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Abstract: This document describes the implementation of the participatory budgeting tool created for citizens to influence and monitoring budget allocation, as part of the OpenBudgets.eu project, in three different pilot municipalities, as well as the feedback received from the municipalities.

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Executive Summary

Guided by the understanding of stakeholders' needs obtained in task 7.1, "Assessment Report", and following the development of the tools described in D.7.2 y D7.3 (for influencing budget allocation and for monitoring the budget execution afterwards, respectively), this deliverable describes their implementation in three national pilots.

Based on their previous participatory experience, and on their willingness to implement the tools in their jurisdictions, we chose three possible municipalities to implement the pilots: Torrelodones (28.000 inhabitants, Madrid), Alhama de Murcia (20.000 inhabitants, Murcia) and Portugalete (48.000 inhabitants, Basque Country). The first two had already implemented off-line participatory processes in the past, while the last one hadn't, although it had a strong participatory culture in other areas.

In order to implement the platform in the three locations, we maintained conversations with both political and technical representatives from the municipalities, in order to analyze their needs and priorities, as well as resources available. Afterwards, three instances of the application were set up, customized for each deployment and filled with the appropriate data, so the municipalities could run online public budget consultations and gather citizens' comments and preferences over a concrete set of proposals. A number of requested changes and improvements were implemented during this pilot phase, and are detailed in this document.

As this report is written, the participatory processes in Torrelodones and Alhama are still running, and the approved proposals will be monitored by citizens once the processes conclude.

Despite the initial commitment of the three municipalities, the political landscape in one of the locations, Portugalete, has changed significantly, making the implementation of the platform unclear at this point. Due to this political hurdle, we are currently evaluating the possibility of replacing this location with a second wider-reaching participatory process in Torrelodones, starting September 2017.

Abbreviations and Acronyms

PB	Participatory Budgeting
IT	Information Technologies
CSS	Cascading Style Sheets
SPF	Sender Policy Framework
DKIM	DomainKeys Identified Mail
MVP	Minimum Viable Product
SMTP	Simple Mail Transfer Protocol

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None included.

1 Introduction

The objective of WP7 is to facilitate and promote the engagement of citizens and other stakeholders in the pre and post budget decision-making process. To do so, stakeholders are given tools to influence and give feedback on budget allocations. Public administrations leverage these instruments to receive and effectively manage the feedback received, enabling greater degrees of active citizen involvement and participation.

In most cases budget preparation and approval is a closed-door process within administrations. Citizens and other stakeholders usually stay outside the process impeded by factors such as lack of resources to influence decisions, lack of understanding of the different budget concepts and line items, and ignorance of the approval process. Public administrations, especially at local and regional level, perceive participatory processes as high-cost and difficult-to-manage experiments. Tailor-made digital solutions in small- and medium-sized cities can be expensive and difficult to implement, particularly in an expenditure-reduction context.

The final aim of WP7 is to enable real participatory experiences and decision-making processes, providing solutions that are easy to implement by all stakeholders involved, thus strengthening the democratic process. This deliverable describes the implementation of the tools developed in Task 3, and described in D.7.2 and D.7.3:

- D7.2 described a tool for citizens to express their budget allocation priorities during the budget approval process.
- D7.3 described a tool for citizens to monitor the delivery of proposals selected through a participatory process.

As part of the pilot phase, we have:

- Offered quick responses and support to administrators and participants during implementation processes in the different municipalities. Information about the feedback received and its impact in implementation decisions is offered below.
- Increased competences and capabilities of the administrators managing the platforms, explaining to them all the steps needed to create, vote and monitor proposals in their jurisdictions.
- Studied and assessed the technical needs of the municipalities involved in the pilots program.
- Implemented some of the requests and improvements demanded by the pilot administrations.

2 Solution approach

In earlier tasks of WP7, following recent studies on PB processes, we identified tools that allowed users to work over the whole local budget, both on the revenue and expenditure sides, versus tools which enabled users to choose among a list of possible budget allocations and investments. We opted for the latter, due to its more widespread adoption across Europe.

The developed PB tool targets initially small and medium municipalities, since larger European cities such as Madrid, Paris or Barcelona are already running their own participatory platforms that include or might soon include a PB process feature. The [Consu!](#) application in Madrid and the custom platform from Paris are good examples of capitals trying to lead the participatory movement in Europe through the development of their own software solutions. Please refer to deliverables 7.2 and 7.3 for further detail.

