Implementation of collaborative policy-making tool

Decentralised Citizens ENgagement Technologies

Specific Targeted Research Project Collective Awareness Platforms

FP7 – CAPS
Project no. 610349
D-CENT
Decentralised Citizens
ENgagement Technologies

Lead beneficiary: ThoughtWorks

D5.3 Implementation of collaborative policy-making tool

May 2015
Version Number: 1

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ThoughtWorks®

The work leading to this publication has received funding from the European Union's Seventh Framework Programme (FP7/2007 – 2013) under grant agreement n° 610349.

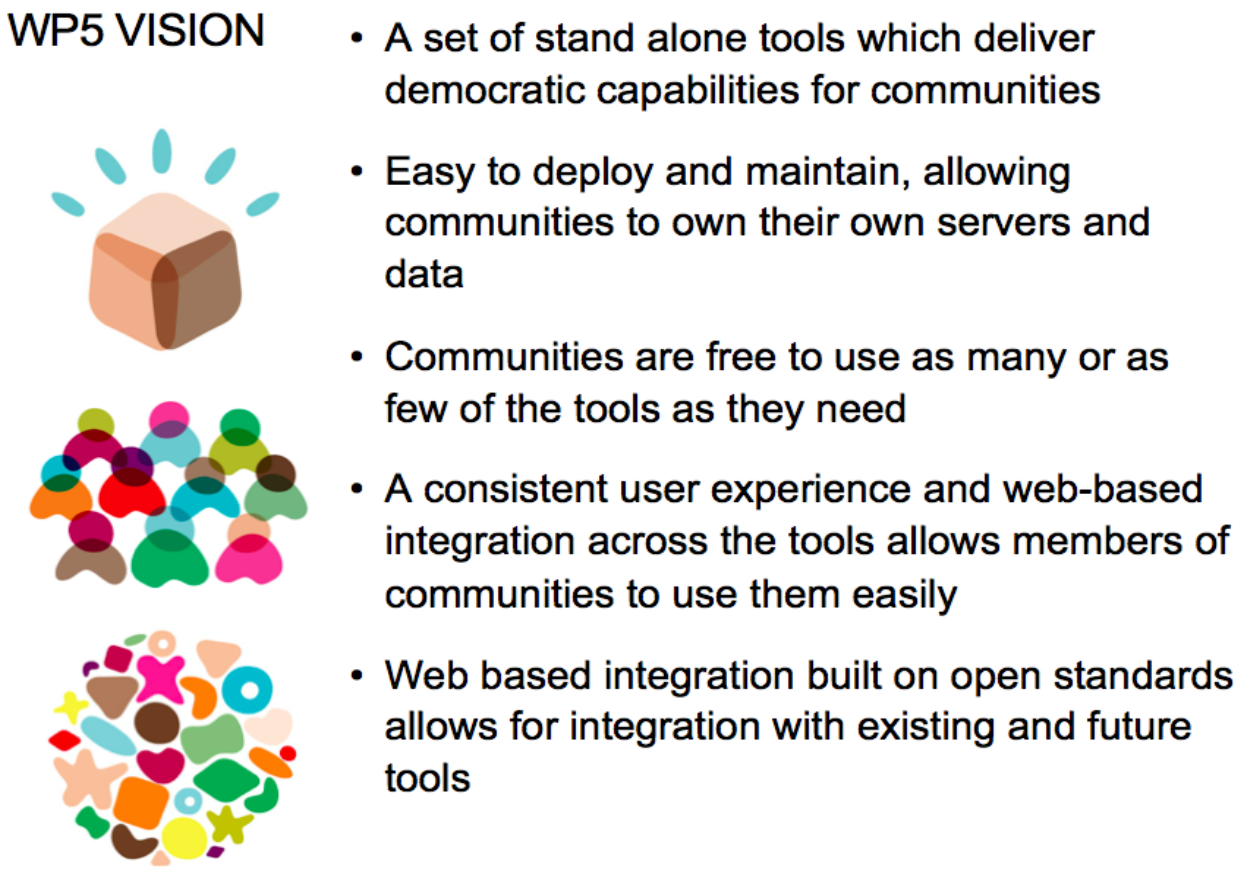
Contents

1. Introduction 3
2. Technical description of collaborative drafting tool 5
2.1 Overview of the collaborative-policy making tool 5
2.2 High Level Feature Overview 6
2.2.1 Creating Objectives 7
2.2.2 Questions and Answers 8
2.2.3 Commenting 10
2.2.4 Publishing a Draft 11
2.2.5 Annotating a Draft 13
2.2.6 Difference Highlighting between two Policy Drafts 14
2.2.7 Writer Dashboard 15
3. User research & Beta testing 16
3.1 Project Quick Start in January 16
3.2 Lab Based User Testing 17
3.3 Interviews with Policy Writers 19
3.4 Rapid paper based prototyping 19
3.5 Collaborative policy-making Pilot in Spain 21
4. D-CENT Architecture Design 22
4.1 D-CENT Platform design 22
4.2 Languages and Frameworks 23
4.3 Community Engagement 24
4.4 Security and Privacy 24
4.5 Standards Compliance 24
5. Conclusions and Future Roadmap 28
5.1 Next Steps 29
5.2 Large Scale Piloting in Spain, Finland and Iceland 30

1. Introduction

This Work Package (WP5) focuses on implementation and pilots for the D-CENT platform, and it is led by ThoughtWorks (TW). TW has extensive experience in lean and agile development. Working closely with Nesta as leader of T1.2, the implementation will use a "lean software development" method, which iterates implementation rapidly with short user-feedback cycles as the pilots deploy the software. Thus implementation and actual piloting with users is 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, following a mobile first approach. 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.



In this Deliverable the following key phases of the development process are described:

Firstly, we provide a **general overview of the collaborative policy-drafting tool** that was built for the Spanish constituency that became the starting point of the development work in D5.3 and WP5. We describe the key features of the tools, their implementation and testing.

Secondly, **D-CENT Discovery, User Research and testing** is described. During December and January 2015 ThoughtWorks has led a series of workshops to identify work for upcoming prototypes in developing decentralised & privacy aware tools for democratic participation. Interactions with user groups in Spain was prioritised, with lab based testing organised by LaboDemo in Madrid with citizen activists and policy writers from Ahora Madrid citizen coalition and Podemos. Face to face interviews with policy writers and policy experts were conducted across pilot countries. At the same time, rapid prototyping and paper prototyping was carried forward in the ThoughtWorks offices. These processes were flexible, iterative and agile and we are now in the process of analysing data from the experiments and planning the next stages of iteration.

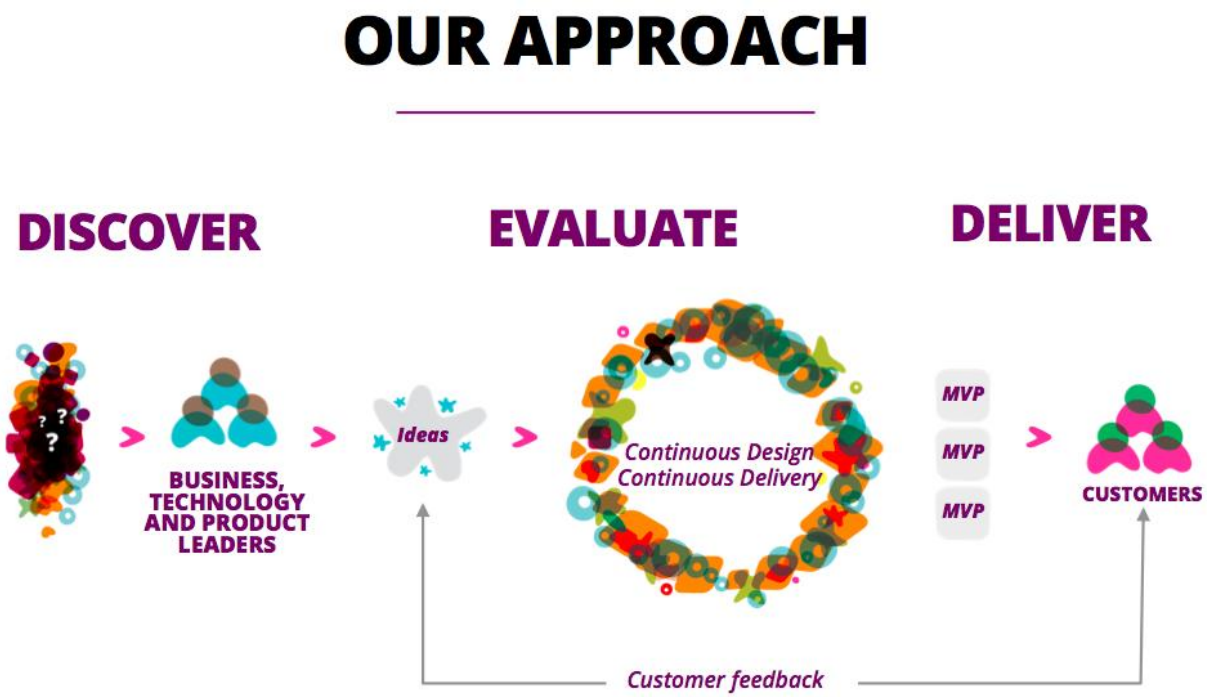
Thirdly, we decsribe the **D-CENT overall architecture Design, a modular and open-standards based platform** that is a highly cohesive and loosely coupled platform connecting the different D-CENT tools. Rather than building a monolithic platform as a single codebase, D-CENT will build several targeted tools in smaller codebases. We also outline community engagement strategy, privacy and security and standards compliance.

