<code>org:</code>	<code>http://www.w3.org/ns/org#</code>
<code>prov:</code>	<code>http://www.w3.org/ns/prov#</code>
<code>geo:</code>	<code>http://www.w3.org/2003/01/geo/wgs84_pos#</code>
<code>geos:</code>	<code>http://www.opengis.net/ont/geosparql#</code>

For instance, the property name `foaf:givenName` would expand to "`http://xmlns.com/foaf/0.1/givenName`", while the property `prov:actingOnBehalfOf` would expand to "`http://w3.org/ns/prov#actingOnBehalfOf`".

## 7. Security Considerations

Publishers or Consumers implementing Activity Streams as a stream of public data may also want to consider the potential for unsolicited commercial or malicious content and should take preventative measures to recognize such content and either identify it or not include it in their implementations.

Publishers should take reasonable measures to ensure potentially malicious user input such as cross-site scripting attacks are not included in the Activity Streams data they publish.

Consumers that re-emit ingested content to end-users **MUST** take reasonable measures if emitting ingested content to make sure potentially malicious ingested input is not re-emitted.

Consumers that re-emit ingested content for crawling by search engines should take reasonable measures to limit any use of their site as a Search Engine Optimization loophole. This may include converting untrusted hyperlinks to text or including a `rel="nofollow"` attribute.

Consumers should be aware of the potential for spoofing attacks where the attacker publishes activities or objects with falsified property values with the intent of injecting malicious content, hiding or corrupting legitimate content, or misleading users.

Activity Streams are JSON Documents and are subject to the same security



considerations described in [RFC7159].

Activity Streams implementations handle URIs. See Section 7 of [RFC3986].

Activity Streams implementations handle IRIs. See Section 8 of [RFC3987].

## 8. IANA Considerations

### 8.1 The `application/activity+json` Media Type

This specification registers the `application/activity+json` MIME Media Type:

Type name:	application
Subtype name:	activity+json
Required parameters:	None
Optional parameters:	None
Encoding considerations:	Resources that use the " <code>application/activity+json</code> " Media Type are required to conform to all of the requirements for the " <code>application/json</code> " Media Type and are therefore subject to the same encoding considerations specified in Section 11 of [RFC7159].
Security considerations:	As defined in this specification.
Contact:	James M Snell < <a href="mailto:jasnell@gmail.com">jasnell@gmail.com</a> >

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## B. Summary of Changes

### 2014-09-30

- Rework serialization model to be based on JSON-LD.
- Updated [vocabulary model](#).
- Remove notion of "Type Values".
- Redefine "Link Values" as "Link".
- Removed the "duplicates" property introduced in earlier AS2 drafts due to lack of any implementation evidence.
- Vocabulary: rename "attachments" to "attachment" and "tags" to "tag", deprecate the old names.
- Vocabulary: define "url", "image" and "icon" as having Link values. The clean up here ought to resolve the confusion over the relationship between `@id`, `url`, `self`, etc.
- Vocabulary: The `mediaType` and `rel` properties are defined on `Link` and not `Object`.

## C. Table of Figures

Fig. 1 Expresses the statement "'urn:example:person:martin' posted 'http://example.org/foo.jpg'". No additional detail is given.

Fig. 2 Expresses the statement "Martin Smith posted an article to the blog 'Martin's Blog' at 3:04 PM GMT on February 2, 2011." Some additional details about the article, actor and target blog are given using properties defined by the Activity Streams 2.0 Vocabulary.

Fig. 3 A more extensive, single-entry "Activity Stream" follows.

Fig. 4 Following is an example Object that uses the JSON-ID `@id` and `@type` JSON-LD keywords to express the global identifier and object type:

Fig. 5 A single String value using the default language:

Fig. 6 Multiple, language-specific values:

Fig. 7 Using the `@language` keyword:

Fig. 8 Using the `language` property has the same effect as using the `@language` inside the JSON-LD `@context`:

Fig. 9 For instance, the following example JavaScript function extracts the value of the `language` property and injects it as an appropriate JSON-LD `@language` keyword into specific properties that are defined as Natural Language Values to ensure that such properties are properly handled by the standardized JSON-LD algorithms:

Fig. 10 To reference a single image without any additional metadata, the link value can be expressed as a simple JSON string containing an absolute or relative IRI:

Fig. 11 Alternatively, if additional metadata is required, the link can be expressed as a JSON object:

Fig. 12 If more than one link value is to be expressed, A JSON Array with a mix

of string and object elements can be used:

Fig. 13

Fig. 14

Fig. 15 The following example illustrates a simple Activity:

Fig. 16 The following is a simple collection with paging:

Fig. 17 For instance, the following describes the "urn:example:verbs:upload" verb identifier:

Fig. 18 For instance, the following describes the "urn:example:types:note" object type:

Fig. 19 For instance, the following illustrates hypothetical object with

"urn:example:types:note" as the objectType, and potential actions

"urn:example:actions:ShareAction" and "urn:example:actions:SaveAction":

Fig. 20

## D. References

### D.1 Normative references

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#### [JSON-LD]

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#### [RFC3986]

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#### [RFC5988]

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#### [RFC7159]