Regarding the **technologies used**, the OBEU PB tool is a responsive web application built with Ruby On Rails 5 using Bootstrap 4 as the CSS framework of choice, mixed with

some of the visualization components of the D3.js JavaScript library and backed by Postgres 9.x in the data layer. It has been conceived as a multi-tenant, on-demand, highly modular application in the form of software as a service (SaaS), suitable for the requirements of a wide range of municipalities, and easily connected with their existing systems.

In order to encourage **reuse**, the development process is open and the code is hosted in a public GitHub repository (<https://github.com/openbudgets/participatory-budgeting>) with GNU Affero v3 license. Both project issues and public code contributions are managed within the GitHub repository with the built-in tools 'Issues' and 'Pull requests'.

3 Implementation of the Voting tool

3.1 Homepage

Welcomes the user and shows the different steps of a PB process. Depending on the current stage of the process, users will access different functionalities, e.g., process description and awareness raising, voting, monitoring process.

The Administrator of the web is able to open/close any section, and to modify the contents displayed in each of them.

As part of the pilots, the homepages were customized to match the look and feel of each municipality official website. The application source code was refactored to simplify this process, so different deployments maintain their own appearance while sharing the core application logic.



The screenshot shows the homepage of the PB voting tool for Torrelodones. At the top, there is a header with the municipality logo and the text 'Torrelodones eres SOMOS'. To the right, there are links for 'Iniciar sesión / Registrarse'. The main heading is 'Participa en tus presupuestos' with a sub-heading 'Bienvenido al proceso de presupuestos participativos de Torrelodones'. Below this, there are three numbered steps:

- 1. Anuncio del proceso**
La idea para este primer año de presupuestos participativos 2017 de Torrelodones es elegir entre varias de las propuestas más votadas tanto en el pleno infantil de noviembre 2016 como el pleno juvenil de abril de 2017, ambos disponibles en la web municipal, sección de infancia. También hemos añadido una instalación de vóley playa en el polideportivo municipal. Partimos de una partida de 100.000€ que serán ejecutados a lo largo del último trimestre de 2017 con las propuestas más votadas.
- 2. Proceso de votación**
Puede elegir tantas propuestas como desee, siempre y cuando no sobrepase el presupuesto disponible.
[IR A LA VOTACIÓN](#)
- 3. Resultado del proceso**
El proceso participativo ha terminado y las propuestas ya han sido votadas. Ahora puede supervisar el progreso de las propuestas elegidas.

The footer contains the OpenBudgets.eu logo, the text 'es una herramienta de Presupuestos Participativos desarrollada por CIVIO', and links for 'Términos de servicio' and 'Política de privacidad'. At the very bottom, there is a small line of text: 'OpenBudgets.eu ha recibido financiación del programa H2020 EU research and innovation programme de la Unión Europea en virtud del acuerdo de subvención Núm. 645833.'

Figure 1: PB voting tool process start page in Torrelodones

3.2 Log-in

We use a password-less system, inspired by Medium, to simplify the user experience, avoiding users the need to create and store passwords.

The Minimum Viable Product (MVP) produced in Task 3.2 only asked for the user email. During the pilots, to match customer's demands, the application was extended so it would support custom authentication mechanisms and custom fields during user sign-in. E.g.

the Torrelodones deployment, the municipality wanted to be sure only local citizens could vote, so the application asks new users for the ID card number and birth date, details which were validated against a copy of the local census.



Figure 2: User sign-in page in Torrelodones, showing additional custom fields

Once an email address is provided, a message will arrive to the voter's inbox instructing the voter to use the included link to sign in into the web application. By clicking that link the voter will be verified, redirected to the web application and asked for an optional friendly name, to be used in later communications.



Figure 3: Asking for the user's real name (optional)

Alternative validation mechanisms can be easily implemented: for example, the user could be asked to provide a mobile phone number, and the application could then send a code via SMS. This is a common requirement in some participatory process, like the one conducted in Madrid, but it wasn't implemented because it wasn't requested by any of the pilots.

3.3 Voting page

The voting page has been designed for simplicity and speed as an "All in one page", which gets updated dynamically based on user choices for a better user experience. It also features different mechanisms to organise the page according to the users' needs: the page has several ways of filtering proposals (e.g. by district, by amount or by the tags associated to the proposal).