Finally, we will outline the piloting strategy in the targeted countries Spain, Iceland and Finland, and we propose the future Roadmap of WP5 that will be focused on running large scale pilots with communities on the ground.

D5.3 will be *the first beta implementation of a collaborative drafting tool that will be complemented with Activity stream integration and a stand-alone voting platform*.

This prototype will be a complete open policy drafting flow, where users are able to propose ideas, comment them, invite authors, collaborate on drafting a policy or a document, deliberate and vote. It will make available the various voting algorithms, proxying, signed votes, group voting, and other functions, and then will implement the open social data-store to allow it to be the append-only log of democratic decisions, i.e. the "collective memory". Here the blockchain solutions will be first tested.

At this stage, the platform will go into beta testing and communities in Finland, Iceland, and Spain will be invited to set up their own D-CENT nodes on a production server hosted by ThoughtWorks.



2. Technical description of collaborative drafting tool

2.1 Overview of the collaborative-policy making tool

The main focus of D5.3 has been to produce a tool for democratic organisations that can be used for writing policy documents (policies, manifesto pages, election promises, etc.) in an open, collaborative and transparent way. The development name of the tool is Objective8.

The tool supports the idea of collaboratively producing policy by allowing the members of a democratic community to review, comment and annotate versions (drafts) of a policy. The feedback provided by the community is then made accessible to policy writers so that it can be included in the next version of the draft.

Releasing drafts of a policy and allowing the community to shape and inform subsequent drafts is a more transparent and open method of producing policy documents than the traditional method where, in many cases, the policy document is written by a single person or small team and not shared until complete. The tool also provides features for discussing and shaping the policy idea (called objectives) and for gathering focused community input and consensus on a specific question.

In order to reach a large number of users the tool has been designed to be compatible with existing social media (e.g. Twitter, Facebook, Reddit). It is hoped that some of the features provided by these networks will be made part of the D-CENT platform.

During development and testing the most up to date version of the tool can be found here:

http://objective8.herokuapp.com/

The code is open sourced and currently hosted at this location:

https://github.com/ThoughtWorksInc/objective8

2.2 High Level Feature Overview

The work done on D5.3 to date includes 82 user stories and technical tasks. To provide a more concise overview these stories have been grouped into 'epic' stories that cover a single feature or multiple smaller features that work together to provide value to user or organisation involved in the system.

2.2.1 Creating Objectives

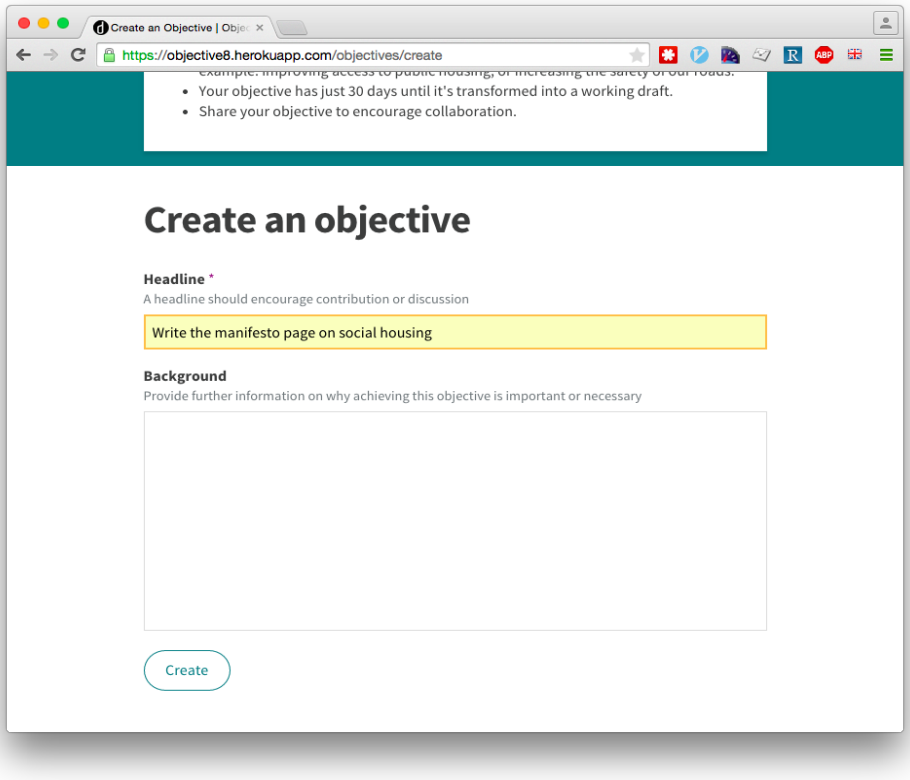
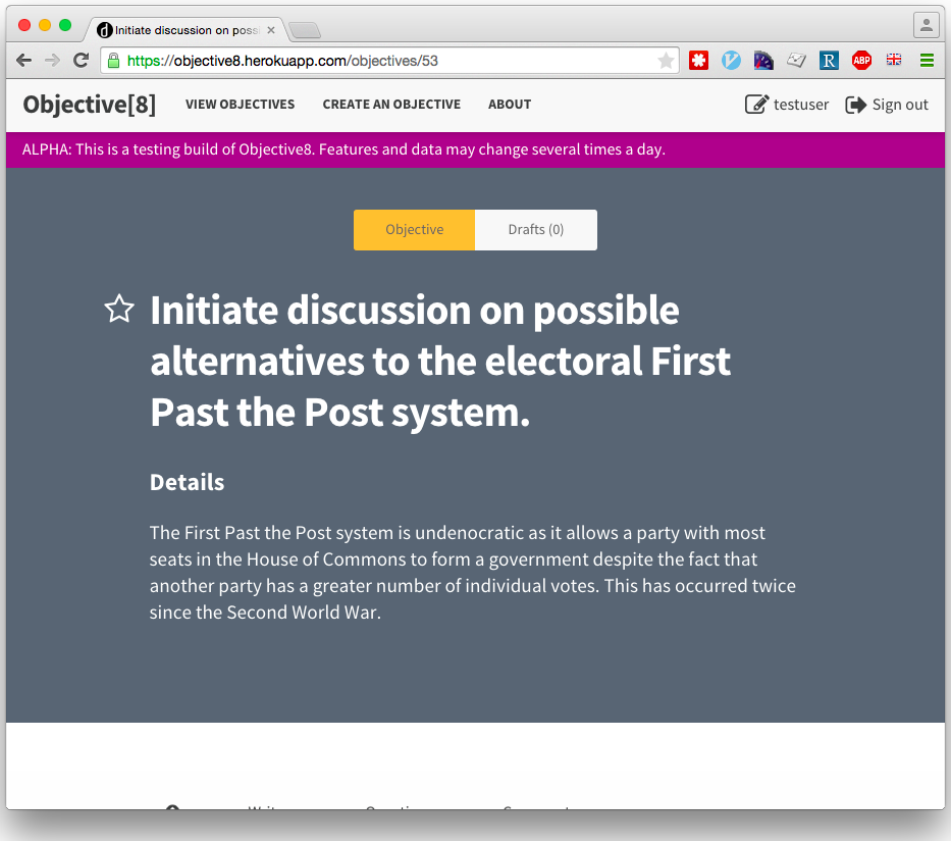
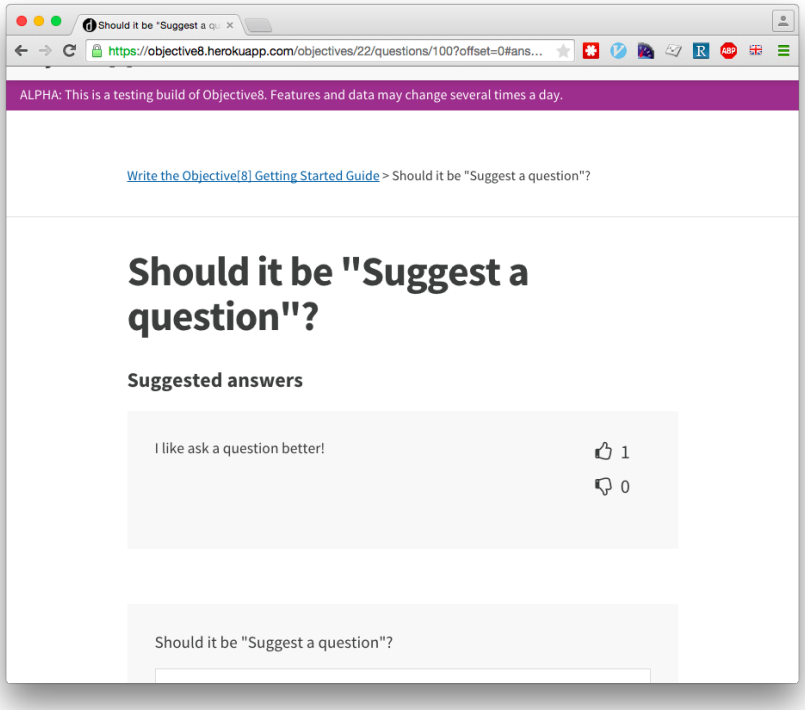
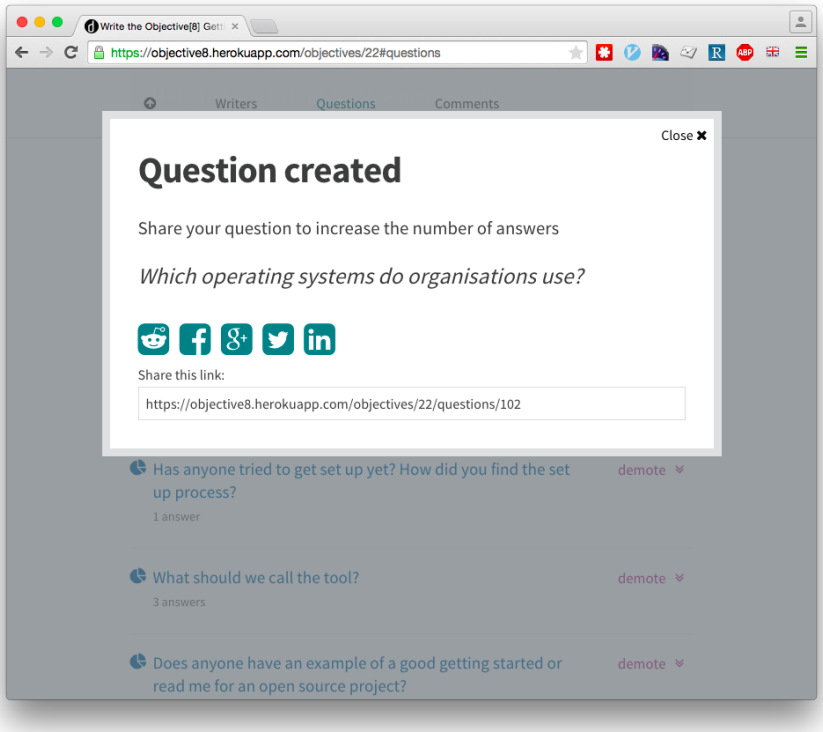
Feature	Policy ideas and objectives
Feature Definition	An objective is an area of the site that describes a policy idea for the community to collaborate on.
User story	"As a policy writer, I want a place to discuss and develop my policy idea with my community, so that the policy I write better represents the views of the community."
Description	An objective is an individual and shareable area of the site that acts as a hub for discussion, gathering opinions and discussing drafts of policy documents. The person who creates an objective becomes the first 'policy writer' and is able to invite subsequent policy writers.
Technical implementation	Objectives are created by submitting a web form to the frontend application, the frontend application then negotiates with the objective8 http-api on the users behalf and creates a new objective object. Each objective is referenced by a URI and has a unique URL which can be shared via Twitter, Facebook, Reddit and other social media.
Screenshot of Testing done	