T. Bray, Ed.. *The JavaScript Object Notation (JSON) Data Interchange Format*. March 2014. Proposed Standard. URL: <http://www.ietf.org/rfc/rfc7159.txt>

### D.2 Informative references

#### [RFC5646]

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# Appendix 4

## W3C Activity Vocabulary

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

### Activity Vocabulary

W3C First Public Working Draft 23 October 2014

**This version:**

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary-20141023/>

**Latest published version:**

<http://www.w3.org/TR/activitystreams-vocabulary/>

**Latest editor's draft:**

<http://jasnell.github.io/w3c-socialwg-activitystreams/activitystreams2-vocabulary.html>

**Editor:**

[James M Snell](#), IBM

**Repository:**

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### Abstract

This specification describes the Activity vocabulary.

### Author's Note

*This section is non-normative.*

This draft is heavily influenced by the JSON Activity Streams 1.0 specification originally co-authored by Martin Atkins, Will Norris, Chris Messina, Monica Wilkinson, Rob Dolin and James Snell. The author is very thankful for their significant contributions and gladly stands on their shoulders. Some portions of the original text of Activity Streams 1.0 are used in this document.

### Status of This Document

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- A. [References](#)
  - A.1 [Normative references](#)

## 1. Introduction

The Activity Streams 2.0 Core defines the JSON syntax for Activity Streams. This document defines the vocabulary terms.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [\[RFC2119\]](#).

### 1.1 Value Conventions

This specification uses IRIs [\[RFC3987\]](#). Every URI [\[RFC3986\]](#) is also an IRI, so a URI may be used wherever an IRI is named. There are two special considerations: (1) when an IRI that is not also a URI is given for dereferencing, it **MUST** be mapped to a URI using the steps in Section 3.1 of [\[RFC3987\]](#) and (2) when an IRI is serving as an "id" value, it **MUST NOT** be so mapped.

Unless otherwise specified, all terms defined as **timestamp** values **MUST** conform to the "date-time" production in [\[RFC3339\]](#), with an uppercase "T" character used to separate date and time, and an uppercase "Z" character in the absence of a numeric time zone offset. All such timestamps **SHOULD** be represented relative to Coordinated Universal Time (UTC).

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

## 2. Classes

Base URI: <http://activitystrea.ms/2.0/>.

Classes: [Object](#) | [Link](#) | [Activity](#) | [Collection](#) | [NaturalLanguageValue](#) | [Verb](#) | [ObjectType](#)

Class	Description		Terms
<b>Object</b>	URI:	<a href="http://activitystrea.ms/2.0/Object">http://activitystrea.ms/2.0/Object</a>	<a href="#">language</a>   <a href="#">displayName</a>   <a href="#">alias</a>   <a href="#">author</a>   <a href="#">content</a>   <a href="#">summary</a>   <a href="#">title</a>   <a href="#">icon</a>   <a href="#">image</a>   <a href="#">location</a>   <a href="#">generator</a>   <a href="#">provider</a>   <a href="#">published</a>   <a href="#">updated</a>   <a href="#">startTime</a>   <a href="#">endTime</a>   <a href="#">validFrom</a>   <a href="#">validAfter</a>   <a href="#">validUntil</a>   <a href="#">validBefore</a>   <a href="#">duration</a>   <a href="#">rating</a>   <a href="#">attachment</a>   <a href="#">height</a>   <a href="#">width</a>   <a href="#">tag</a>   <a href="#">inReplyTo</a>   <a href="#">scope</a>   <a href="#">action</a>   <a href="#">memberOf</a>   <a href="#">url</a>   <a href="#">resultOf</a>   <a href="#">replies</a>
	Notes:	Describes an object of some kind. The Object class serves as a base class for many of the other kinds of objects defined in the Activity and Actions Vocabulary.	
<b>Link</b>	URI:	<a href="http://activitystrea.ms/2.0/Link">http://activitystrea.ms/2.0/Link</a>	<a href="#">rel</a>   <a href="#">mediaType</a>   <a href="#">language</a>   <a href="#">displayName</a>   <a href="#">title</a>   <a href="#">hreflang</a>
	Notes:	Describes a link to a separate resource.	
<b>Activity</b>	URI:	<a href="http://activitystrea.ms/2.0/Activity">http://activitystrea.ms/2.0/Activity</a>	<a href="#">verb</a>   <a href="#">actor</a>

