D3.3: Platform and Component Adaptations

WP3 – e-Participation platform integration

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D3.3: Platform and Component Adaptations

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# Glossary of terms

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<th>Description</th>
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<tr>
<td>Dialogue</td>
<td>Dialogue is a general term for a Citizen engagement activity/project.</td>
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<tr>
<td>Post</td>
<td>Inputs under dialogues, called as petition, observation and idea according to the dialogue type.</td>
</tr>
<tr>
<td>Item</td>
<td>Item is an abstract representation of social media messages published in different social media platforms. In other words, an item can be a Tweet, a Facebook post, an image in Instagram, a video in YouTube, a comment on a video or a post, etc.</td>
</tr>
<tr>
<td>Original Item</td>
<td>A field that indicates whether an item is an original item or a share of a previous one. This can be also used as a filter.</td>
</tr>
<tr>
<td>Item Type</td>
<td>A field that indicates whether an item is a media item (i.e., contains an image or a video) or a text item. Can also be used as a filter.</td>
</tr>
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<td>Collection</td>
<td>A set of items representing a topic of interest defined by a user. Technically, a collection is defined as a set of keywords and a set of social media accounts. The items associated with the collection are those that contain these keywords or are published by these accounts.</td>
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<tr>
<td>Topic</td>
<td>Topic is a subset of items in a collection associated with a specific subject/theme.</td>
</tr>
<tr>
<td>Feed</td>
<td>A view of items associated with a collection. These items can be refined by the application of filters as platform, language, publication date, etc.</td>
</tr>
<tr>
<td>Dashboard</td>
<td>A view of statistics related to a collection such as the total number of items and users in a collection, the most active users in a collection, the top mentioned entities and tags, locations with high activity, etc.</td>
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<td>Entities</td>
<td>Named entities e.g., persons, organizations, and tags identified in the text of the collected items. These entities highlight the semantics of items.</td>
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<td>API</td>
<td>Application Programming Interface</td>
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<tr>
<td>DGT</td>
<td>Directorate-General for Translation</td>
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<tr>
<td>EMS</td>
<td>Experiment Management System</td>
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<td>JRC</td>
<td>Joint Research Centre</td>
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<td>LM</td>
<td>Language Model</td>
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<tr>
<td>MT</td>
<td>Machine Translation</td>
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<tr>
<td>RBMT</td>
<td>Rule-based Machine Translation</td>
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<tr>
<td>REST</td>
<td>Representational State Transfer</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SMT</td>
<td>Statistical Machine Translation</td>
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<tr>
<td>SRILM</td>
<td>SRI Language Modelling Toolkit</td>
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1 Executive summary

The deliverable D3.3: Platform and Component Adaptations is part of the Work Package 3: e-Participation platform integration. The purpose of this deliverable is to present the updated and final version features of the STEP platform, and to provide detailed information about the platform features according to its components and user types. The intended audience for this deliverable is primarily the project partners but the deliverable could be of interest also for the end users. The deliverable provides all internal communications and work carried out during other work packages.

The aim of this deliverable is to define the updated version of the integrated and tested STEP Platform after the piloting period. This deliverable acts as an updated version of D3.2 Integrated and Tested Platform. The features of the platform have been described with the user interfaces according to user types and based on core components of the platform which are: e-participation component, social media mining & visualisation component, machine translation & text to speech component and data logging in D3.2. Updated features of each component and additionally developed features and modules have been described in detail in this deliverable. In addition, features provided for localization of the STEP Platform according to pilot requirements are also presented.

With a continuous interaction process with the pilot partners, the STEP platform evolved in the second and piloting period. STEP platform provided a User Feedback channel in order to collect user experiences, bugs and additional feature requests while using the platform. This channel was used by all users including young citizens. Also STEP platform has provided an issue tracking system using the popular Atlassian JIRA tool on cloud. Within this open and collaborative approach, STEP platform increased the level of features provided to municipalities and citizens after handling around 400 requests/issues from pilot partners and users. The mobile STEP platform has been developed during this period. A STEP feedback channel for all users, STEP tutorials for citizens and admins, questionnaire, widget and code snippet features have been provided. All translations of the platform have been completed and the quality of the translations was checked several times by pilot partners. The STEP platform had several releases including a major one per quarter. Among these features, the questionnaire became one of the mostly used ones, the social media mining and monitoring tool has been extended with several new features like automatic keyword collection and new interfaces for cities to manage their content. Machine Translation and Text to Speech features have been provided for all languages, including mobile interfaces. Also reviewers comments during this period have been taken into account and issues like integration, navigation through the platform, locating apps on the web interface, view modes for youngs, iOS, Android technical and usability improvements, social media mining and visualization improvements, some more gamification improvements and instructional and motivational user tutorial videos have been both fixed and developed in the second period.