Table 8.

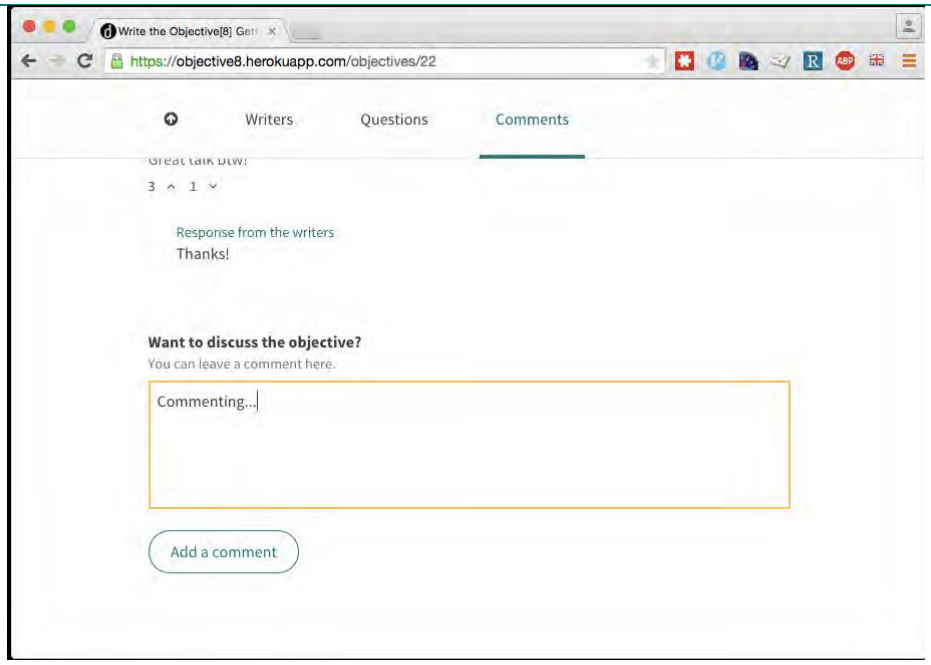
2.2.2 Questions and Answers

Feature	Questions and Answers
Feature Definition	Questions are attached to objectives in order to gather community feedback and consensus around a specific issue or point of discussion
User story	"As someone involved in the policy drafting process, I want to get feedback and consensus from the community on an issue, so that the results can be used to inform the policy drafting."
Description	Questions are attached to objectives; they are individually shareable and designed to spread via social media. Users viewing questions can add their own answers or show their agreement or disagreement with an existing answer.
Technical implementation	Questions and answers are created by submitting web forms to the frontend application that then calls out to the restful objective8 http API on the users behalf.
Screenshot of Testing done	

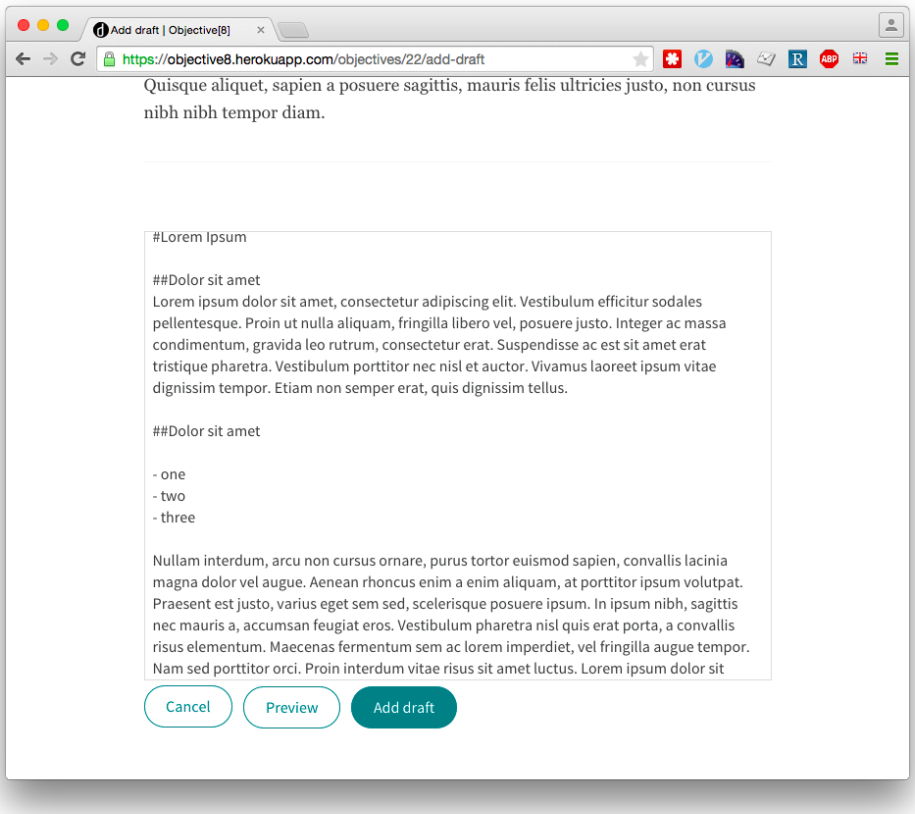

https://objective8.herokuapp.com/objectives/22/questions/100?offset=0#ans...
ALPHA: This is a testing build of Objective8. Features and data may change several times a day.
Write the Objective[8] Getting Started Guide > Should it be "Suggest a question"?
Should it be "Suggest a question"?
Suggested answers
I like ask a question better!
1
0
Should it be "Suggest a question"?

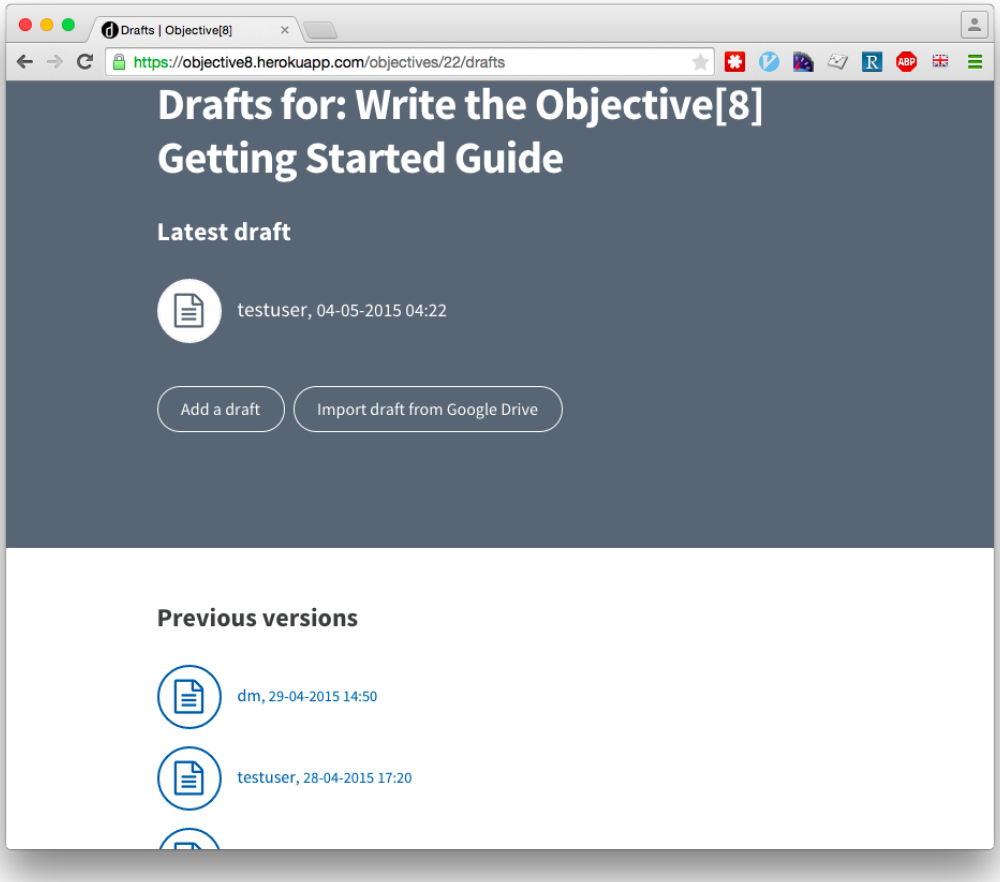

https://objective8.herokuapp.com/objectives/22#questions
Writers
Questions
Comments
Close
Question created
Share your question to increase the number of answers
Which operating systems do organisations use?
Share this link:
https://objective8.herokuapp.com/objectives/22/questions/102
Has anyone tried to get set up yet? How did you find the set up process?
1 answer
demote
What should we call the tool?
3 answers
demote
Does anyone have an example of a good getting started or read me for an open source project?
demote

