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# D3.4: P2Pvalue platform v1.0

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## P2Pvalue Consortium



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## Project objectives

- **Development of a software platform**
  - Understand, experiment with, design and build a collective intelligence techno-social federated collaborative platform that will foster the sustainability of communities of collaborative production.
  - Deploy several customised nodes of the federated platform in which real-world communities will interact, participate, and collaboratively create content.
  
- **Theory and Policy**
  - Develop CBPP theory, based on multidisciplinary and multi-method research on CBPP, and determine the factors for success, productivity, and resilience in communities (“best practices”).
  - Develop a set of value metrics and reward mechanisms that incentivise the participation of citizens in CBPP.
  - Simulate the new sustainability models proposed, showing how robust they are in the face of diverse community conditions.
  - Verify the compatibility of the proposed models with innovation policies and provide a series of policy recommendations for public administrations to encourage CBPP-driven social innovation.
  
- **Data and Resources**
  - Provide a directory of existing CBPP communities, together with their main characteristics.

Maintain an open web-based CBPP archive, with the collected data-sets, surveys, reports, Open Educational Resources and open-access publications, freely available to other researchers and third-parties under an open copyleft license. This includes a project public repository with all code available as free/open source.

## Executive Summary

After three years of research, exploration and development, P2Pvalue has produced two large software outcomes: Teem, a web and mobile app to increase participation in Commons-based Peer Production (CBPP) communities, and SwellRT, the first backend framework to build decentralized real-time collaborative apps.

In CBPP communities, there is an “invisible wall” between those actively contributing (core members and occasional contributors) and those who do not, which are the majority of the community (the users or audience, but also potential contributors). Teem main aim is to reduce such invisible wall height, making communities more inclusive and facilitate their growth and sustainability.

Teem is the last evolution of the participatory Lean development process that P2Pvalue has followed. Nowadays, Teem provides a visual way for community groups to get people involved, while enabling a collaborative workspace. The app uses state-of-the-art technology which allows it to be (1) decentralized, (2) real-time, and (3) extensible.

SwellRT has evolved further this 3rd year, and has been established as an independent robust product, with a special effort on facilitating the developer’s work. Nowadays, it is a developer-friendly platform that facilitates the creation of modern real-time collaborative applications, which are decentralized and interoperable using modern protocols. An indicator of SwellRT’s success is that the actual Apache Wave project has asked us to adopt the SwellRT codebase, discarding their own codebase (final official vote to be held on Sept 28th).

The most remarkable features developed this 3rd year are a new API for JavaScript integration, support of widgets and annotations, web editor presence, renovated federation infrastructure and several documentation and communication efforts.

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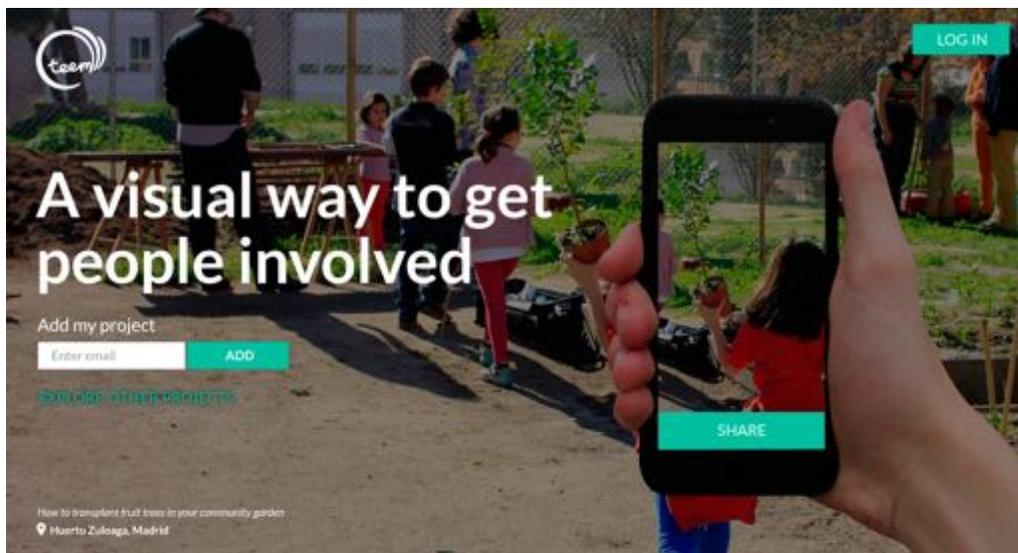
# 1. Teem: A visual way for community groups to get people involved.