Within an effective piloting period, the STEP platform became competent for the aims and uses of the pilot partners and all of them have provided several dialogues and questionnaires using the capabilities of the platform. This deliverable provides all the features and updated capabilities of the platform in detail as a reference toolkit for pilots and all European cities.
2 Introduction

The aim of D3.3: Platform and Component Adaptations deliverable is to present the updated and final version of the STEP platform. The deliverable includes the updates of platform’s features during the piloting period, presented mainly from the user and user interface point of view, as well as ethical issues and work done for the achievement of project objectives.

The general project requirements/objectives are fulfilled by STEP via a number of core components, which include:

- e-Participation component
- Machine Translation & Text to Speech component
- Social Media Mining & Visualization component
- Data Logging component

Chapter 3 provides detailed information about the STEP Platform and Component Adaptations during the piloting period including its main features according to components and user types.

2.1 General Concept of the STEP Platform

The STEP platform brings together several ideas and technologies with the goal to engage Young European Citizens and Public Authorities in decision making about environmental strategies, policies, plans, programmes, laws, and projects.

The main concepts underpinning the STEP project - also presented in Figure 1- are:

- **Integrated platform:** STEP uses social media / web mining technologies that enables young people to view personalized and enriched information relevant to the topic they are viewing, filtered through multiple social media and web sources, in one unified environment. This eliminates the need to search for content on multiple platforms, and to navigate through the overflow of information available.

- **Engagement:** Social media analytics and monitoring tools are used in order to facilitate the identification of the preferences of young people, and thus develop an effective strategy for engaging young citizens.

- **Motivation:** Social gamification techniques are used for increasing motivation for participation of young citizens.

- **Removal of language barriers:** Machine translation technology allows users to access content from other countries in their own language, removing language barriers and fostering cross-border interaction.
Policy-making support: Visual representations of results enables policy makers to interpret the results of their campaigns, view patterns and spot trends, facilitating decision making.

Inclusion: STEP applied specific actions for the inclusion of young people with fewer opportunities (because of social/economic obstacles, cultural differences, etc.), including dedicated workshops for those who are not familiar with the use of digital tools, info kiosks, and special dissemination material.

Figure 1 STEP underpinning ideas and impact

The STEP platform is based on a modular architecture, integrating individual components which are developed / adapted so that they can carry out specific business functions, and can be reused, each one individually, by public organizations for quickly opening their decision-making processes. This is especially important for public organizations that already have well set-up procedures for managing participation, and do not want to replace them. Public organizations can however benefit from the use of partial components of STEP, according to their needs, thus integrating them in their regular practice. For example, the social media / web mining component may be used by public organizations for identifying citizen trends, and the social media monitoring tool for planning effective participation strategies.
3 The STEP Platform & Component Adaptations

The STEP platform consists of four main components. The detailed information about the architecture of the platform and components are explained in the deliverable D3.1 Architecture and Integration Framework Definition Specification. This chapter presents the core features of the STEP platform which are e-participation, social media mining & visualization, machine translation & text to speech and data logging components.

Using the STEP platform, Public Authorities become able to:

- Create and publish dialogues on issues with an environmental impact, initiating talk table conversations to engage young citizens to express their ideas and participate in decision making-processes
- Collect, monitor and analyse results of the dialogues
- Identify impacts and spot trends
- Evaluate user choices such as level of usage of platform components, dialogue paths, use of system elements level of usage of user interface elements
- Motivate young citizens participation through gamification techniques (leaderboards and badges)
- Create reports and newsletters to inform about the results of dialogues

Using the STEP platform, young citizens are now able to;

- Express their opinions about environmental issues and participate in decision making processes
- Be informed on what other people are saying on the specific issues of interest, filter relevant information from noisy content on social media and web streams
- Monitor their contributions, get feedback on the results of the processes in which they have participated, and on how their contribution has made a difference
- View personalised and enriched information on emerging topics from social media and the web, relevant to the consultation they are participating visiting

3.1 E-Participation Component

The cloud e-Participation component is the central module of the STEP platform, allowing the interaction between end users (policy makers and young people) and the communication with the other platform components. In this section the e-participation component is described in detail according to the following;

- Features of front page
- Features for public authority users
- Features for young citizens
- Localization of the platform
- Native mobile applications of the platform

Considering the aim of the STEP platform, there are two classes of users which are Public Authority users and Young Citizens, and four different user types as follows;
Public Authority Admin
Public Authority User (Analyst)
Young Citizen (Creator)
Non-registered User (Rookie)

Each user type has different rights and access to different features accordingly.