2.2.3 Commenting

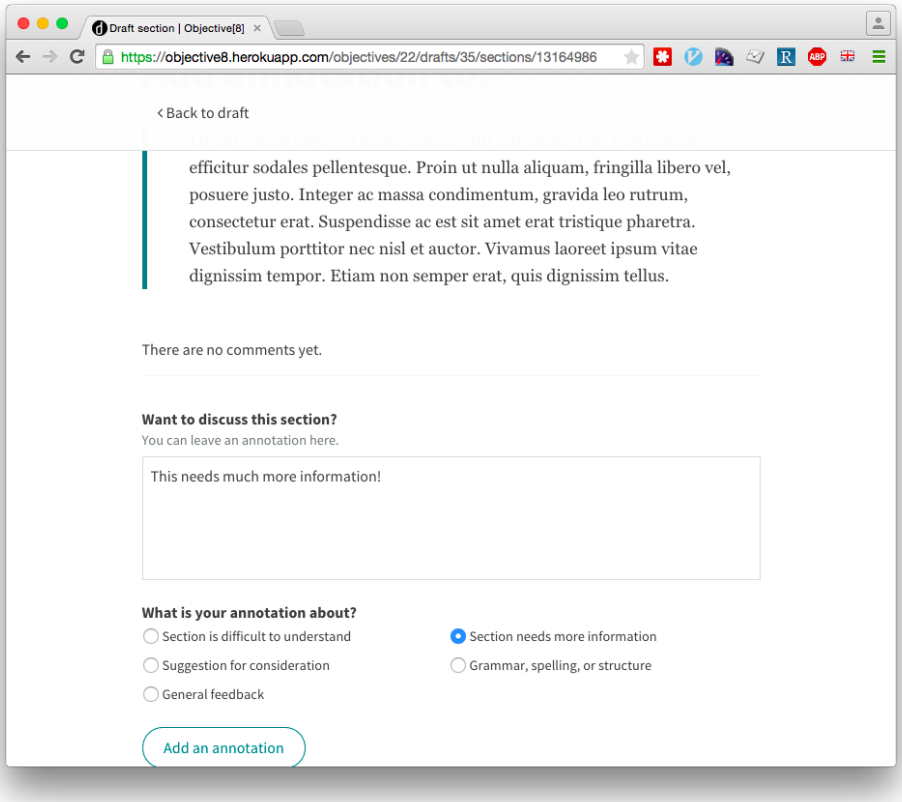
Feature	Commenting a policy objective or draft
Feature Definition	Users are able to comment on an objective and on policy drafts
User story	"As a user of the site, I want to discuss objectives and policy drafts, so that the rest of the community can see my views"
Description	Comments can be added on the objective page and on drafts of documents. This allows users to discuss the over all intent of the policy being produced and the contents of each draft at a document level. Users are also able to vote on comments using the ubiquitous 'up-vote / down-vote' model.
Technical implementation	Comments are submitted by web forms and stored as meta information against other entities in the system. This allows the commenting system to be easily extended to other items if the need arises.
Screenshot of Testing done	

2.2.4 Publishing a Draft

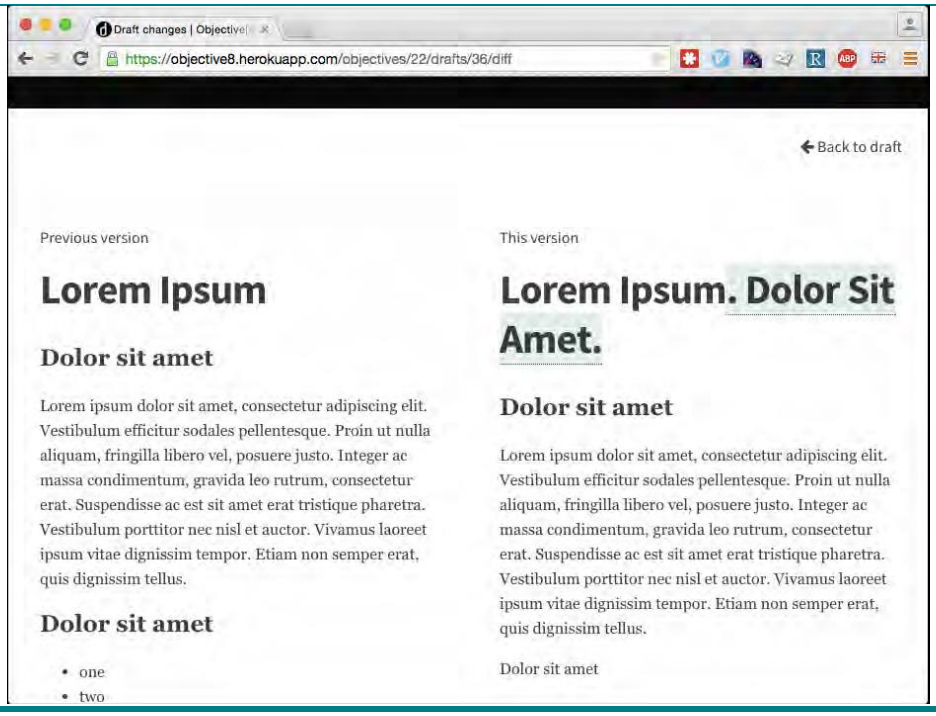
Feature	Publishing a Draft
Feature Definition	Policy documents are written as a series of drafts. Each draft is available to the community for commenting and annotating. The policy writers are then able to consume this feedback to improve the next version of the draft
User story	"As a policy writer, I want to release drafts of my policy, so that I can get feedback from the community."
Description	Policy drafts can be added to an objective by the policy writers for that objective. There are two methods of adding a draft, writing (or copy/pasting) the text into a web form or by importing the document from another tool. We have a working example of this importing using Google Docs and plan to add other tools.
Technical implementation	Drafts are stored as a subset of HTML and can be submitted as either markdown or html (imported from an existing editor). In this way drafts can be created from either plain text, markdown formatted text or rich text created in another editor. Each draft has it's own URI and URL and can be shared and bookmarked.
Screenshot of Testing done	


Drafts | Objective[8]
https://objective8.herokuapp.com/objectives/22/drafts
Drafts for: Write the Objective[8] Getting Started Guide
Latest draft
testuser, 04-05-2015 04:22
Add a draft
Import draft from Google Drive
Previous versions
dm, 29-04-2015 14:50
testuser, 28-04-2015 17:20