The validation of the voting process is automatic. Voter's chosen options are validated both at the browser's and server's sides, so it is impossible for a user to allocate more budget than given by the municipality.

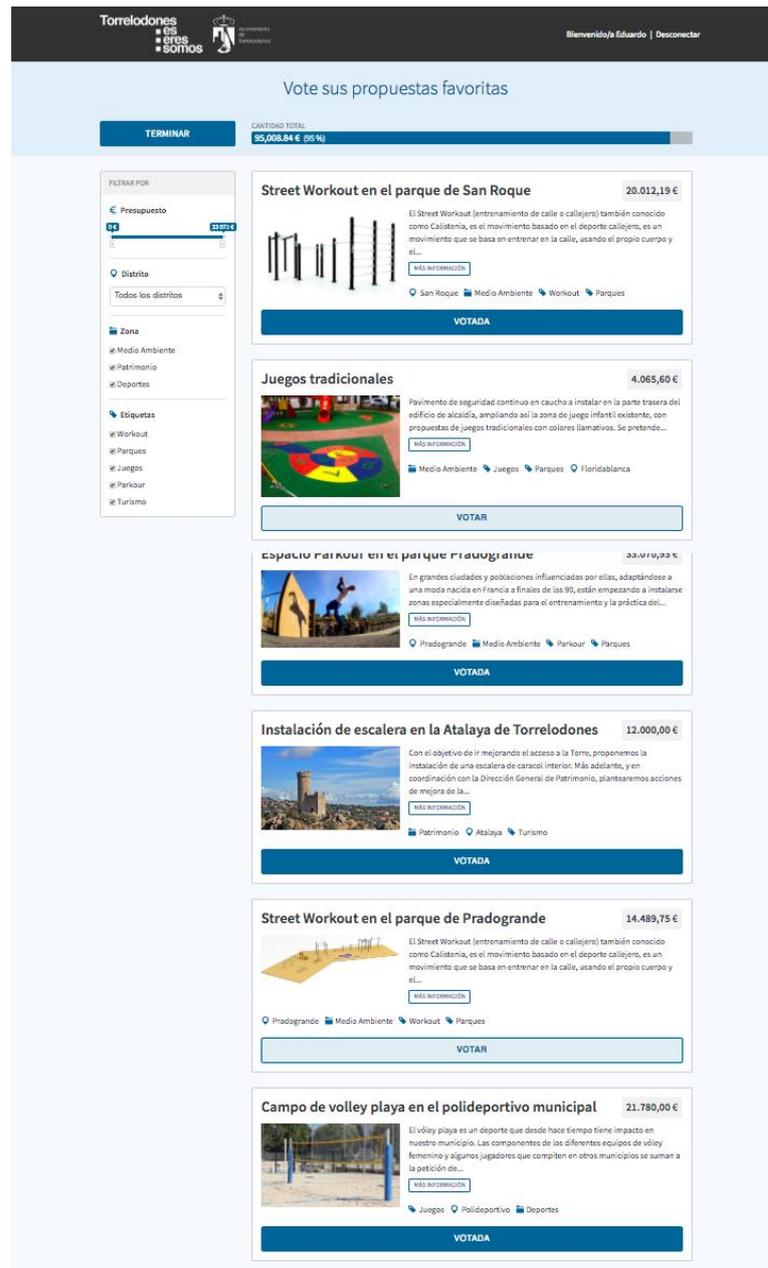


Figure 4: Voting page in Torrelodones, games for children’s parks

3.4 Results page

The user can see a visualization of the proposals she selected, together with the details of all of them. The treemap displayed by the platform enable users to understand where they have allocated the available budget, creating visual awareness of the decisions taken.