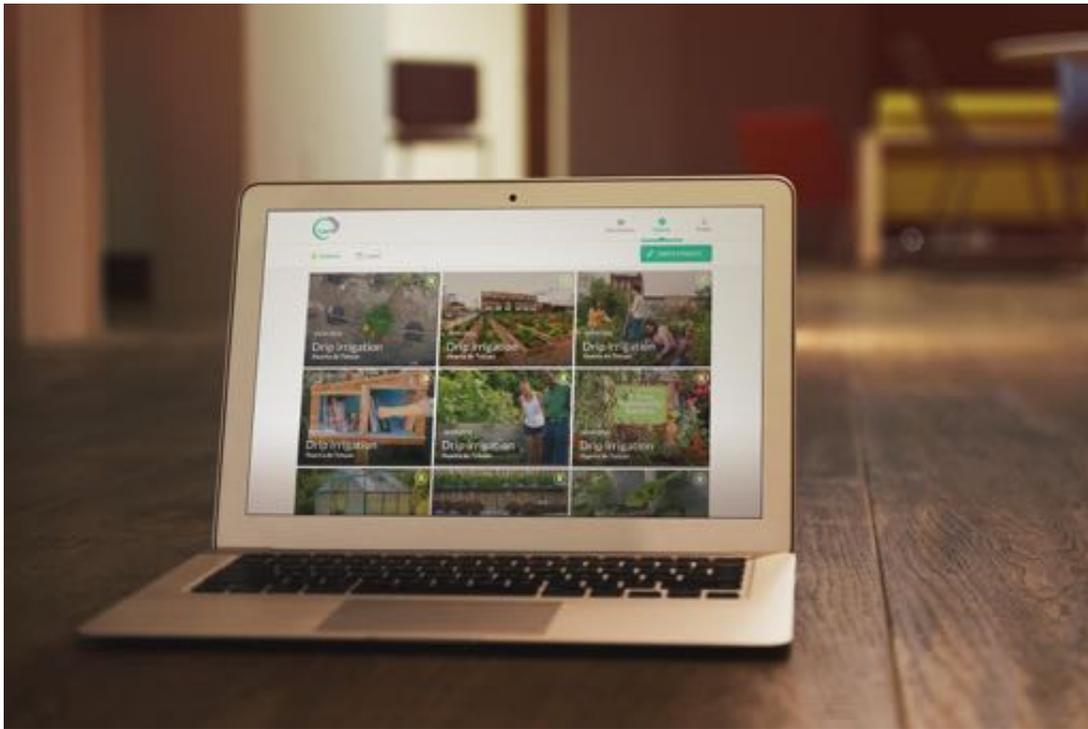
## Introduction

After three years of research, exploration and development, P2Pvalue has produced two large software outcomes: SwellIRT, the first backend framework to build decentralized real-time collaborative apps, and Teem, a web and mobile app to increase participation in Commons-based Peer Production (CBPP) communities. This section will explain the final evolution of Teem while the next section will cover SwellIRT's progress.

The app named "Teem" is the final stage of the process of participatory research through Lean UX and Design Thinking methodologies, as exposed in previous deliverables D3.2 and D3.3 methodological chapters. After exploring and developing multiple prototypes, by the end of the 2nd year we converged into the "crowd-doing" concept (D3.3). This idea was further refined during this 3rd year, adding functionalities and building a stable and robust app that aims to (1) facilitate participation in CBPP communities, (2) serve as a complete example of the capabilities of SwellIRT decentralized collaborative technology.