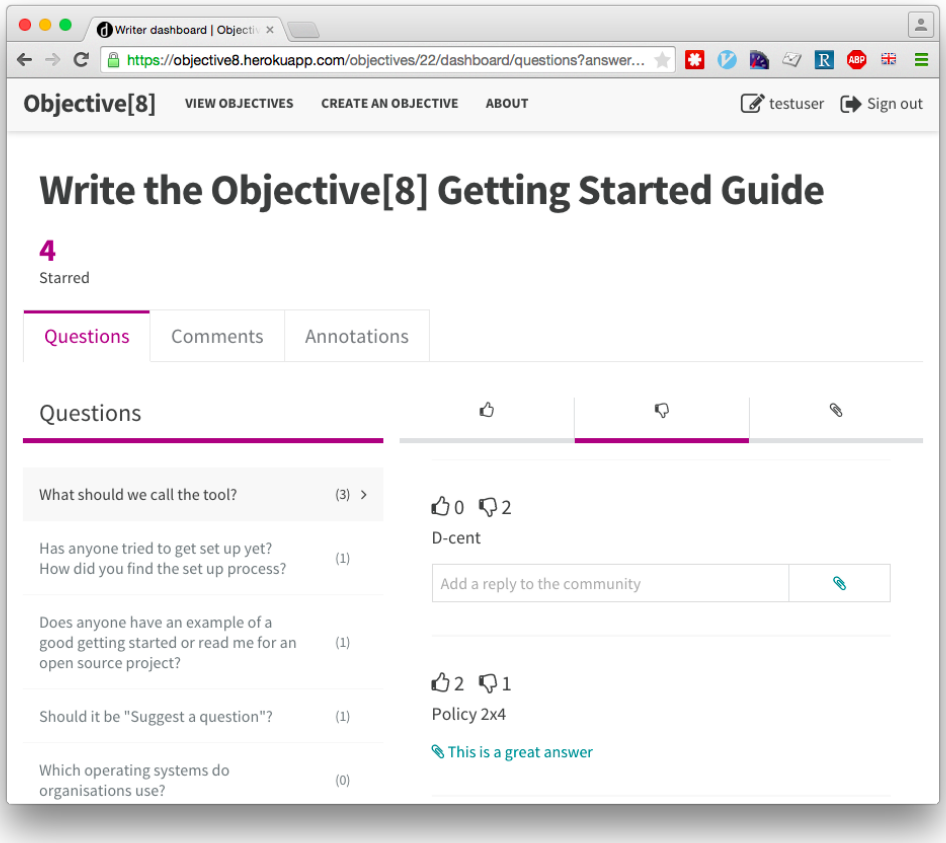
2.2.5 Annotating a Draft

Feature	Write annotations on a Draft
Feature Definition	Users are able to add annotations to policy drafts. Annotations are comments which are attached to individual sections of a document. Annotations also capture the intent of the annotation from a list of categories.
User story	"As a user reviewing a draft, I want to annotate a section of the draft with a message, so that I can draw attention to my views of a particular section."
Description	Annotations are attached to a section (e.g. title, subtitle, paragraph, list, etc.) of a policy draft. They also contain the reason for the annotation (e.g. more information is needed, there is a grammatical error, etc.). In this way it will be easy to provide cumulative statistics based on the annotation category. For instance finding a paragraph with a large number of grammatical error annotations
Technical implementation	Annotations are captured via the frontend. Policy drafts are split into sections as they are saved and annotations are stored with a reference to the section they apply to.
Screenshot of Testing done	

2.2.6 Difference Highlighting between two Policy Drafts

Feature	Track changes between Policy Drafts
Feature Definition	Users are able to view the changes (additions and deletions) between two versions of a draft
User story	"As a user viewing a new version of a policy draft, I want to be able to see the changes that were made compared to the previous version, so that I can see how the draft is evolving over time"
Description	When viewing a policy draft users are able to see the current version and the previous version side by side; in this view additions and removals to the text are highlighted.
Technical implementation	To display the differences between two drafts the software uses the diff-match-patch library and the hiccup data model in a way that has been designed to work with HTML documents while preserving their structure.
Screenshot of Testing done	

2.2.7 Writer Dashboard

Feature	Writer dashboard
Feature Definition	The writer dashboard allows policy writers to find and filter feedback from across objectives, drafts and questions.
User story	"As a policy writer, I want to be able to find the right feedback at the right time, so that I can use it in further drafts of my policy."
Description	Policy writers are able to access a dashboard attached to their objectives. The dashboard displays comments, annotations, questions and answers that are part of that objective. Writers can sort comments and annotations based on 'up-votes' by the community. Answers can be filtered based on agreement and disagreement. Writers are able to quickly reply to comments, annotations and answers from the dashboard. These replies are visible to the community.
Technical implementation	The dashboard uses data from the Objective8 API that are returned as JSON and then processed and sorted on the frontend.
Screenshot of Testing done	

3. User research & Beta testing

The development of D5.3 has been informed by feedback and workshops with members of the D-CENT consortium and various forms of user research. At this stage in the software development the data collected from user testing is qualitative and targeted at the solution design as well as the software implementation of that solution.

Quantitative data will be gathered during the piloting of the tools in user communities. This data will be more targeted at improving the implementation and user experience of the solution.

3.1 Project Quick Start in January

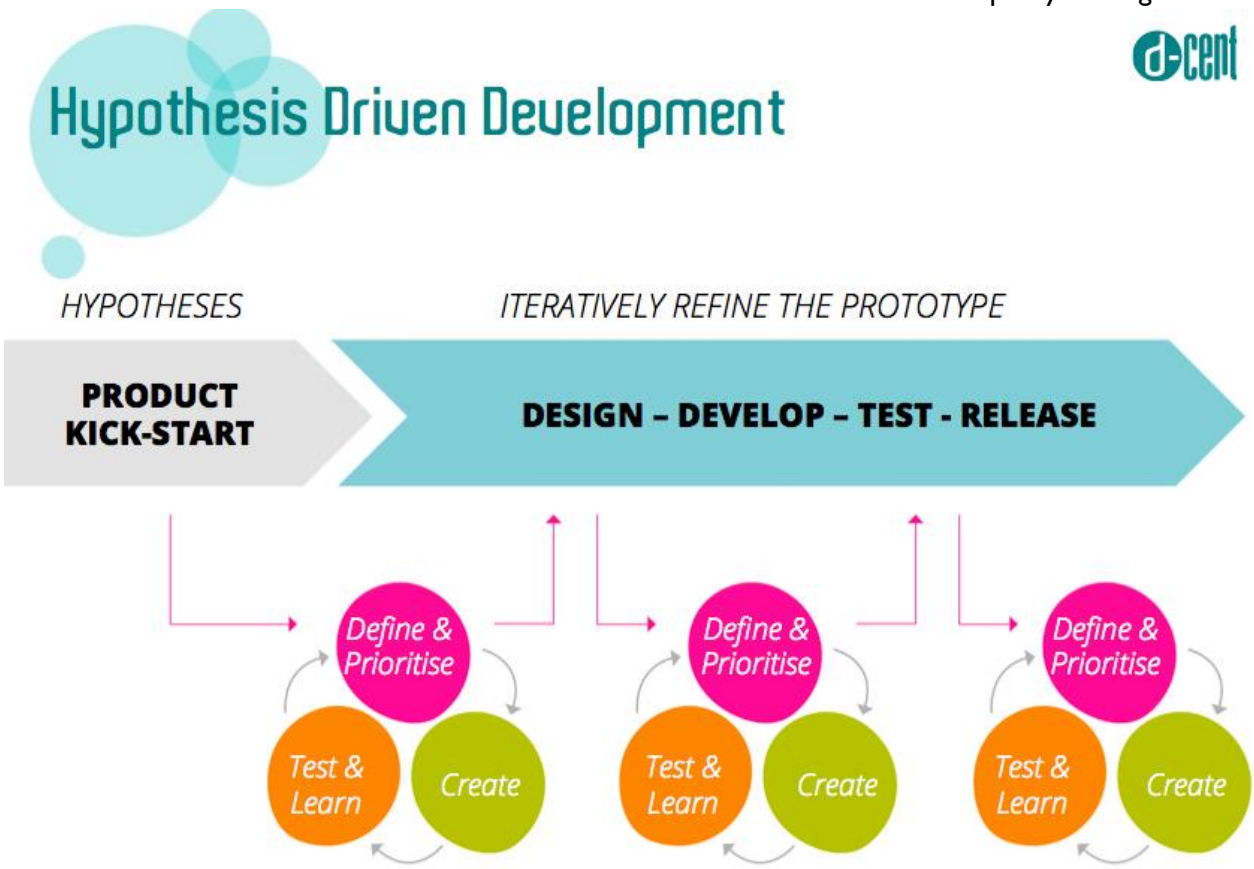
After the D-CENT discovery sessions with the entire Consortium led by ThoughtWorks in December, members of ThoughtWorks and LaboDemo worked together in January 2015 to define the initial design for the collaborative policy-making tool developed as part of D5.3. Using lean design principles a problem area, product description and lightweight solution design were proposed. Hypothesise and assumptions captured during the workshop formed the basis of the first rounds of lab based user testing.

Directed User Research

- Lab sessions with representative users
- Users attempt to complete set goals
- Feedback is collected based on how well they are able to use the tools

Ongoing feedback & data collection

- Tools instrumented to collect web analytics providing feedback on how users spend their time in the tool
- Interviews with users to collect their qualitative experiences after time using the tool unsupported



3.2 Lab Based User Testing

LaboDemo organised lab based user testing in Madrid at three-week intervals during early development of the software. ThoughtWorks provided support and an on site user researcher to run the first sessions. Later the user research was handed over to LaboDemo.

In these tests, users interacted with early versions of the software and with prototypes. The goal was to test initial reactions to the tool and to the concept of collaborating on a piece of policy.

The lab testing allowed us to identify early usability problems with both the software and the proposed solution and adapt to fix them. For instance in early versions of the software users had to define goals for their policy to achieve. In testing people had problems identifying these goals or included them in the objective description. As a result the need to capture 'goal' data for objectives was removed.

LaboDemo work inside the D-CENT project started with a description of the political situation in Spain at all levels (from citizens to parties through social movements), and the main needs and barriers identified in this situation. This information was worked on in an inception workshop organized in December where it was decided to prioritize the work to solve the need of a collaborative policy making tool. This need was especially patent during the definition of the new political party Podemos, through the process of the collaborative program for the European Elections, and through the Citizen General Assembly held in October, where the statutes of the

party were proposed and voted. Both processes, open to citizen collaboration, failed [***] and did not produced policy built collaboratively by the people, with the basic requirements of such a process: open, democratic, representative, collective intelligence, etc.

Once the main object to work on was defined, there was a kick-off workshop on January to start building the tool, were we proposed a design of a tool able to accomplish the previous requirements, using our experience of the processes being held, and the successes and failures of the tools used in the political processes of the last years.

The design of the tool was split in four phases: writers/experts selection, debate, policy drafting, review and comments on the draft. And different features were planned for each phase according with the previous experience commented.

Some of the main key ideas proposed for the design were [***]:

- Modularity. Any concrete processes could be developed going through different phases or degrees of complexity, depending on the specific issue that is addressed and its needs.

- Different roles of users. In each processes, different kind of users will be involved and interact in a different way. As a starting point there are creators of the objectives, writers/experts and regular citizens.