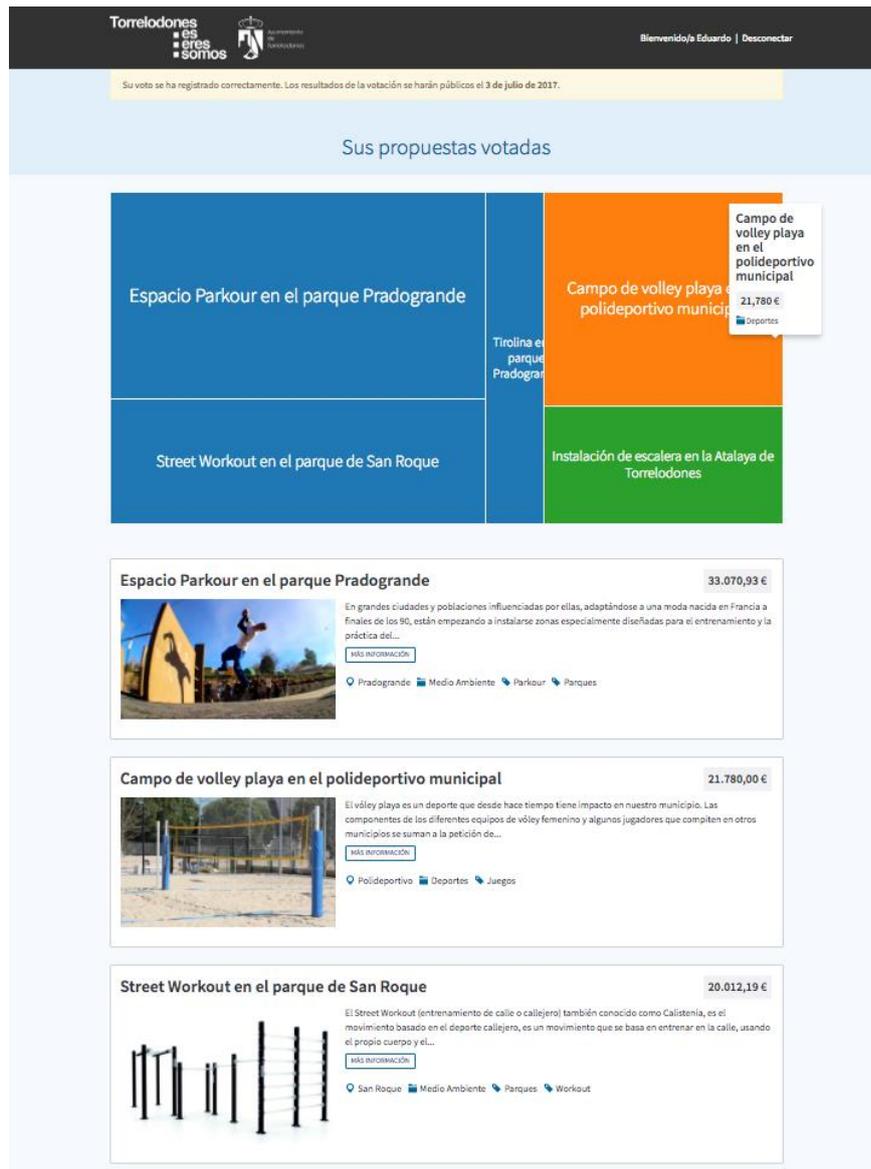


Figure 5: Summary of voted proposals

3.5 Admin

The Admin side of the tool is restricted to the persons dedicated to control and govern the PB tool. Public officers can, among other tasks, create different proposals and categories, or add several tags to better identify proposals.