The concept of Teem is now summarised as "a visual way for community groups to get people involved", after it has keep evolving based on the insights from the experimentation with CBPP communities. Instead of getting into the technical details like in D3.3, this section depicts what is Teem, and how it helps communities to attract collaboration to smooth the participation in communities and boost their sustainability.





## The vision and value proposition

Collaborative communities and peer production are innovative fast-growing models of production. However they suffer from sustainability and inclusiveness problems, because they heavily depend on a few members that carry out most of the work. The distribution of effort in these communities usually follows a power law distribution (the 1-9-90 rule)<sup>1</sup>. We have used this distribution to characterize the user segments of our tool<sup>2</sup>:

- The 1%, or core members, which push forward the community;
- The 9%, or are occasional contributors, with more irregular participation;
- And the 90%, or the users/readers, which do not directly contribute but may share, rate, tweet or discuss the co-created resources.

<sup>1</sup> Nielsen, Jakob (2006) "The 90-9-1 Rule for Participation Inequality in Social Media and Online Communities". <http://www.nngroup.com/articles/participation-inequality/>

<sup>2</sup>Deliverable 3.3, Platform Design Chapter

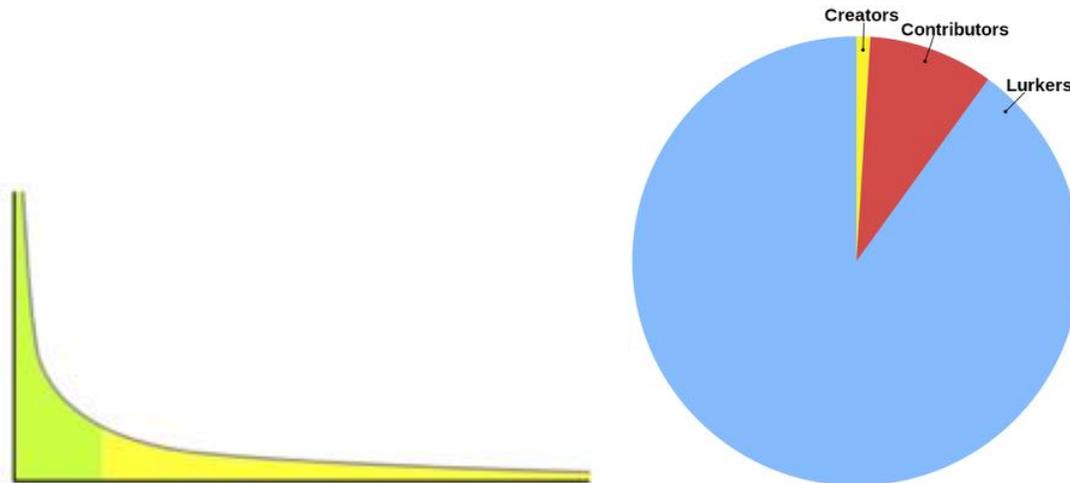


Figure 1: Graphs showing the Power Law distribution of effort and 1-9-90 rule.

CBPP communities heavily depend on volunteers. However, there is an “invisible wall” between those actively contributing (core members and occasional contributors) and those who do not, which are the majority of the community (the users or audience, but also potential contributors). If we could reduce such wall, it would facilitate participation and onboarding of new members, that is, some “90s” would become “9s”. Moreover, we could use facilitate 9s to become 1s by taking the lead in initiatives. This way, the power law distribution of effort would be smoothed. Hopefully, such outcome would have multiple positive results in communities: reduce the common feelings of frustration and guilt of core members and occasional contributors, reduce the strong dependency on the core members (which may endanger the community sustainability), and help to distribute the workload.



Figure 2: Power Law distribution and a more equally distributed workload.