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

Class	Description		Terms
			<a href="#">  object  </a> <a href="#">target  </a> <a href="#">result  </a> <a href="#">instrument  </a> <a href="#">participant  </a> <a href="#">  priority  </a> <a href="#">status   to</a> <a href="#">  bto   cc  </a> <a href="#">bcc</a>
	Notes:	Describes some form of action that is currently happening or that has already happened.	<i>From <a href="#">Object</a>:</i> <a href="#">language  </a> <a href="#">displayName</a> <a href="#">  alias  </a> <a href="#">author  </a> <a href="#">content  </a> <a href="#">summary  </a> <a href="#">title   icon</a> <a href="#">  image  </a> <a href="#">location  </a> <a href="#">generator  </a> <a href="#">provider  </a> <a href="#">published  </a> <a href="#">updated  </a> <a href="#">startTime  </a> <a href="#">endTime  </a> <a href="#">validFrom  </a> <a href="#">validAfter  </a> <a href="#">validUntil  </a> <a href="#">validBefore</a> <a href="#">  duration  </a> <a href="#">rating  </a> <a href="#">attachment  </a> <a href="#">height  </a> <a href="#">width   tag</a> <a href="#">  inReplyTo</a> <a href="#">  scope  </a> <a href="#">action  </a> <a href="#">memberOf  </a> <a href="#">url  </a> <a href="#">resultOf  </a> <a href="#">replies</a>
	Type Of:	<a href="#">Object</a>	
<b>Collection</b>	URI:	<a href="http://activitystrea.ms/2.0/Collection">http://activitystrea.ms/2.0/Collection</a>	<a href="#">items  </a> <a href="#">totalItems  </a> <a href="#">itemsPerPage</a> <a href="#">  startIndex</a> <a href="#">  itemsAfter</a> <a href="#"> </a> <a href="#">itemsBefore</a>

Class	Description		Terms
			<a href="#">  current  </a> <a href="#">next   prev</a> <a href="#">  first  </a> <a href="#">last   self</a>
	Notes:	An unordered collection of <a href="#">Object</a> instances.	<i>From <a href="#">Object</a>:</i> <a href="#">language  </a> <a href="#">displayName</a> <a href="#">  alias  </a> <a href="#">author  </a> <a href="#">content  </a> <a href="#">summary  </a> <a href="#">title   icon</a> <a href="#">  image  </a> <a href="#">location  </a> <a href="#">generator  </a> <a href="#">provider  </a> <a href="#">published  </a> <a href="#">updated  </a> <a href="#">startTime  </a> <a href="#">endTime  </a> <a href="#">validFrom  </a> <a href="#">validAfter  </a> <a href="#">validUntil  </a> <a href="#">validBefore</a> <a href="#">  duration  </a> <a href="#">rating  </a> <a href="#">attachment  </a> <a href="#">height  </a> <a href="#">width   tag</a> <a href="#">  inReplyTo</a> <a href="#">  scope  </a> <a href="#">action  </a> <a href="#">memberOf  </a> <a href="#">url  </a> <a href="#">resultOf  </a> <a href="#">replies</a>
	Type Of:	<a href="#">Object</a>	
<b>NaturalLanguageValue</b>	URI:	<a href="http://activitystrea.ms/2.0/NaturalLanguageValue">http://activitystrea.ms/2.0/NaturalLanguageValue</a>	
	Notes:	A Natural Language Value is a representation of human-readable character sequences in one or more languages.	
<b>Verb</b>	URI:	<a href="http://activitystrea.ms/2.0/Verb">http://activitystrea.ms/2.0/Verb</a>	<i>From <a href="#">Object</a>:</i> <a href="#">language  </a> <a href="#">displayName</a>



Activity Vocabulary

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Class	Description		Terms
			<a href="#">  alias  </a> <a href="#">author  </a> <a href="#">content  </a> <a href="#">summary  </a> <a href="#">title  </a> <a href="#">icon</a>
	Notes:	Describes a Verb.	<a href="#">  image  </a> <a href="#">location  </a> <a href="#">generator  </a> <a href="#">provider  </a> <a href="#">published  </a> <a href="#">updated  </a> <a href="#">startTime  </a> <a href="#">endTime  </a> <a href="#">validFrom  </a> <a href="#">validAfter  </a> <a href="#">validUntil  </a> <a href="#">validBefore  </a>
	Type Of:	<a href="#">Object</a>	<a href="#">  duration  </a> <a href="#">rating  </a> <a href="#">attachment  </a> <a href="#">height  </a> <a href="#">width  </a> <a href="#">tag</a> <a href="#">  inReplyTo  </a> <a href="#">scope  </a> <a href="#">action  </a> <a href="#">memberOf  </a> <a href="#">url  </a> <a href="#">resultOf  </a> <a href="#">replies</a>
<b>ObjectType</b>	URI:	<a href="http://activitystrea.ms/2.0/ObjectType">http://activitystrea.ms/2.0/ObjectType</a>	<b>From <a href="#">Object</a>:</b> <a href="#">language  </a> <a href="#">displayName  </a> <a href="#">  alias  </a> <a href="#">author  </a> <a href="#">content  </a> <a href="#">summary  </a> <a href="#">title  </a> <a href="#">icon</a> <a href="#">  image  </a> <a href="#">location  </a> <a href="#">generator  </a> <a href="#">provider  </a> <a href="#">published  </a> <a href="#">updated  </a> <a href="#">startTime  </a> <a href="#">endTime  </a> <a href="#">validFrom  </a> <a href="#">validAfter  </a> <a href="#">validUntil  </a>
	Notes:	Describes an Object Type.	

Class	Description		Terms
			<a href="#">validBefore</a>   <a href="#">duration</a>   <a href="#">rating</a>   <a href="#">attachment</a>   <a href="#">height</a>   <a href="#">width</a>   <a href="#">tag</a>   <a href="#">inReplyTo</a>   <a href="#">scope</a>   <a href="#">action</a>   <a href="#">memberOf</a>   <a href="#">url</a>   <a href="#">resultOf</a>   <a href="#">replies</a>
	Type Of:	<a href="#">Object</a>	

### 3. Terms

Base URI: <http://activitystrea.ms/2.0/>.