- Filtering and selection mechanisms. This is the crucial part of the tool, since it will be used in processes with large scale participation, and thus having mechanisms to filter and select the best information will be the key point to produce the main requirements commented before (open, democratic, etc.). Existing successful tools were proposed to replicate their methods of filtering and selection. In particular three tools were suggested: reddit, appgree and allourideas. This tools or their methods are being used through all the political movements in Spain: Plaza Podemos (http://plaza.podemos.info) and the collaborative program made in Madrid (http://programa.ahoramadrid.) and Zaragoza (http://programa.) are using reddit or equivalent systems; Appgree has been used by creating channels all around the country; the collaborative program of Ganemos Sevilla (http://participa.) or Proyecto Impulsa in Podemos (http://podemos.info/impulsa) has been done using an equivalent system to allourideas.

- Scaling mechanisms. Another mechanisms to be able to scale where proposed. Specially regarding the comments structure of the debates, and the comments made to the drafts in specific paragraphs, for which a system similar as the one of Co-ment was suggested (as the ones used inside Ahora Madrid https://lite.co-ment.com/text/), but with improvements to let it scale to any number of participants.

- Other improvements. Different suggestions were made to improve the processes, as a different interface to let the users compare different versions of the draft easily, the transparency, democracy and accountability of the whole process, etc.

After the kick-off workshop ThoughtWorks started building the tool, and LaboDemo was in charge of organizing regular tests of the tool, used by the developers in their Agile/Lean development methodology. The majority of the tests were done in a space arranged in the Medialab-Prado building in Madrid, and some of them through videoconference. Different profiles of users were searched for the tests: men and women, with different expertise on technology and internet, with different ages, etc. Also people involved inside the current political processes, especially regarding policy drafting, were contacted, to test the part of the tool that has to do with the writers/experts and the creators of the objectives.

After the tests, LaboDemo also provided informs with problems found in the tool and suggestions to improve it; and also helped translating the tool to Spanish.

Outputs for these tests attached. Appendix I

3.3 Interviews with Policy Writers

Existing policy writers and other subject matter experts were interviewed via video call and on sight in Barcelona. The purpose of these interviews was to understand the existing policy writing process inside of political organisations; gather writers initial thoughts on the proposed process of releasing policy drafts and to work out what 'good' community generated content would look like.

3.4 Rapid paper based prototyping

In order to find the categories for the annotations feature a short piece of paper prototyping was undertaken where volunteers were asked to annotate existing, anonymous pages from political manifestos with the goal of 'help the author improve this document'. The participants were provided with print outs of the documents and various pens, highlighters and sticky notes. After a period of ten minutes of annotating the participants were interviewed about their annotations and the intent behind them.

Outputs for these tests attached. Appendix II

WHO

Labo Demo did a great job inviting a range of users.

3.5 Collaborative policy-making Pilot in Spain

As we are following a lean and agile approach to software delivery it is important that working software is put in front of users (both organisations and participants) in real world situations. Feedback and analytics from these real world situations will inform further scope for the development and allow the tools to be tailored to best meet the needs of the users.

For the piloting of Objective8 there are two broad categories of users: organisational users and participants. Organisational users are policy writers, community managers and people elected to positions representing that party. These people drive the existing offline and online policy writing processes within democratic organisations. Participants are members of the party or the wider public; these are the people who we hope will be more widely involved in the policy writing process through using the tool.

To begin the piloting we will work with the partners in the pilot countries to find organisational users (policy writers) who are willing to draft a new policy document (or improve an existing policy document) using Objective8.

In return for early adoption of the tool we will provide hosting, support and coaching in how to use the tool. We will also work to rapidly turn feedback into new or improved features and to provide ad hoc data analysis for use in the finished policy document.

After we have completed the process of producing a single policy document with the tool and incorporated the feedback from this process we will begin wider piloting. In this case the tool can be made available to entire organisations or communities.

Large scale usage will be achieved when policy writers are able to incorporate the feedback from large numbers of participants into a policy document.

4. D-CENT Architecture Design

4.1 D-CENT Platform design

The general D-CENT platform should, using the lean methodology, build from the lightweight pilot D-CENT Architecture Design.

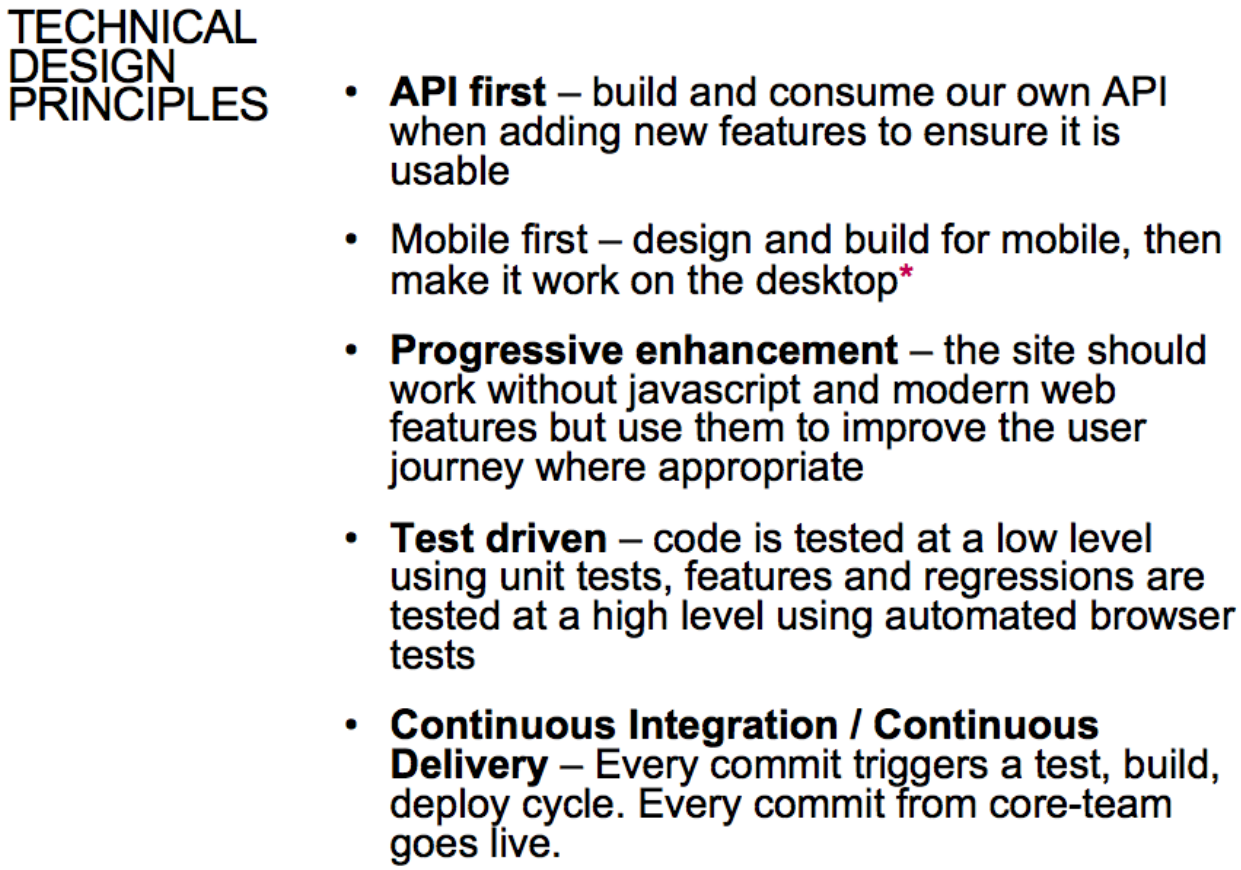
The overall vision for D-CENT is a collection of tools which, when used together, present a highly cohesive and loosely coupled platform. Each tool should solve a specific problem or provide a specific capability to an individual or organisation. An organisation choosing to use all of the tools will be able to offer a complete social networking like experience to their members, fulfilling the role that Twitter and Facebook already play in this space, but being decentralized, open standards and privacy-aware.

An organisation choosing to use some of the tools will still be able to offer the core capabilities those tools provide. This means that in some cases tools should still work with existing social capabilities already on the Internet.

The tools should integrate using HTTP(s) and JSON in a restful manner. This is where communication and transfer of data is based around the concept of resources that are accessed using commonly understood semantics. These are open and widely understood standards and will allow the platform to be extended to include other tools from the wider Internet.

Rather than building a monolithic platform as a single codebase, D-CENT will build several targeted tools in smaller codebases. Code reuse can be achieved by promoting commonly used functionality back into the ecosystem of the language. For instance publishing jars in java.

For authentication we have initially decided to use Twitter's sign on, this is so that we are supporting the OAuth 2.0 standard early. In later iterations we will add more OAuth Providers as well as exploring how the D-CENT platform can take on the roll of an identity provider for users who do not wish to user user centralised social networks when engaging in online democracy.



4.2 Languages and Frameworks

The D-CENT tools and codebases should favour integration at a web-API level. This means that different languages can be used across different code bases if desirable.

In the case of Objective8 the team is using Clojure (http://clojure.org). Clojure is a language that runs on the JVM (Java Virtual Machine) and so can be deployed and operated across a wide range of hosting options. Clojure has been chosen because its functional approach allows for rapid development. The language is also cross compatible with java allowing many existing and mature libraries to be used during development. Clojure is also a reasonably new 'up and coming' language with many developers looking for opportunities to learn and practice the language. This will be an advantage when looking for open source contributors.

4.3 Community Engagement

The code is currently being developed in the open but not actively promoted by the team as being available. We plan to promote the tools to the open source community once they reach the piloting stage of development. Until that point we will keep the development team small and localised in order to be able to make changes in response to user feedback as rapidly as possible. Finishing the piloting of the tools will allow us to be secure enough in their direction and value proposition to begin on boarding open source contributors.