The current version of Teem is an application built precisely with these aims in mind, especially focusing on **reducing the “invisible wall” height, making CBPP communities more inclusive and facilitate their growth and sustainability**. The next subsections describe the tool and how its design and approach help communities to solve these issues.

## 1. A visual way to decrease the Invisible Wall.

Therefore, Teem aims to increase collaboration in CBPP communities by reducing the invisible wall between those contributing (core members and occasional collaborators) and those not (users or readers). After multiple experimentation with CBPP communities, we have developed a visual way to do that, i.e. facilitating the sharing of community projects through a visual interaction. Project organizers can make images of projects in their communities, in order to share them with new people who could join the effort. Communities have a common workspace with collaboration tools such as a collaborative editor (like Google Docs or EtherPad) and a chat, where projects can list those tasks that need a helping hand to engage new people. Teem is available both as a web<sup>3</sup> and a mobile<sup>4</sup> application. Some interactions, such as easy sharing through photos or getting notification updates, fit better in an app for mobile devices while others like fast collaboration in text documents are easier with desktop devices. The following subsections explain in detail the main features of the tool.

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<sup>3</sup> Teem web application. <https://teem.works>

<sup>4</sup> Teem mobile application in Google Play. <http://tiny.cc/teemapp>

### *Sharing projects in a visual way*

We have observed in multiple experiments that sharing information to facilitate the collaboration of new members is something really difficult. Some of the last prototype refinements have tried to build an interface to facilitate this communication among active members and members willing to start participating. Our last iteration aims to target this problem by helping community organizers to share their community projects in a visual way. By taking or uploading a picture of their activities, they can add their projects to the app ecosystem. In the gallery of projects that the app provides (Figure 3), users looking for interesting projects to participate can discover, learn and join those projects.