Term	Description	
<b><i>language</i></b>	URI:	<a href="http://activitystrea.ms/2.0/language">http://activitystrea.ms/2.0/language</a>
	Notes:	Establishes the default language assumed for human-readable, natural-language metadata values included in the object. The value <b>MUST</b> be an <a href="#">[RFC5646]</a> Language-Tag.
	Domain:	<a href="#">Object</a>   <a href="#">Link</a>
	Range:	<a href="#">[RFC5646]</a> Language Tag
<b><i>displayName</i></b>	URI:	<a href="http://activitystrea.ms/2.0/displayName">http://activitystrea.ms/2.0/displayName</a>
	Notes:	A simple, human-readable, plain-text name for the object. HTML markup <b>MUST NOT</b> be included..
	Domain:	<a href="#">Object</a>   <a href="#">Link</a>
	Value:	<a href="#">NaturalLanguageValue</a>
<b><i>rel</i></b>	URI:	<a href="http://activitystrea.ms/2.0/rel">http://activitystrea.ms/2.0/rel</a>
	Notes:	The RFC 5988 Link Relation associated with a <a href="#">Link</a> .
	Domain:	<a href="#">Link</a>
	Value:	<a href="#">[RFC5988]</a> or <a href="#">[HTML5]</a> Link Relation
<b><i>mediaType</i></b>	URI:	<a href="http://activitystrea.ms/2.0/mediaType">http://activitystrea.ms/2.0/mediaType</a>

Term	Description	
	Notes:	<p>When used on a <a href="#">Link</a>, identifies the MIME media type of the referenced resource.</p> <p>When used on a <a href="#">Payload</a>, identifies the MIME media type of the payload described. For instance, a <a href="#">Payload</a> object with a <a href="#">mediaType</a> of "<a href="#">application/json</a>" would describe a JSON resource.</p> <p>When used on a <a href="#">EmbeddedView</a>, identifies the MIME media type of value contained in the <a href="#">content</a> property, if any.</p>
	Domain:	<a href="#">Link</a>   <a href="#">Payload</a>   <a href="#">EmbeddedView</a>
	Value:	MIME Media Type
<b><i>hreflang</i></b>	URI:	<a href="http://activitystrea.ms/2.0/hreflang">http://activitystrea.ms/2.0/hreflang</a>
	Notes:	Hints as to the language used by the target resource. Value <b>MUST</b> be a <a href="#">[RFC5646]</a> Language-Tag.
	Domain:	<a href="#">Link</a>
	Range:	<a href="#">[RFC5646]</a> Language Tag
<b><i>verb</i></b>	URI:	<a href="http://activitystrea.ms/2.0/verb">http://activitystrea.ms/2.0/verb</a>
	Notes:	Identifies the type of action represented in the Activity
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<a href="#">Verb</a>
<b><i>actor</i></b>	URI:	<a href="http://activitystrea.ms/2.0/actor">http://activitystrea.ms/2.0/actor</a>
	Notes:	Describes one or more entities that either performed or are expected to perform the activity.
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b><i>object</i></b>	URI:	<a href="http://activitystrea.ms/2.0/object">http://activitystrea.ms/2.0/object</a>
	Notes:	Describes the direct object of the activity. For instance, in the activity "John saved a movie to his wishlist", the object of the activity is the movie saved.

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

Term	Description	
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>target</b>	URI:	<a href="http://activitystrea.ms/2.0/target">http://activitystrea.ms/2.0/target</a>
	Notes:	Describes the indirect object, or target, of the activity. The precise meaning of the target is largely dependent on the <a href="#">verb</a> but will often be the object of the English preposition "to". For instance, in the activity "John saved a movie to his wishlist", the target of the activity is John's wishlist.
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>result</b>	URI:	<a href="http://activitystrea.ms/2.0/result">http://activitystrea.ms/2.0/result</a>
	Notes:	Describes the result of the activity. For instance, if a particular action results in the creation of a new resource, the <a href="#">result</a> property can be used to describe that new resource.
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
	Reverse Of:	<a href="#">resultOf</a>
<b>instrument</b>	URI:	<a href="http://activitystrea.ms/2.0/instrument">http://activitystrea.ms/2.0/instrument</a>
	Notes:	An optional <a href="#">Object</a> that describes one or more objects used to perform the activity. For instance, in the activity, "Sally played music with a piano", the instrument of the activity is the piano.
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>participant</b>	URI:	<a href="http://activitystrea.ms/2.0/participant">http://activitystrea.ms/2.0/participant</a>
	Notes:	An optional <a href="#">Object</a> that describes one or more additional actors that have (or will have) participated in the activity. For instance, in the activity, "Sally went to the movies with Joe", Sally is the primary actor, while Joe is a participant.
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>