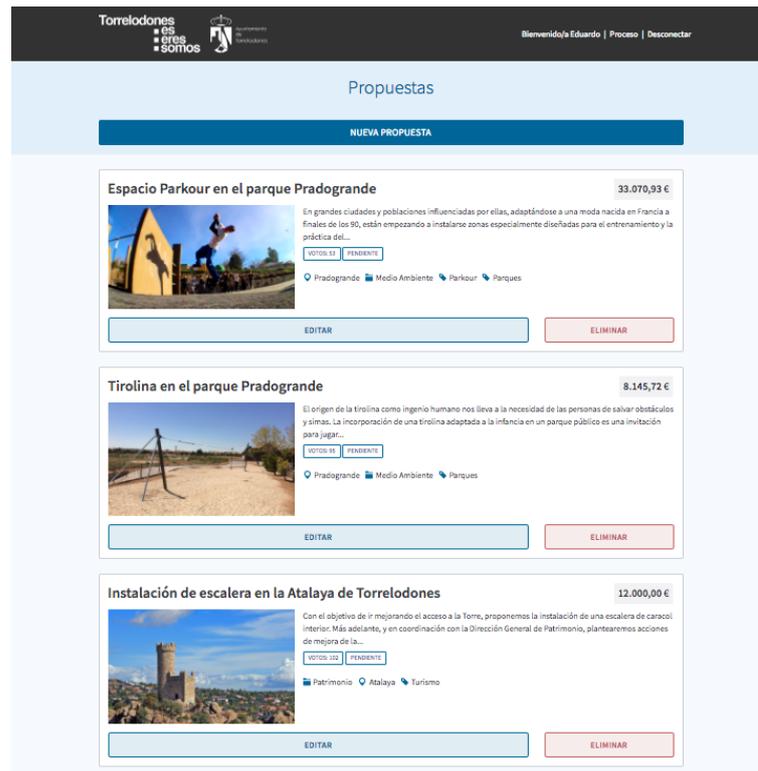


Figure 6: List of available proposals in the Admin section

During the pilot implementations, after initial discussions with the municipalities, it was found that pictures were an important feature to be added to the MVP. The Admin section was improved accordingly, so administrators could upload, modify and assign a photo to each proposal. The ability to add multiple pictures, and even attachments, is currently under discussion.

Editar propuesta

[← ATRÁS](#)

Campaña
Equipamiento infantil y juvenil

Propuesta
Título
Instalación de escalera en la Atalaya de Torrelodones

Descripción
Con el objetivo de ir mejorando el acceso a la Torre, proponemos la instalación de una escalera de caracol interior. Más adelante, y en coordinación con la Dirección General de Patrimonio, plantearemos acciones de mejora de la seguridad de la parte superior de la Atalaya con el objetivo de fomentar las visitas, tal y como solicitaron los alumn@s durante el pasado pleno infantil de noviembre 2016.

Presupuesto
12.000,00

Imagen

[Eliminar imagen](#)

[Choose file](#) No file chosen

Distrito
Atalaya

Zona
Patrimonio

Etiquetas
 Juegos
 Tirolina
 Parkour
 Parques
 Workout
 Turismo

Monitorización
 La propuesta se ha completado

[Guardar](#)

Figure 7: Editing one Torrelodones proposal in their Admin section

4 Implementation of the Monitoring tool

Once the voting process has finalized, users can follow up on the proposals that have been selected. The proposals are selected automatically once the voting phase is completed using the following algorithm: the most voted proposal is selected first, and its amount is subtracted from the money pool allocated by the municipality; then, the next most voted proposal is selected, as long as its needed amount fits in the remaining pool. The process continues until the pool is allocated fully or until the remaining proposals exceed the available funds. Proposals with zero votes are ignored.

During the implementation of the proposals, users are able to place questions and comments that are received by the local representatives responsible of implementing the proposal.

Every proposal has a different degree of completion. Statuses might vary depending on various factors, e.g. licenses needed to begin with the work, local departments involved and coordination, budget-lines approval, etc.

4.1 Homepage

Welcomes the user and shows the different steps of a PB process. Depending on the current stage of the process, users will access different functionalities, e.g., process description and awareness raising, voting, monitoring process.