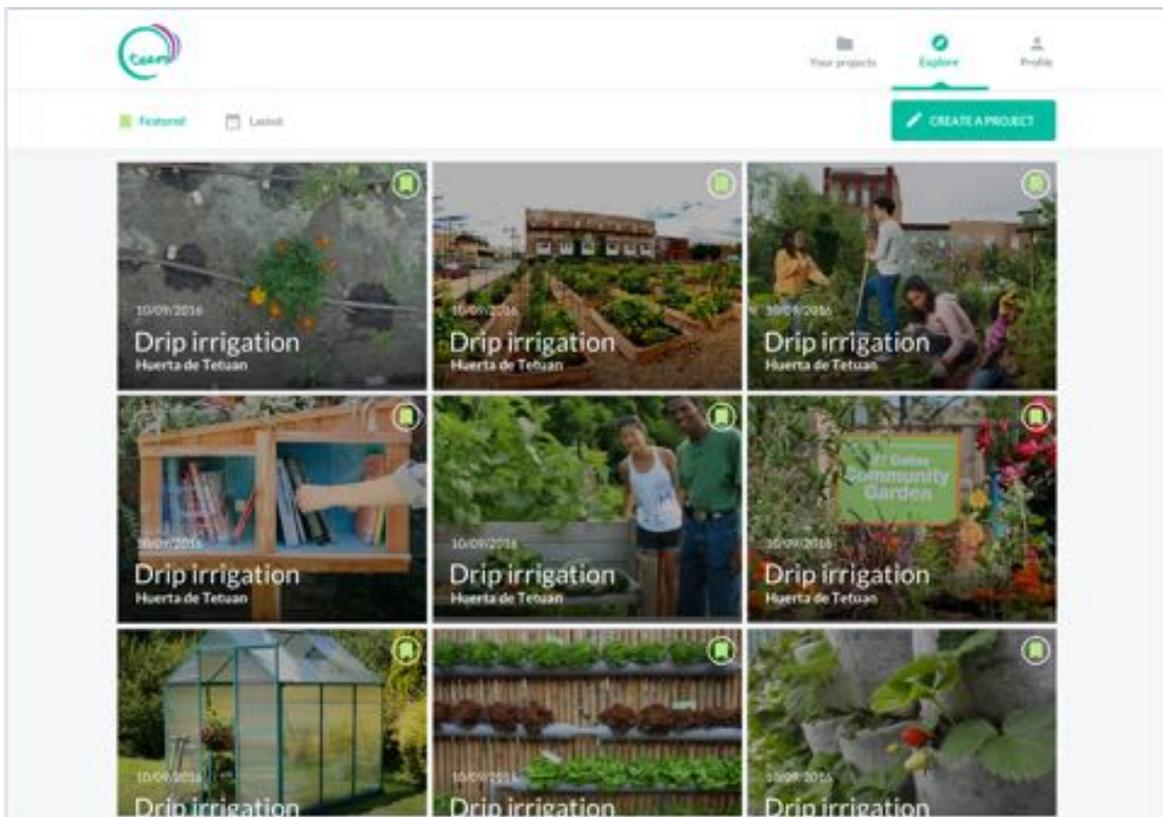


Figure 3: Teem desktop exploration view

### *Social Sharing & Integration*

Communication, collaboration and contribution are done nowadays using a wide ecosystem of tools, far from the approach of a single tool for all purposes. Accordingly, tools specialized in a concrete problem that can be integrated with existing tools are more easily adopted, than those that try to do too many things, or that are not prepared to interact in a diverse tool ecosystem.

Teem purpose is to help communities to get people involved. However, at the beginning, as with every tool, Teem does not have a wide and diverse community of users participating. Thus, we have integrated Teem with the most common communication and social tools such as email, Twitter or Facebook. Thanks to this multiple integration, organizers can share the projects they are proud of, or those for which they need a helping hand. This facilitates the discovery of interesting projects to potential contributors using their usual networks. It also help communities to bootstrap collaboration in a smooth and not disruptive way. Commoners may join the communities they support in Teem when they are willing to participate, meanwhile, they could receive updates through their usual social networks.

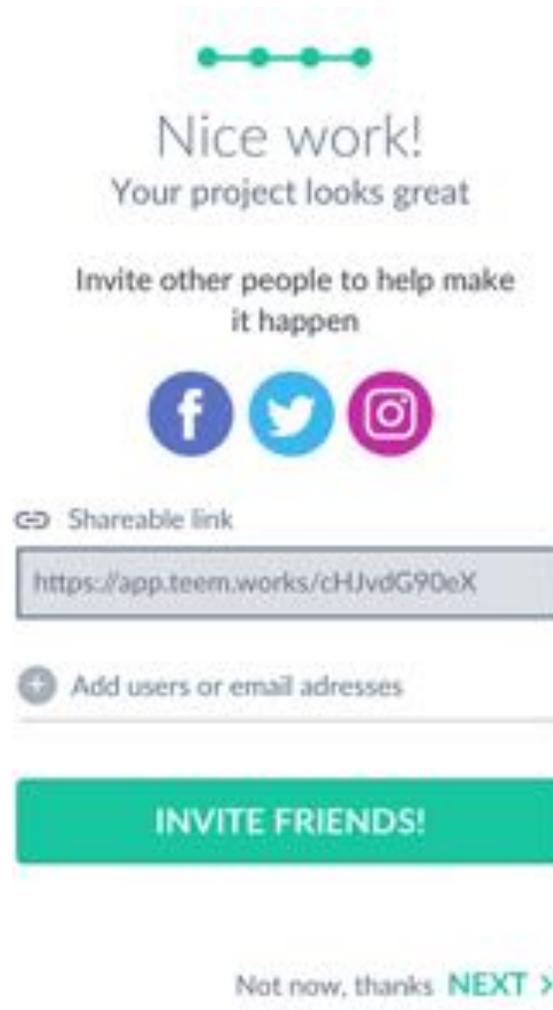


Figure 4: Sharing project options at creation

### *Collaboration workspace*

Teem's collaboration workspace is a central piece of the tool, and has been a key object of research and experiments during the project. The selection of communication and collaboration tools has been designed to fit the needs and culture of CBPP communities and their members. A collaborative editor, a group chat and a list of needs which can be integrated within the collaborative documents are the key tools of collaboration and communication provided to coordinate the work of the community projects.