Term	Description	
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>priority</b>	URI:	<a href="http://activitystrea.ms/2.0/priority">http://activitystrea.ms/2.0/priority</a>
	Notes:	<p>An optional indicator of the relative priority, or importance, that the creator of the activity considers it to have. Represented as a non-negative, numeric decimal between 0.00 and 1.00 (inclusive), with two decimal places of precision. If the property is omitted or set to null, the assumption is that a default priority can be assumed by the implementation. The value 0.00 represents the lowest possible priority while 1.00 represents the highest.</p> <p>The use of the <b>priority</b> property does not impose any specific processing or display requirements on the part of any consuming implementation.</p> <p>Expressing the value as a range of numeric decimal values is intended to provide the greatest level of flexibility in the expression and consumption of prioritization detail. It is expected that implementors consuming activity objects containing <b>priority</b> will utilize and expose the additional information in a number of different ways depending on the unique requirements of each application use case.</p> <p>Many existing systems do not represent priority values as numeric ranges. Such systems might use fixed, labeled brackets such as "<b>low</b>", "<b>normal</b>" and "<b>high</b>" or "<b>urgent</b>". Similar mechanisms can be established, by convention, when using the <b>priority</b> property. In typical use, it is <b>RECOMMENDED</b> that implementations wishing to work with such defined categories treat <b>priority</b> property values in the range 0.00 to 0.25 as "<b>low</b>" priority; values greater than 0.25 to 0.75 as "<b>normal</b>" priority; and values greater than 0.75 to 1.00 as "<b>high</b>" priority. Specific implementations are free to establish alternative conventions for the grouping of priority values with the caveat that such conventions likely will not be understood by all implementations.</p>
	Domain:	<a href="#">Activity</a>   <a href="#">PotentialAction</a>
	Value:	<b>xsd:decimal</b>

Term	Description	
	Domain:	0.00 <= priority <= 1.00
<b>status</b>	URI:	<a href="http://activitystrea.ms/2.0/status">http://activitystrea.ms/2.0/status</a>
	Notes:	An optional, explicit indicator of the current status of the activity. " <a href="http://activitystrea.ms/2.0/status/active">http://activitystrea.ms/2.0/status/active</a> " indicates that the activity is ongoing, " <a href="http://activitystrea.ms/2.0/status/canceled">http://activitystrea.ms/2.0/status/canceled</a> " indicates that the activity has been aborted, " <a href="http://activitystrea.ms/2.0/status/completed">http://activitystrea.ms/2.0/status/completed</a> " indicates that the activity has concluded, " <a href="http://activitystrea.ms/2.0/status/pending">http://activitystrea.ms/2.0/status/pending</a> " indicates that the activity is expected to begin, " <a href="http://activitystrea.ms/2.0/status/tentative">http://activitystrea.ms/2.0/status/tentative</a> " indicates that the activity has been proposed, and " <a href="http://activitystrea.ms/2.0/status/voided">http://activitystrea.ms/2.0/status/voided</a> " indicates that the activity has been retracted or should be considered invalid.
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">xsd:anyURI</a>
<b>to</b>	URI:	<a href="http://activitystrea.ms/2.0/to">http://activitystrea.ms/2.0/to</a>
	Notes:	Specifies the public primary audience
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">Link</a>
<b>cc</b>	URI:	<a href="http://activitystrea.ms/2.0/cc">http://activitystrea.ms/2.0/cc</a>
	Notes:	Specifies the public secondary audience
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">Link</a>
<b>bto</b>	URI:	<a href="http://activitystrea.ms/2.0/bto">http://activitystrea.ms/2.0/bto</a>
	Notes:	Specifies the private primary audience
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">Link</a>
<b>bcc</b>	URI:	<a href="http://activitystrea.ms/2.0/bcc">http://activitystrea.ms/2.0/bcc</a>
	Notes:	Specifies the private secondary audience
	Domain:	<a href="#">Activity</a>
	Value:	<a href="#">Link</a>

Term	Description	
<b>alias</b>	URI:	<a href="http://activitystrea.ms/2.0/alias">http://activitystrea.ms/2.0/alias</a>
	Notes:	Provides a contextually meaningful alternative label for the object in addition to the <code>id</code> . For instance, within some systems, groups can be identified by both a unique global identifier and a more "human-friendly" label such as " <code>@friends</code> " or " <code>@network</code> ". The value of the <code>alias</code> property <b>MUST</b> match either the <code>isegment-nz-nc</code> or <code>IRI</code> productions in [RFC3987]. The use of a relative reference other than a simple name is not allowed.
	Domain:	<a href="#">Object</a>
	Value:	<code>xsd:anyURI</code>
<b>author</b>	URI:	<a href="http://activitystrea.ms/2.0/author">http://activitystrea.ms/2.0/author</a>
	Notes:	An <a href="#">Object</a> referencing one or more entities credited with creating or authoring the object.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>content</b>	URI:	<a href="http://activitystrea.ms/2.0/content">http://activitystrea.ms/2.0/content</a>
	Notes:	A <a href="#">NaturalLanguageValue</a> description of the object content. HTML markup, including visual elements such as images, <b>MAY</b> be included.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">NaturalLanguageValue</a>
<b>summary</b>	URI:	<a href="http://activitystrea.ms/2.0/summary">http://activitystrea.ms/2.0/summary</a>
	Notes:	A <a href="#">NaturalLanguageValue</a> summarization of the object. HTML markup, including visual images such as images, <b>MAY</b> be included.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">NaturalLanguageValue</a>
<b>title</b>	URI:	<a href="http://activitystrea.ms/2.0/title">http://activitystrea.ms/2.0/title</a>
	Notes:	A <a href="#">NaturalLanguageValue</a> title of the object. HTML markup, including visual images such as images, <b>MAY</b> be included. The <code>title</code> and <code>displayName</code> properties are closely related and overlap in function with the key difference being that <code>title</code> is permitted to contain HTML markup