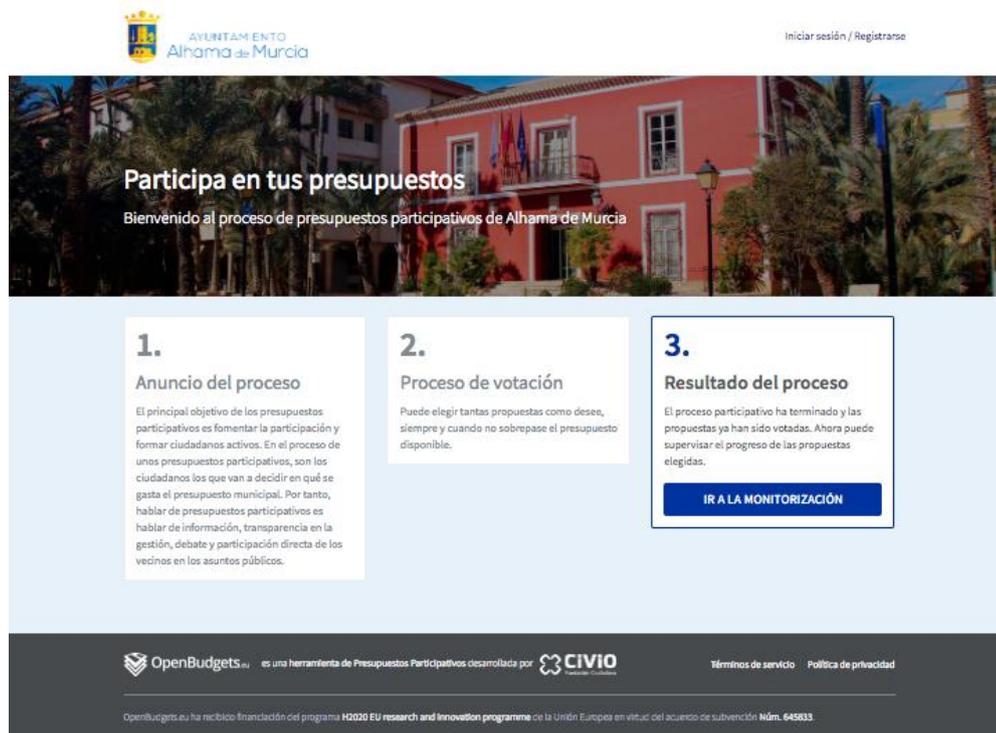


Figure 8: Homepage for Alhama, showing a process in the Monitoring phase

4.2 Log-in

The information about the winning proposal is publicly available to everyone, but users need to log in in order to add comments.

We use a password-less system, inspired by Medium, to simplify the user experience, avoiding users the need to create and store passwords.

The Minimum Viable Product (MVP) produced in Task 3.2 only asked for the user email. During the pilots, to match customer's demands, the application was extended so it would support custom authentication mechanisms and custom fields during user sign-in. However, the pilot where Monitoring was tested didn't require additional verification, and only the user's email address was used.

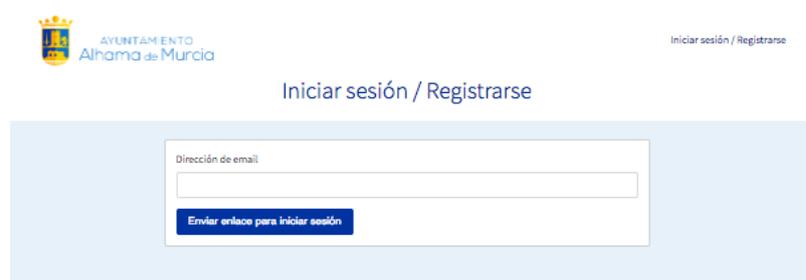


Figure 9: Alhama's log-in page, requesting user's email address

Once an email address is provided, a message will arrive to the voter's inbox instructing the voter to use the included link to sign in into the web application. By clicking that link the voter will be verified, redirected to the web application and asked for an optional friendly name, to be used in later communications.

4.3 Monitoring page

The monitoring page has been designed for simplicity and speed as an "All in one page", which gets updated dynamically based on user choices for a better user experience. It also features different mechanisms to organize the page according to the users' needs: the page has several ways of filtering the selected proposals (e.g. by district, by amount or by the tags associated to the proposal).

The screenshot displays the 'Monitorizar las propuestas elegidas' page for the Ayuntamiento de Alhama de Murcia. The page features a sidebar for filtering proposals and a main content area with five proposal cards. Each card includes the proposal title, budget, number of votes, execution status, a brief description, a 'MÁS INFORMACIÓN' link, and associated tags.

Propuesta	Budget	Votes	Estado
Formación cívica y medioambiental	3.000,00 €	414 VOTOS	EN CURSO
Senda Gebas - Alhama	8.000,00 €	380 VOTOS	EN CURSO
La bici como medio de transporte	3.000,00 €	674 VOTOS	EN CURSO
Apertura de las pistas deportivas de los colegios	20.000,00 €	480 VOTOS	EN CURSO
Campaña de sensibilización sobre movilidad reducida	12.000,00 €	638 VOTOS	EN CURSO

Figure 10: Monitoring page for Alhama, showing approved proposals

Users can view the number of votes and the execution status of the selected proposals, and they can also engage with the public officials in charge of the proposals execution by leveraging the built-in comments functionality.