### 3.1.1 Features of the front page

The first version of the STEP e-participation platform consisting of main components and features has been delivered and is accessible from [https://step.green/](https://step.green/).

![Figure 2 Landing page of step.green](https://example.com/figure2.png)

**Figure 2 Landing page of step.green**

Different engagement activities have been placed on the front page of the platform in order to allure visitors to click on the website. The activities that can be reached from the front page are:

- Selecting your pilot STEP city including an EU wide pilot (STEP EU Pilot)
- Login/Register
- Get Feedback from Footer pages (About, Terms & Conditions, Privacy, Social media accounts)
- STEP Feedback Mechanism
- Switching Languages between English, Turkish, Greek, Spanish, Catalan, Italian, Swedish
- Tutorials
- Share ideas for a greener Europe’s dialogue
- Timeline feature

#### 3.1.1.1 STEP User Feedback Channel & User Tutorials

The STEP Platform has a User Feedback mechanism that works on the platform like all other dialogues. STEP User Feedback Channel is accessible through an icon on the left of the language flag (red in circle) (Figure 3)
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and also in the footer part of all dialogues. Users, citizens are able to provide their feedback regarding the platform easily using the feedback link. STEP also provides easy to reach training materials that are created as videos. Users of the platform can reach out the tutorial video and get more information about how they can use different functionalities of the platform (Figure 4).

Figure 3 STEP Quick links for tutorials and user feedback

Figure 4 STEP Public User Tutorials

STEP Issue Tracking and User Feedback
STEP User Feedback Channel was provided as a public channel for all users to join and provide their comments related with bugs, issues and new ideas regarding the platform. This dialogue and interaction worked well with different sets of users including pilot admin users who selected this approach to provide their feedback. Around 100 requests and issues have been reported including adding a questionnaire for user feedback, bugs, translation errors and additional feature requests (Figure 6). When we analyze these 100 request, we realized that most of these requests are also being reported by consortium members of pilot administrators. Only a few young users have identified this way of sharing their ideas on the platform. This created a question mark on us about the ambiguity of the feedback icon. This is also reported during the interviews. Users that STEP consortium interviewed didn’t know how to leave feedback. With this mechanism we expected useful feedback from young people but haven’t succeeded. This feedback opportunity have been made clearer for young people such as pop-up messages that doesn’t annoy the users like only once after their repeated logins to the platform.
STEP platform has provided an issue tracking system for its pilots using the popular Atlassian JIRA tool on cloud. Pilot users and other consortium members are allowed to report all bugs, issues, features requests internally using this cloud tool easily. 272 requests were reported during the second period and all developments and updates in this document are developed accordingly to the requests on the JIRA issue tracking system. This tool acted as a bridge between users and the technical team also used as an agile project management tool by the development teams. Some statistics regarding the components distributions are given below (Figure 7).

![Figure 7 STEP Issue Tracking System – Dashboard view](image)

### 3.1.1.2 General Dialogue for all European Citizens: ‘Ideas for a greener Europe’

On the front page, a general dialogue for all European citizens has been created in order to collect ideas all around Europe on how Europe can be better and greener. Similar ideas have been clustered to innovative concepts/bigger ideas that can be shared to European policy makers and by the general public. Also an EU wide STEP pilot has been launched and is accessible through the pilots list or directly via [https://step.green/eu](https://step.green/eu).
3.1.1.3 Timeline feature

The general timeline on the front page is a poll which seeks to engage young citizens to place events on a timeline and thereby leave their footprint on how Environment in Europe should be prioritized. After submitting their own input, young citizens can see the average (collective) result and also how the other participants’ inputs are spread over time/impact among different users.
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### 3.1.2 Localization of the STEP Platform

Localization of the STEP platform is implemented in two different aspects;

- Translation of local resources of the platform and availability of STEP in each pilot’s own language
- Localization of pilot requirements based on the flows and processes of the STEP platform components

STEP platform supports 7 languages including English, Turkish, Greek, Italian, Spanish, Catalan and Swedish.