4.4 Security and Privacy

The Objective8 tool currently uses Twitter as an authentication mechanism. In later deliverables we plan to allow organisations to offer their members a 'log in with your organisation' capability. A long-term goal of the platform should be to encourage organisations to take responsibility for the hosting of their users data in preference to using centralised platforms such as Facebook. Another long-term goal in this area is the federation of organisations, allowing sign in to the D-CENT tools of one organisation with the membership of a second organisation where trust has been pre-agreed.

The API for objective8 is secured using barer-tokens. This method works for small numbers of citizens but will need to be changed to an OAuth or similar based approach in the near future.

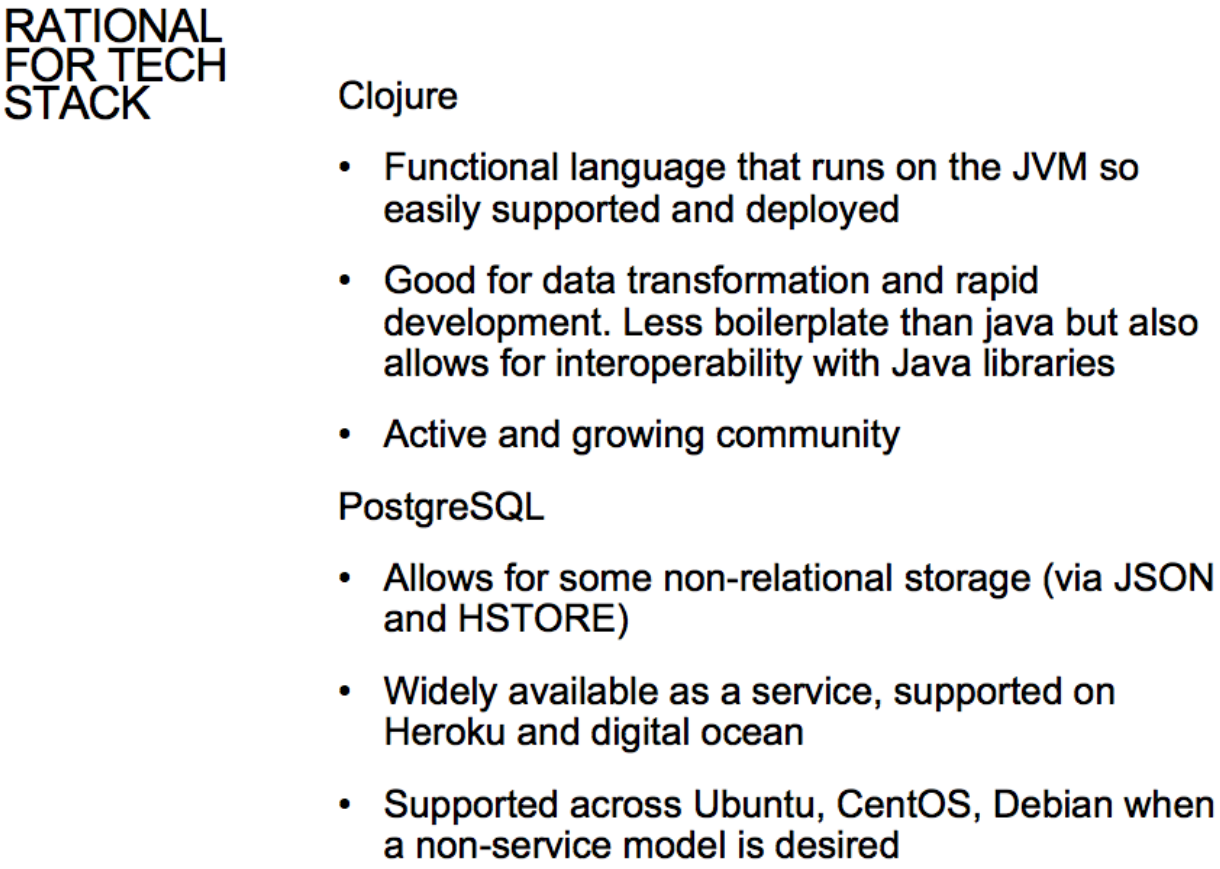
Anonymous usage was considered for Objective8 but many users felt that they wanted to know who people were during testing. In response to this we have adapted the system so that only policy writers need to have profiles.

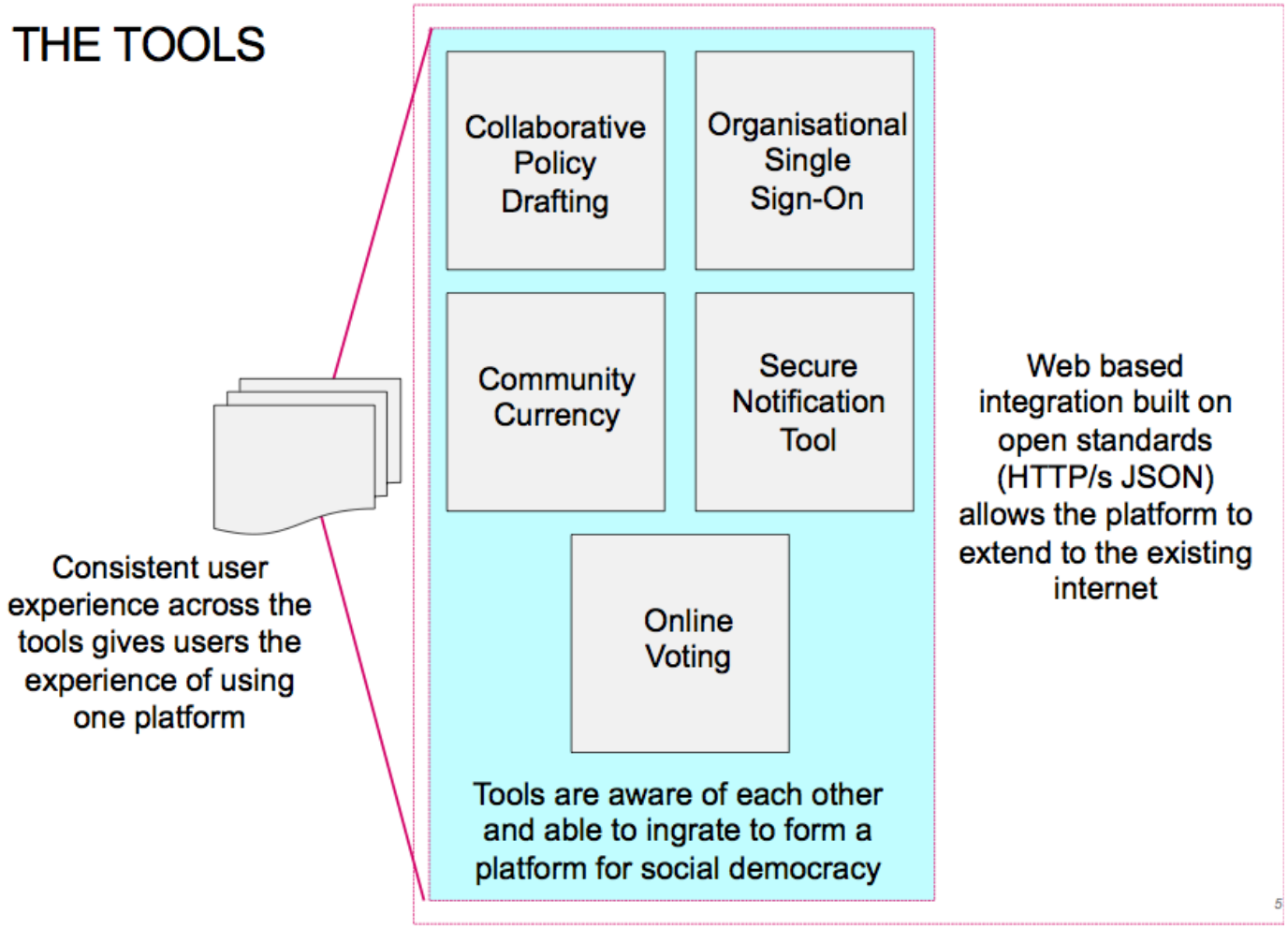
To address security concerns each tool and codebase should follow existing good practice security guides closely. At a bare minimum the OWASP top ten guides should be reviewed and followed. (See: https://www.owasp.org/index.php/OWASP_Top_10_Privacy_Risks_Project)

4.5 Standards Compliance

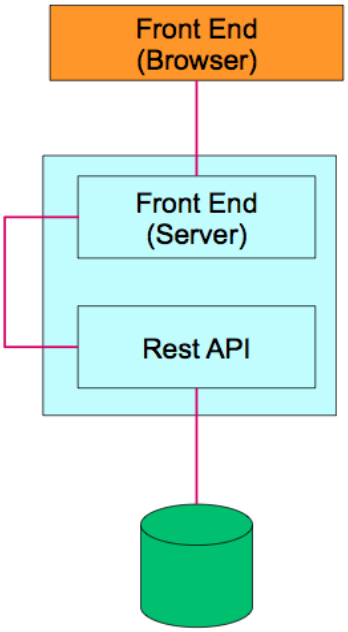
Support for standards (see D4.1; D6.3) is generally poor amongst all codebases. From the perspective of social networking, there is some support of the OStatus stack, but the stack itself is rather dated and in need of overhauling or rewriting in the W3C, which is likely to be influenced by the more lightweight IndieWeb work. However, for social messaging there is strong support in general of ActivityStreams, although no codebases yet support the ActivityStreams 2.0 standard that would work with Linked Data. This is important, as many of the APIs such as CitySDK use Linked Data and JSON, and so modifications are likely to be made to Pump.io's JSON libraries to upgrade them to the new version of ActivityStreams. Also, almost all of the social-networking and digital democracy code-bases have very poor authentication and authorization components, and very little

in the way of actual personal and social data portability via vCard. Luckily, open-source Ruby libraries such as OmniAuth for authorization (http://intridea.github.io/omniauth/) and authentication exist for most of this that can easily be added to the D-CENT platform, with later developments around the W3C Crypto API and national-level eID schemes being exploited as they mature. Diaspora features hCard support for exporting vCards for personal data, but some work may need to be done in-order to fully modernize it with the latest versions of vCard and exporting social graphs. One open question is how the social graph itself should be structured in the D-CENT platform, but a social graph server using a graph-based database such as Neo4J (http://www.neo4j.org/) may be route if appropriate vCard modifications for export and import of personal data do not easily fit within the Redis/PostgreSQL stack. In general, we expect the standardization component of the D-CENT platform to be developed in tandem with the W3C Social Web Working Group (http://www.w3.org/2013/socialweb/social-wg-charter.html) as detailed in D6.3.