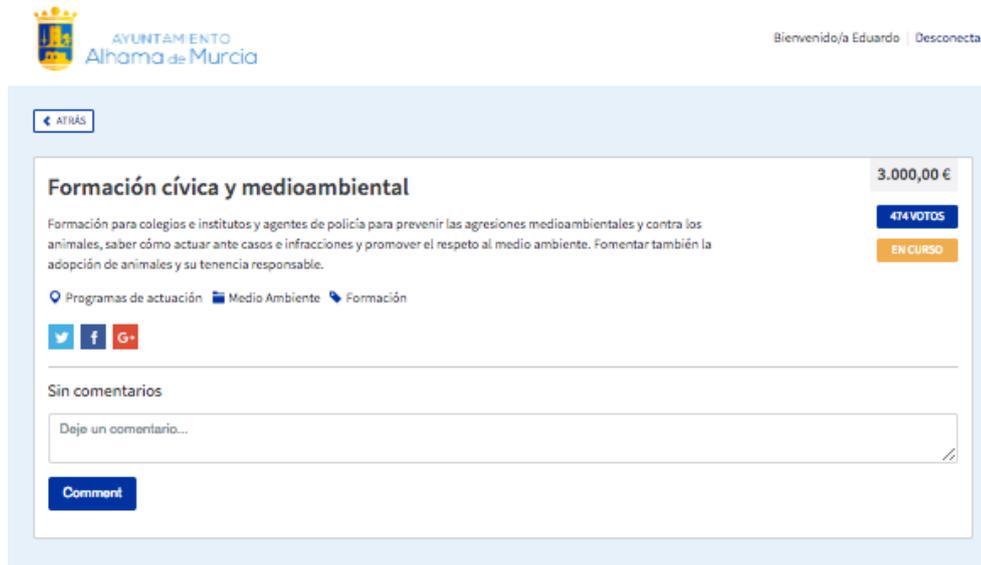


Figure 11: Monitoring page for one ongoing proposal. No comments added yet

5 Developments during pilot phase

During the pilot implementations, some specific needs were requested, which led to some additional developments:

- **Look & feel customizations.** One of the first requirements in all of the municipalities taking part in the pilot process was to be able to customize the look & feel of the web application.

We have devised a mechanism to apply a custom styling to each of the different application deployments by factoring out the common elements and isolating just the customizable ones.

- **Custom voter authentication secrets.** An extensible authentication system was in place to easily support custom authentication integrations, but in the end a variable payload column, which stored variable payload data to enable different requirements for voter validation, was enough to fulfill the requirements of the pilots.
- **Customizable admin roles.** Our preference was to have the list of admin roles be a part of the deployment process configuration, but having the information in the database turned out to be more practical.

An admin role is defined by a specific email (e.g. 'david@civio.es') or by an email domain (e.g. '@civio.es').

A sample domain-based role has been added to the database seeds, and functionality to add/update/delete roles has been included in the Admin section.

- **Internationalization and localization.** The initial development only supported the English language, but it was soon clear that support for different languages and number formats was needed.

Localization support for five locales has been added: EN, ES, EL, DE and FR, of which EN, ES and EL are completely available.

In order to simplify the translation work, an external service (translation.io) has been configured to deal with the keys and the translations.

- **Simultaneous multi-campaign support.** One of the municipalities involved in the pilots program (Alhama) had the requirement of being able to run several PB

campaigns simultaneously, while only single sequential campaigns were allowed to be run initially. Support for that kind of setup has been included, although further analysis and testing would be required.

- **Proposal image support.** One recurrent requirement was the support for some kind of proposal additional info and attachments. Support of this feature for some kinds of documents (images, PDFs, etc.) was discussed, and it was decided to only support image attachments as a first step.
- **Custom configuration capabilities for email provider.** We initially perceived the mailer service as a built-in application service, provided by an external provider (SendGrid) and shared by all the deployments, with a common no-reply@openbudgets.eu email from address.

Due to pilots requirement to customize the sender address and the email delivery problems we run into, it was clear that a more customizable solution was needed, so the mailer is now configured from environment variables entirely, i.e. both the email server details and the reply email address to be used.

- **Custom Facebook app configuration.** Support for social sharing through custom Facebook apps was a recurrent requirement, so a feature to be able to read a custom Facebook app ID from an environment variable was included.
- **Custom Google Analytics configuration.** The ability to be able to configure a custom Google Analytics account was also a recurrent requirement. The application now includes the Google Analytics tracking script if a Google Analytics key is present in the form of an environment variable.
- **Include deployment automation capabilities.** The automation of the deployment greatly simplified the tasks involved in a custom deployment of the application. To be able to include that kind of automation in a standardized and maintainable way the use of Capistrano was introduced.