The STEP platform has been translated into the language of the pilot partners using the STEP translation tool in admin tools with above 3000 different translation items.

![Figure 10 Translation tool](image)

![Figure 11 An example of Translation of Resources: Footers in Different Languages](image)

Pilot accounts have been created within the platform and are accessible through the following links in their local language;
Association of the Communities of Locride (https://it.step.green/locride)
Mollet des Valles Municipality (https://cat.step.green/molletvalles)
Valdemoro Municipality (https://es.step.green/valdemoro)
Region of Crete (https://gr.step.green/crete)
Hatay Metropolitan Municipality (https://tr.step.green/hatay)
Thessaloniki Municipality (https://tr.step.green/thessaloniki)

Some of the features have been deployed to the STEP platform after continuous iterations with pilot partners are as follows:

Figure 12 Front pages of STEP pilots
Gender and age data have been added to the registration process (optional to add on municipality level)

Various embeddable Snippets for pilot homepages of their websites have been provided through the STEP Platform

Dialogues can be seen in map view and petitions are created by selecting location on the map

Questionnaire Management
Widgets & code Snippets
Invitation Emails for All pilots
Mobile STEP Platform in Android and iOS
Extended Machine Translation & Text to Speech support
Enhanced Social Media Mining and Monitoring
Visualizations of Social Media Results
User Feedback Channels
User Tutorials and Pilot Administrator Tutorials
Admin Dashboard & Statistics
Multilanguage support in Mobile Channels

3.1.3 Features for Public Authority Users

A Public Authority (PA) user can be either admin or analyst. PA admin is the administrator of the local platform and has all rights. PA analysts have instead limited rights compared to the admins. Analysts don’t have rights for the following:

- Create dialogues
- Create conversations and round table dialogues
- Full access to social media monitoring tool and admin panel

3.1.3.1 General management

PA admin has access to the admin panel where she/ he can manage various aspects of the platform. In particular, dialogues, participants, admin profile, municipality profile, email templates, etc. are managed through the admin panel.
3.1.3.2 Dialogue management

Dialogue is a general term for a Citizen engagement activity/project. PA admins are able to set up dialogues about issues that have environmental impacts. There are three dialogue types: e-petition, observation and idea dialogues.

- **E-petition dialogue** is created to obtain young citizen’s suggestions and petitions.
- **Observation dialogue** is created to allow young citizens to share what they observe in their surrounding environment.
- **Idea dialogue** is created in order to gather ideas from young citizens.

![Figure 14 Dialogue types in the platform](image)

![Figure 15 An example of e-petition dialogue page](image)
PA admin can invite participants to the dialogues using their emails and she/he assigns roles to users. There are four types of roles for dialogues which are citizen, PA analyst, PA admin and dialogue admin. Analysts can also invite participants if admin gives them the required rights.

![Figure 16 Inviting participants to the dialogues](image1)

There are different options available for dialogues. PA admin is able to create public dialogues which is open to everyone, and private dialogues which is open to invited participants only. Since unregistered users have some rights, PA admin can choose if registration is required or not. Users need to provide full name, postal address, age and gender prior to submit or sign their posts. With an SMS verification option extended validation of users can be provided. Furthermore, PA admin is able to monitor incoming posts. If this option is selected, user’s posts is not be published without confirmation.

![Figure 17 SMS verification](image2)
3.1.3.3 Posts management

PA admin is able to create posts under dialogues. These posts are called differently according to dialogue types. Posts are called as petitions in e-petition dialogue, as observations in observation dialogue and as ideas in idea dialogue. Images, videos, sound files, locations or Youtube links can be added to posts.
PA admin handles incoming posts by tagging and sorting, editing, copying and moving to other dialogues. In addition, posts can be shared with social media (Facebook, Twitter, Linkedin, Google+) to inform citizens and get support. PA users can support petitions by signing them. Feedback is given by leaving comments to posts; also PA users can send private comments to post owners to give private feedback. Both admin and analyst can evaluate posts by ranking them on a scale from 0 to 10.
Figure 22 Signing, commenting and rating petitions

Posts can be viewed in different view modes which are portrait, landscape, wide and map views. In addition, it is possible to create posts in a map view by selecting a specific location on the map.