- **Pad:** The “pad” or real-time collaborative document is intended to be used to coordinate each community project. In such document, organizers can share the information needed to start collaborating in the project, its current status and what has to be done. Links to other resources and working documents are encouraged, since Teem purpose is to attract collaboration and to coordinate each project's' work.
- **Chat:** A chat is offered for project related-conversations. It can be used to coordinate the work as well as to socialize or introduce new participants. It also allows newcomers a direct and quick way for expressing doubts and feeling included.
- **Tasks:** The need list is a list of “project needs” or tasks to be done. Needs can be marked as resolved, and they support comments for participants to share how they can contribute. The needs may be embedded in the pad, so they can be read in context and in an organized manner.

All three tools are intended to facilitate the welcoming of new participants and the coordination in a CBPP-oriented way, supporting both the voluntary (and sometimes irregular) participation of active contributors, and newcomers looking to get engaged in the projects. Figure 5 shows the collaboration workspace, where the pad and (embedded) needs can be observed.

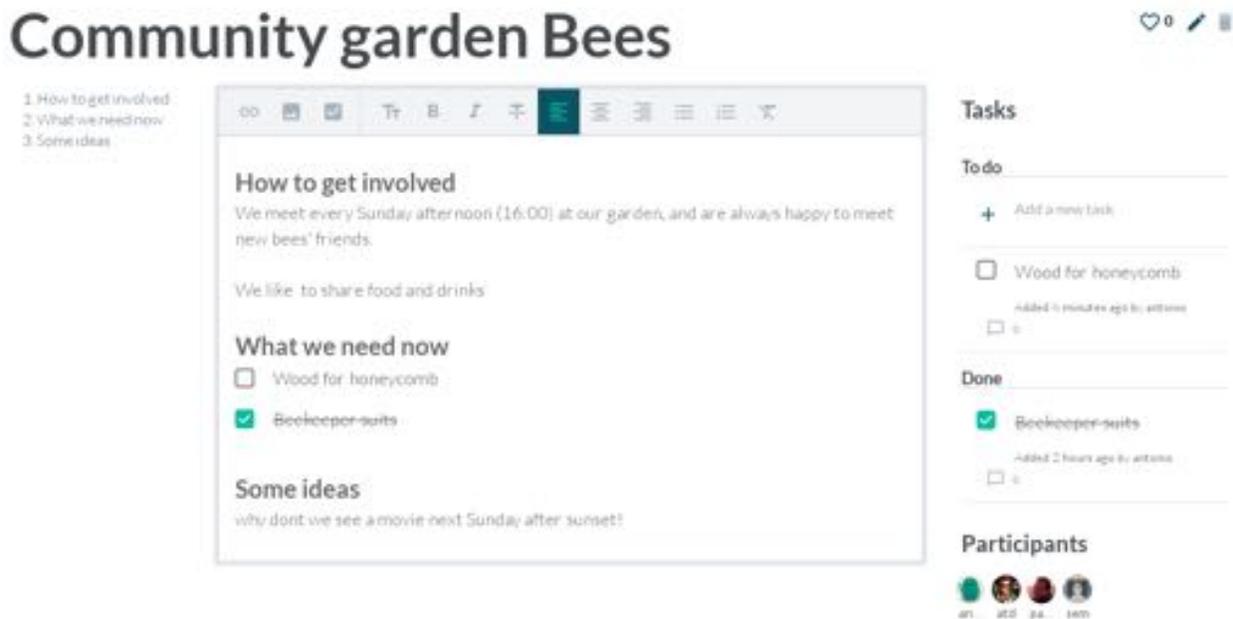
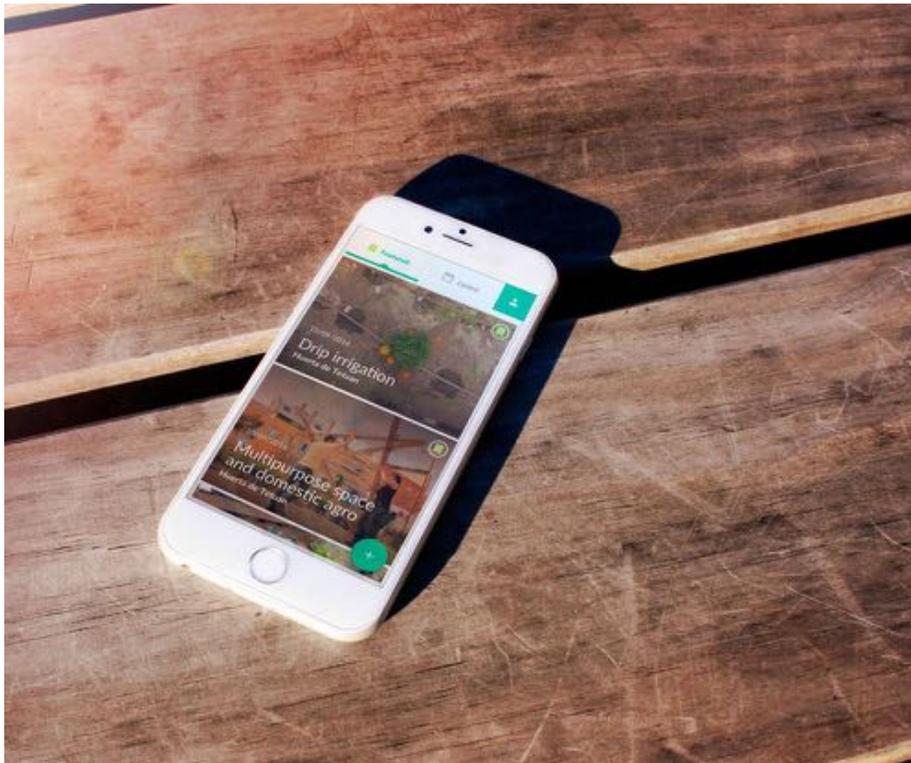