THE TOOLS
Collaborative Policy Drafting
Organisational Single Sign-On
Community Currency
Secure Notification Tool
Online Voting
Tools are aware of each other and able to ingrate to form a platform for social democracy
Consistent user experience across the tools gives users the experience of using one platform
Web based integration built on open standards (HTTP/s JSON) allows the platform to extend to the existing internet
5

TECH STACK



- HTML
- Form Posts
- Minimal Javascript

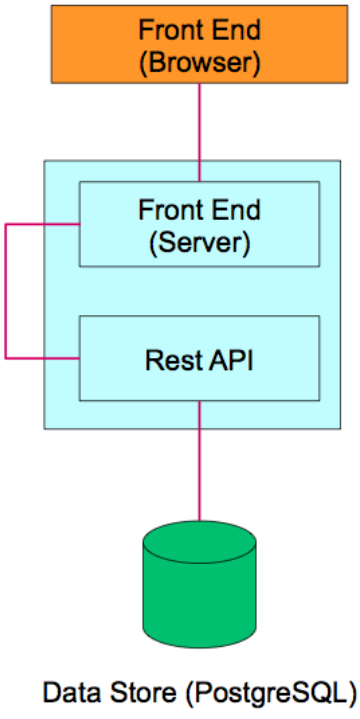
- Clojure based webapp using HTTPKIT as a server
- Runs on the JVM
- Currently deployed on Heroku (later Ubuntu LTS 14.04) but should work anywhere the JVM does

- PostgreSQL using JSON extensions
- Works using Postgres as a service or as a stand alone deployment

Pre-compiled Assets

- Node.js based asset pipeline
- Jade, Node-Sass, Uglify

ARCHITECTURE OVERVIEW



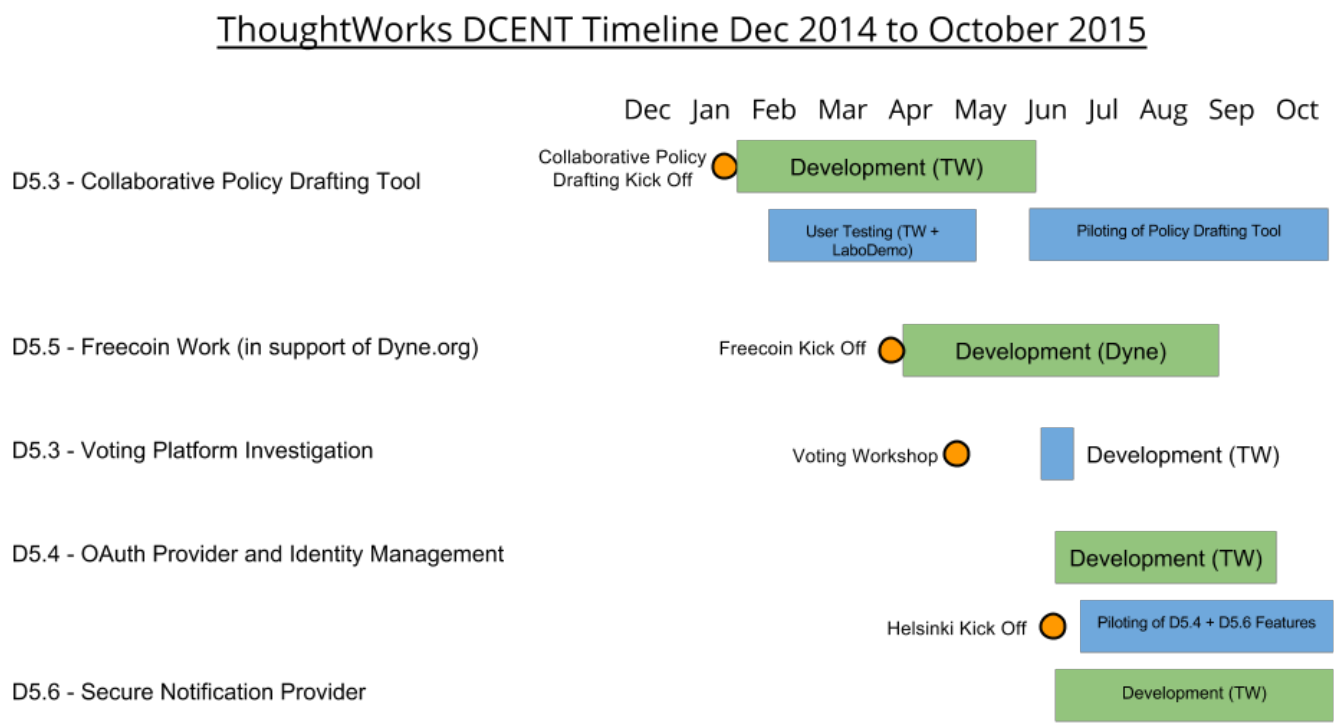
- Minimal JavaScript,
- Form-post based communication with server

- Front End and API currently sit in same process
- Built to separated later (no direct communication between front end and API)
- Restful API (get, put, post)
- Authentication currently uses bearer tokens
- Relational Data Model
- Using JSON extensions for 'document' shaped data
- All interaction with database via the API

Pre-compiled Assets

- HTML, javascript and CSS generated as static site for 'in-browser' design
- HTML based DSL for translations (uses data-attributes)
- 'Logicless templating' approach

5. Conclusions and Future Roadmap



This timeline represents the current understanding of the work for DCENT. This timeline may change as we discover more about the work and the user value that can be achieved for citizens and participants.

29th May 2015

5.1 Next Steps

Going forward ThoughtWorks, as technology partner, plan to achieve the deliverables by working with the pilot partners to identify needs in their countries and communities (e.g. the need for notifications based on a stream of municipal decisions in Helsinki). Software will be built to fulfill these needs using agile and lean methodologies and, where appropriate, the standards and recommendations set out in previous D-CENT research.

As a general pattern for building the tools which make up the D-CENT platform ThoughtWorks recommend putting end to end software into production in a real world situation as quickly as possible and then iterating that software based on feedback from users in the piloting countries to ensure it meets their needs.

In order to reach the level of participation required for large scale piloting it is important that the features and requirements set out in the deliverables are validated and prioritised according to the value they provide to participating citizens; reported or demonstrated by feedback from those citizens using the tool in real world situations.

The development of the software will be guided by the technical design principles and open standards to ensure that the tools developed will be easily deployable and extensible beyond the countries they are tested and piloted in. We will stick to the heuristic of 'loosely coupled and highly cohesive' tools to ensure that software produced for D-CENT is compatible with the wider Internet.

Beyond October 2015 the focus will be on iterating tools that are already in piloting in response to feedback about the user value they provide citizens. Work will also be carried out on the deliverables for documentation and for ensuring the ease of use of the code codebases for open source developers. The ability for federation and cross platform integration will be assessed for D-CENT during this time.

5.2 Large Scale Piloting in Spain, Finland and Iceland

As D-CENT is following a lean approach and no single suitable codebase could be found, the lean approach will develop three pilots that then, over time and in D4.3 and D5.1, mature into the D-CENT platform. The technical requirements that come from the social requirements should then be tested in the pilots. This will determine what parts of various codebases reviewed here are useful for the future of the D-CENT project as well as whether or not the technical requirements adequately represent the social requirements as discovered in D1.2.

As we are working with the" Lean" method we have selected Minimum Viable Products to test in each of the pilot countries. Below are technical requirements for the first lean Active Experiments in all three pilot countries that will then be scaled to reach more users across Europe.

As technology partner ThoughtWorks will facilitate the conditions for the large-scale piloting of the tools by providing the following:

Hosting	Providing infrastructure and deployment capability in order for the applications to be available and rapidly updated / iterated.
Analytics	Providing qualitative analytics based on usage of the tools in the pilot countries.
Support for user testing & Research	Support with user-testing sessions and synthesis of the outputs into changes to the software.
Iteration & updating of Tools	On-going development of the tools to add or improve features based on user feedback
Ad hoc support of users	Providing access to 'one-off' data and features to support users in achieving their goals (e.g. producing policy documents).

The consortium partners will need to provide

Identify user groups	The D-CENT partners in Spain (Podemos, Barcelona en comù and Ahora Madrid); Helsinki (Open Ministry and Helsinki City Council) and Iceland (Your Priorities) will be in charge to find users locally wiling to use the tools during beta testing and piloting
Translation of the tools and feedback	The tools should be presented to users in their native languages. Internationalisation has been considered as a cross function requirement and the capability exists within the D-CENT tools. The translation of the tools to the language and idioms of the pilot groups should be performed by the consortium partners for the pilot group.