The proposed Capistrano configuration uses different stages to allow the deployment of separate instances of the application, all in production mode. That is, a new deployment for a new instance would be defined in a new stage configuration file.

- **Add reminder messaging to voters.** The voter authentication process has proved to be highly sensitive to both email delivery problems and accurate voter census data. In order to try and mitigate those problems we've included a feature to automate the sending of reminder messages to the affected voters.

A Rake task has been added to automatically send a reminder message to those users that initiated, but didn't finish, the voter verification process.

Another Rake task has also been included to automatically send a hint message to those users that tried to register to the participatory process but didn't provide valid voter secrets.

- **Bug fixes.** Several bugs and undesired behaviors were detected during the pilots program that had to be fixed. Specific details can be found in the project public GitHub repository.

6 Implementation issues and lessons learnt

The pilots program has provided some challenges but it has also provided us with some useful lessons:

- **Customizations required.** We devised the application as a have-one-serve-all solution, with some basic look & feel customizations in mind, but the requirement

for more specific customizations appeared almost at day one. They weren't roadblocks, but it meant some unexpected additional work.

- **Email delivery problems.** By using a generic, non SPF & DKIM checked email domain, we run into some email delivery problems, specifically with some messages being wrongly marked as spam and some others not even being delivered, despite using a well-known specialized service, SendGrid.

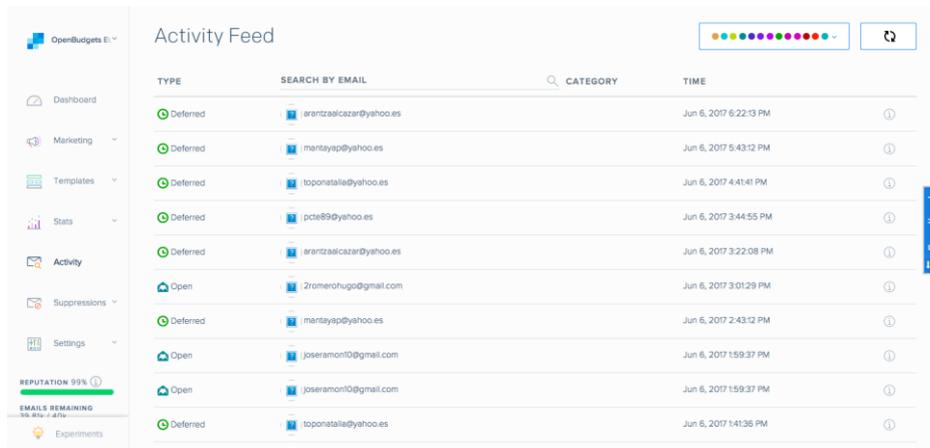


Figure 12: SendGrid's Activity Feed, showing delivery issues with Yahoo email address

Those problems were overcome in one of the municipalities, Torrelodones, by using its own SMTP server. Unfortunately, this meant losing access to SendGrid's monitoring console.



Figure 13: SendGrid's management console, showing delivery and opening status

- **Voter validation difficulties.** Although the voter validation process has proved to work smoothly, we've been consistently suffering from two main problems.

The first one was related to the previously mentioned email delivery problems. As the voter verification process relies heavily on the email verification, it can be seriously impacted if there is any problem with the email service. Once we managed to solve the email delivery problems, the problem became almost insignificant.

The second one was related to the accuracy of the census data provided by the municipalities to carry out the voter authentication. We ran into a high number of users that provided invalid voter secrets, and as they couldn't be properly authenticated their votes couldn't be registered. The solution to that problem was

out of our reach, and to try to mitigate it we started to instruct those users to contact their municipality to check the accuracy of their data.

- **Legal limitations.** In all of the municipalities involved in the pilots program we've faced legal problems regarding the terms and the regulation of the PB process. They were usually related to the time needed to start a legally binding voting process, and in some cases also public spending commitment.

In one case, Portugalete, this led to the possibility of dropping its participation in favor of a second wider-reaching participatory process in Torrelodones.

In the other cases we overcome those problems by piggybacking on previous existing processes.

- **Public officials' engagement.** It's been difficult in some occasions to keep the active collaboration of all the parties involved, as it seems that a free pilot program can be sometimes perceived as not worthy enough.

That said, the general attitude towards the pilot program and the web application has been excellent.

7 References

There are no sources in the current document.