Term	Description	
		while <a href="#">displayName</a> is not.
	Domain:	<a href="#">Object</a>   <a href="#">Link</a>
	Value:	<a href="#">NaturalLanguageValue</a>
<b><i>icon</i></b>	URI:	<a href="http://activitystrea.ms/2.0/icon">http://activitystrea.ms/2.0/icon</a>
	Notes:	A <a href="#">Link</a> referencing one or more graphic representations of the object. The visual element <b>SHOULD</b> have an aspect ratio of one (horizontal) to one (vertical) and <b>SHOULD</b> be suitable for presentation at a small size.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Link</a>
<b><i>image</i></b>	URI:	<a href="http://activitystrea.ms/2.0/image">http://activitystrea.ms/2.0/image</a>
	Notes:	A <a href="#">Link</a> referencing one or more graphic representations of the object. Unlike the <a href="#">icon</a> property, there are no aspect ratio or display size limitations assumed.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Link</a>
<b><i>location</i></b>	URI:	<a href="http://activitystrea.ms/2.0/location">http://activitystrea.ms/2.0/location</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing one or more physical or logical locations associated with the object.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b><i>generator</i></b>	URI:	<a href="http://activitystrea.ms/2.0/generator">http://activitystrea.ms/2.0/generator</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing the resource (e.g. an application) that generated the object.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b><i>provider</i></b>	URI:	<a href="http://activitystrea.ms/2.0/provider">http://activitystrea.ms/2.0/provider</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing the resource (e.g. an application) that published the object. Note that this is not necessarily the same entity that generated the object.



Activity Vocabulary

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Term	Description	
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b><i>published</i></b>	URI:	<a href="http://activitystrea.ms/2.0/published">http://activitystrea.ms/2.0/published</a>
	Notes:	The date and time at which the object was published
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>updated</i></b>	URI:	<a href="http://activitystrea.ms/2.0/updated">http://activitystrea.ms/2.0/updated</a>
	Notes:	The date and time at which the object was updated
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>startTime</i></b>	URI:	<a href="http://activitystrea.ms/2.0/startTime">http://activitystrea.ms/2.0/startTime</a>
	Notes:	The date and time describing the actual or expected starting time of the object. When used with an <a href="#">Activity</a> object, for instance, the <a href="#">startTime</a> property specifies the moment the activity began or is scheduled to begin.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>endTime</i></b>	URI:	<a href="http://activitystrea.ms/2.0/endTime">http://activitystrea.ms/2.0/endTime</a>
	Notes:	The date and time describing the actual or expected ending time of the object. When used with an <a href="#">Activity</a> object, for instance, the <a href="#">endTime</a> property specifies the moment the activity concluded or is expected to conclude.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>validFrom</i></b>	URI:	<a href="http://activitystrea.ms/2.0/validFrom">http://activitystrea.ms/2.0/validFrom</a>
	Notes:	The date and time at or after which (inclusive) the object is considered to be valid.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>

Term	Description	
<b><i>validAfter</i></b>	URI:	<a href="http://activitystrea.ms/2.0/validAfter">http://activitystrea.ms/2.0/validAfter</a>
	Notes:	The date and time after which (exclusive) the object is considered to be valid.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>validUntil</i></b>	URI:	<a href="http://activitystrea.ms/2.0/validUntil">http://activitystrea.ms/2.0/validUntil</a>
	Notes:	The date and time at or before which (inclusive) the object is considered to be valid. Once this moment has passed, the object is considered to have expired.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>validBefore</i></b>	URI:	<a href="http://activitystrea.ms/2.0/validBefore">http://activitystrea.ms/2.0/validBefore</a>
	Notes:	The date and time at or after which the object is considered to have expired.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">timestamp</a>
<b><i>duration</i></b>	URI:	<a href="http://activitystrea.ms/2.0/duration">http://activitystrea.ms/2.0/duration</a>
	Notes:	When the object describes a time-bound resource, such as an audio or video, a meeting, etc, the <a href="#">duration</a> property indicates the object's approximate duration. The value <b>SHOULD</b> be expressed as an <a href="#">RFC3339</a> <a href="#">duration</a> (e.g. a period of 5 seconds is represented as " <a href="#">PT5S</a> ") but <b>MAY</b> be specified as a non-negative integer specifying the duration as a number of non-fractional seconds.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">xsd:integer</a>   <a href="#">xsd:duration</a>
<b><i>rating</i></b>	URI:	<a href="http://activitystrea.ms/2.0/rating">http://activitystrea.ms/2.0/rating</a>
	Notes:	A quality rating expressed as a non-negative decimal number between 0.0 and 5.0 (inclusive) with one decimal place of precision.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">xsd:decimal</a>