Figure 5, Teem collaborative workspace. Pad and needs integration view.

## 2. The Hidden Potential

Teem uses state-of-the-art technologies (e.g. AngularJS, Docker, MongoDB) in combination with P2Pvalue’s framework SwellRT. The different technologies used for the development were detailed in D3.3 and will not be covered here. This provides the following capabilities to Teem, which sensibly increase its potential:

- **Teem is decentralized:** Unlike centralized services such as Facebook or Google Docs, users could join different Teem providers which are smoothly interoperable, so users can transparently interact with communities or users hosted by different providers of their own.
- **Teem enables real-time collaboration:** The changes users do in the app, are shared simultaneously with all the users interacting in the same view (similar to Google Docs or Etherpad). This way, Teem is a tool for synchronous and asynchronous collaboration.
- **Teem is extensible:** The text editor that Teem uses can integrate widgets such as voting, rating, video viewing or others, in the shared text editor. One useful widget, the interactive tasks elements, is enabled and integrated by default, but other SwellRT widgets could be used and integrated in the Teem editor.



## 2. SwellRT: Decentralized Real-Time Collaboration

As already introduced previously, P2Pvalue has created and launched a development framework to build distributed real-time applications, SwellRT. During the 3rd year, this framework has been established as an independent robust product, with a special effort on facilitating the developer's work. Nowadays, it is a developer-friendly platform that facilitates the creation of modern real-time collaborative applications, which are decentralized and interoperable using modern protocols. Following P2Pvalue's Open Approach, the project is fully free/open source software and developed in the open<sup>5</sup>.

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<sup>5</sup> <https://github.com/P2Pvalue/swellrt>

This work has its origins on the Apache Foundation free/open source software project Apache Wave, which P2Pvalue re-engineered and built upon. An indicator of SwellIRT's success is that the actual Apache Wave project has asked us to adopt the SwellIRT codebase, discarding their own codebase. The conversations have evolved positively, and after some adaptations of SwellIRT code, the main Apache Wave developers agree to the merge, and the final official vote will be held by September 28th, 2016.

The most remarkable features developed this 3rd year are enumerated and explained below.

- **New API for Javascript integration:** A new API has been developed to facilitate JavaScript development. With the use of native proxy objects, JavaScript developers will be able to use real-time mutable SwellIRT objects. This makes the use of SwellIRT more natural to use in that language.
- **Widgets and annotations API:** The API for developing collaborative editor extensions has been updated to support the development of those extensions in a web native manner. The previous API made use of GWT code, which is a technology that is currently losing traction and that requires Java knowledge. (Figure 6)

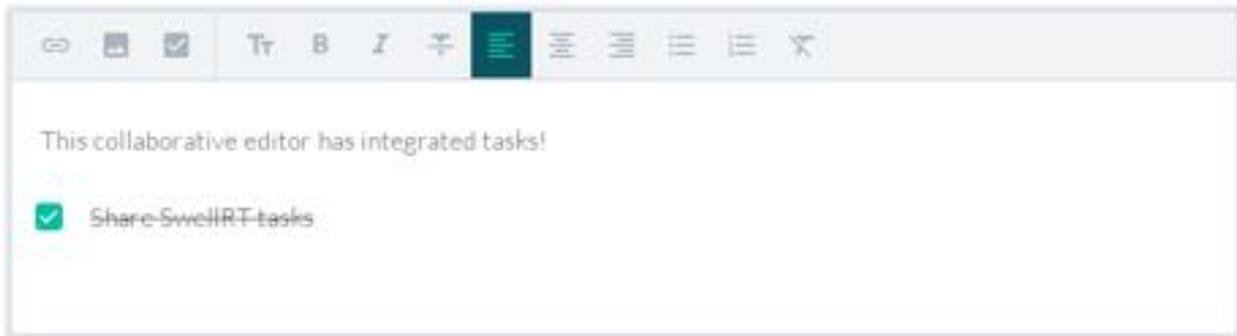


Figure 6: SwellIRT collaborative editor with a task widget.

- **Web editor presence:** The presence capabilities of the collaborative editor has been sensibly improved, enabling the perception of concurrent participation within the editor.
- **Renovated federation infrastructure:** Within the frame of a Google Summer of Code 2016 internship that the project obtained<sup>6</sup>, the open standard protocol used for federation among SwellIRT servers has been replaced. The change helped to solve multiple problems that the previous protocol XMPP presented, and to adopt a more robust and state-of-the-art technology for this purposes, Matrix<sup>7</sup>.
- **Reference collaborative editor with latest web technologies:** A reference implementation of a collaborative editor using latest Angular 2 has been acquired and open-sourced as a proof of concept of the potential of SwellIRT for collaborative application and editors development<sup>8</sup>.

<sup>6</sup> The Google's grant-holder and developer intern was Waqee Khalid: <https://github.com/Waqee/>

<sup>7</sup> Matrix. <https://matrix.org>

<sup>8</sup> JetPad. <https://github.com/devialab/swellrt-pad>

- **Improvement of the documentation:** The documentation has been sensibly improved to facilitate adoption and exploitation. It is published in a public wiki at [github.com](https://github.com/P2Pvalue/swellrt/wiki)<sup>9</sup>.
- **SwellRT development contest:** A development contest to develop SwellRT-based applications, with 6000€ in prizes, was launched. It helped to increase visibility among free software developers.
- **Landing page:** A new landing page has been launched with an improved message to improve the impact of SwellRT among developers (see Figure 7).
- **Product design, branding and communication:** Research has been conducted to identify how SwellRT can be better introduced to the developer community, in order to be established as a mature valuable independent project. The branding has also been improved for dissemination and product image.



Figure 7: SwellRT Landing page.

<sup>9</sup> <https://github.com/P2Pvalue/swellrt/wiki>