Term	Description	
	Comment:	0.0 <= rating <= 5.0
<b>attachment</b>	URI:	<a href="http://activitystrea.ms/2.0/attachments">http://activitystrea.ms/2.0/attachments</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing one or more objects associated with the containing object. These are similar in concept to files attached to an email.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>height</b>	URI:	<a href="http://activitystrea.ms/2.0/height">http://activitystrea.ms/2.0/height</a>
	Notes:	When the object describes a visual resource, such as an image, video or embeddable HTML, the <a href="#">height</a> property indicates the recommended display height in terms of device-independent pixels.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">xsd:nonNegativeInteger</a>
<b>width</b>	URI:	<a href="http://activitystrea.ms/2.0/width">http://activitystrea.ms/2.0/width</a>
	Notes:	When the object describes a visual resource, such as an image, video or embeddable HTML, the <a href="#">width</a> property indicates the recommended display width in terms of device-independent pixels.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">xsd:nonNegativeInteger</a>
<b>tag</b>	URI:	<a href="http://activitystrea.ms/2.0/tags">http://activitystrea.ms/2.0/tags</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing one or more resources that are loosely associated with the containing object. The <a href="#">tag</a> and <a href="#">attachment</a> properties differ from one another in that the <a href="#">tag</a> property asserts "association by reference" while <a href="#">attachment</a> asserts "association by enclosure".
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>inReplyTo</b>	URI:	<a href="http://activitystrea.ms/2.0/inReplyTo">http://activitystrea.ms/2.0/inReplyTo</a>

Term	Description	
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing one or more other objects to which the containing object can be considered a response.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>scope</b>	URI:	<a href="http://activitystrea.ms/2.0/scope">http://activitystrea.ms/2.0/scope</a>
	Notes:	An <a href="#">Object</a> or <a href="#">Link</a> referencing one or more resources that define the total population of entities for which the object can be considered to be relevant.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
<b>action</b>	URI:	<a href="http://activitystrea.ms/2.0/action">http://activitystrea.ms/2.0/action</a>
	Notes:	A <a href="#">PotentialAction</a> that can be performed with the object
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">PotentialAction</a>
	Reverse Of:	<a href="#">object</a>
<b>memberOf</b>	URI:	<a href="http://activitystrea.ms/2.0/memberOf">http://activitystrea.ms/2.0/memberOf</a>
	Notes:	Identifies a <a href="#">Collection</a> to which this Object belongs
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Collection</a>
	Reverse Of:	<a href="#">items</a>
<b>url</b>	URI:	<a href="http://activitystrea.ms/2.0/url">http://activitystrea.ms/2.0/url</a>
	Notes:	The <a href="#">url</a> property is typically used to point to a displayable representation of an object (usually an HTML page).
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Link</a>
<b>resultOf</b>	URI:	<a href="http://activitystrea.ms/2.0/resultOf">http://activitystrea.ms/2.0/resultOf</a>

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

Term	Description	
	Notes:	Identifies the Activity of which this object or link is a result.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Activity</a>
	Reverse Of:	<a href="#">result</a>

## 4. Collection Terms

Base URI: <http://activitystrea.ms/2.0/>.

Term	Description	
<b>items</b>	URI:	<a href="http://activitystrea.ms/2.0/items">http://activitystrea.ms/2.0/items</a>
	Notes:	An unordered set of <a href="#">Objects</a> contained by the collection.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">Object</a>
	Reverse Of:	<a href="#">memberOf</a>
<b>totalItems</b>	URI:	<a href="http://activitystrea.ms/2.0/totalItems">http://activitystrea.ms/2.0/totalItems</a>
	Notes:	A non-negative integer specifying the total number of objects contained by the logical view of the collection. This number might not reflect the actual number of items serialized within the <a href="#">Collection</a> object instance.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">xsd:nonNegativeInteger</a>
<b>itemsPerPage</b>	URI:	<a href="http://activitystrea.ms/2.0/itemsPerPage">http://activitystrea.ms/2.0/itemsPerPage</a>
	Notes:	A non-negative integer specifying the maximum number of items that will be included in the value of the <a href="#">items</a> array.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">xsd:nonNegativeInteger</a>
<b>startIndex</b>	URI:	<a href="http://activitystrea.ms/2.0/startIndex">http://activitystrea.ms/2.0/startIndex</a>

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

Term	Description	
	Notes:	A non-negative integer value identifying the relative position within the logical view of the collection of the first object contained in the <a href="#">items</a> array.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">xsd:nonNegativeInteger</a>
<b>itemsAfter</b>	URI:	<a href="http://activitystrea.ms/2.0/itemsAfter">http://activitystrea.ms/2.0/itemsAfter</a>
	Notes:	An RFC 3339 date-time that indicates that the collection contains only items published or updated strictly after the date and time specified.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">timestamp</a>
<b>itemsBefore</b>	URI:	<a href="http://activitystrea.ms/2.0/itemsBefore">http://activitystrea.ms/2.0/itemsBefore</a>
	Notes:	An RFC 3339 date-time that indicates that the collection contains only items published or updated strictly before the date and time specified.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">timestamp</a>
<b>replies</b>	URI:	<a href="http://activitystrea.ms/2.0/replies">http://activitystrea.ms/2.0/replies</a>
	Notes:	Provides information about the set of objects that can be considered to be replies to the containing object.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Collection</a>
<b>current</b>	URI:	<a href="http://activitystrea.ms/2.0/current">http://activitystrea.ms/2.0/current</a>
	Notes:	Provides a link to the collection page containing the most recently published or updated items.
	Domain:	<a href="#">Collection</a>
	Value:	<a href="#">Link</a>
<b>next</b>	URI:	<a href="http://activitystrea.ms/2.0/next">http://activitystrea.ms/2.0/next</a>
	Notes:	Provides a link to the next page of items in the collection
	Domain:	<a href="#">Collection</a>

Term	Description	
<b>prev</b>	Value:	<a href="#">Link</a>
	URI:	<a href="http://activitystrea.ms/2.0/prev">http://activitystrea.ms/2.0/prev</a>
	Notes:	Provides a link to the previous page of item in the collection
	Domain:	<a href="#">Collection</a>
<b>first</b>	Value:	<a href="#">Link</a>
	URI:	<a href="http://activitystrea.ms/2.0/first">http://activitystrea.ms/2.0/first</a>
	Notes:	Provides a link to the further preceeding page in the collection
	Domain:	<a href="#">Collection</a>
<b>last</b>	Value:	<a href="#">Link</a>
	URI:	<a href="http://activitystrea.ms/2.0/last">http://activitystrea.ms/2.0/last</a>
	Notes:	Provides a link to furthest page in the collection
	Domain:	<a href="#">Collection</a>
<b>self</b>	Value:	<a href="#">Link</a>
	URI:	<a href="http://activitystrea.ms/2.0/self">http://activitystrea.ms/2.0/self</a>
	Notes:	Provides a link to this page of the collection
	Domain:	<a href="#">Collection</a>

## 5. Activity Streams 1.0 Terms

Term	Description	
<b>id</b>	URI:	<a href="http://activitystrea.ms/1.0/id">http://activitystrea.ms/1.0/id</a>
	Notes:	Provides a permanent, universally unique identifier for the object in the form of an absolute IRI <a href="#">[RFC3987]</a> .
	Domain:	<a href="#">Object</a>
	Equivalent To:	<a href="#">[JSON-LD]</a> "@id"
<b>objectType</b>	URI:	<a href="http://activitystrea.ms/1.0/objectType">http://activitystrea.ms/1.0/objectType</a>

Activity Vocabulary

<http://www.w3.org/TR/2014/WD-activitystreams-vocabulary...>

Term	Description	
	Notes:	Identifies the type of object. If an object does not either the <code>objectType</code> or <code>@type</code> properties, the object has no specific type.
	Domain:	<code>Object</code>
	Equivalent To:	[JSON-LD] <code>@type</code>
<b><i>downstreamDuplicates</i></b>	URI:	<a href="http://activitystrea.ms/1.0/downstreamDuplicates">http://activitystrea.ms/1.0/downstreamDuplicates</a>
	Notes:	The downstreamDuplicates property is used when there are known objects, possibly in a different system, that duplicate the content in this object. This would be used as a hint for consumers to use when resolving duplicates between objects received from different sources. In Activity Streams 2.0, the downstreamDuplicates property is deprecated and <b>SHOULD NOT</b> be used.
	Domain:	<code>Object</code>
	Value:	<code>xsd:anyURI</code>
<b><i>upstreamDuplicates</i></b>	URI:	<a href="http://activitystrea.ms/1.0/upstreamDuplicates">http://activitystrea.ms/1.0/upstreamDuplicates</a>
	Notes:	The upstreamDuplicates property is used when there are known objects, possibly in a different system, that duplicate the content in this object. This would be used as a hint for consumers to use when resolving duplicates between objects received from different sources. In Activity Streams 2.0, the upstreamDuplicates property is deprecated and <b>SHOULD NOT</b> be used.
	Domain:	<code>Object</code>
	Value:	<code>xsd:anyURI</code>
<b><i>tags</i></b>	URI:	<a href="http://activitystrea.ms/1.0/tags">http://activitystrea.ms/1.0/tags</a>
	Notes:	In the Activity Streams 2.0 vocabulary, <code>tags</code> is renamed to the singular form <code>tag</code> for consistency.



Term	Description	
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
	Equivalent To:	<a href="#">tag</a>
<b>attachments</b>	URI:	<a href="http://activitystrea.ms/1.0/attachments">http://activitystrea.ms/1.0/attachments</a>
	Notes:	In the Activity Streams 2.0 vocabulary, <b>attachments</b> is renamed to the singular form <b>attachment</b> for consistency.
	Domain:	<a href="#">Object</a>
	Value:	<a href="#">Object</a>   <a href="#">Link</a>
	Equivalent To:	<a href="#">attachment</a>

## A. References

### A.1 Normative references

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