Figure 23 Different view modes
3.1.3.4 Analysis of dialogues

PA users are able to analyse dialogues. Analysis of the dialogues shows how many posts have been made, how many of them are rated and commented on by admins and analysts. Graphical views of posts that have been made over time are presented in the platform in the analysis section.

3.1.3.5 Conversation and round table management

PA admin is able to create interactive conversations with selected dialogue participants. In addition, she/he can create virtual round table dialogues to discuss a specific issue with 5-10 selected participants.
D3.3: Platform and Component Adaptations

3.1.3.6 Widgets

Widgets are quick feedback and chat channels for your citizens. Widgets are created through the admin side by city administrators. Widgets are shown in the municipality home page to users and they are allowed to chat and comment on the topic in discussion easily (Figure 27). Widgets may have different languages, background and text colors, specific titles and reached either via registration or publicly available with introduction and welcome messages or with direct chatting interfaces in different sizes. Also mood feature allows users to select their moods easily via emojis.
3.1.3.7 Embeddable Snippets

There are different ways of using STEP platform for citizen engagement and co-creation processes. Either cities use the web or mobile parts of the platform or they share dialogues through social media and allow users to join the platform. Another way of accessing and reaching the community is to embed STEP dialogue or content into the municipalities existing web pages. Considering that citizens are reaching municipal web sites frequently, by allowing them to see posts, questionnaires, replying posts enables more users to use the platform. Citizens are allowed to create posts, lists posts, use timeline and questionnaire via code snippets such as below. The only thing a city administrator should do is to list the snippets on the dialogue (Figure 28) and copy and share the example code below with the web site administrator or insert into the municipality web if they use a content editor or a web management tool easily.

![Figure 28 Code Snippets](https://step.green/challenge/9121?3b91fe12-7877-4612-8f53-45c18d329da4=)

3.1.3.8 Questionnaire Management

Based on pilot cities requests, STEP platform is updated with a questionnaire management component. This component enables city administrations to create either standalone questionnaires or questionnaires linked with dialogues as the first step to enter dialogues and co-creation phases.

Questionnaires support information providing items like info texts, Youtube introductory videos, single answer questions, multiple choice questions, ranking/sorting based questions and grading. Questions can be linked to each other to provide a sequence of items even separated by pages and automatic showing of answers in bar charts to the users of the STEP platform. The features of the questionnaire module are given in Figure 29 and Figure 30.
Questionnaire also provides detailed statistics on the results of users answers. City administrators can see cross tabulated answers or even create charts on their questionnaire answers.
3.1.3.9 Report and newsletter management

Reports can be created and published within the platform to inform users about the results of the dialogues. In addition, these reports can be extracted as PDF and PAs can use them for the decision making procedures.
Another document that can be created in the platform is the newsletter. PA admin can create and publish newsletters to present information and news about dialogues. In addition, subscription lists can be created for newsletters.

**Figure 33 Creating reports**

**Figure 34 Creating newsletters**
**3.1.3.10 Gamification**

Young citizens are motivated through gamification techniques via leaderboards, badges and rating of posts. Young people are encouraged to participate and develop their profile. Users gain points by participating in dialogues, creating, signing and commenting on posts. Then, the leaderboard is build according to the points gained and badges are awarded. Therefore, it is possible to see individual contributions and to provide motivation for active participation of young citizens.

Leaderboard

![Figure 35 Leaderboard](image)

Gamified greetings

To make participants feel welcomed and included we have added Gamification messages where Municipality Admins can define different type of greetings and welcome back messages further to the events of

- Just joined
- 1st re-visit
- 2nd re-visit
- etc..
D3.3: Platform and Component Adaptations

Badges

Users can be given new and updated badges as they grow and participate in new dialogues. We have a simple interface for this where Administrators can adjust badge names, descriptions and icons/illustrations for users in different roles.

Based on the recommendations on D5.2 and user experiences through interviews, STEP consortium has identified some steps to improve gamification experiences as follows:
Ensure transparency of the points system. Make it clearer how users are allocated points for Dialogues & their profiles (Dialogue & Profile Scores)

- The scoring is calculated as follows:
  - If user has a citizen role:
    - Write and share a petition, 2 points
    - Write and share an idea, 2 points
    - Write and report a problem, 2 points
  - If user has an analyst role:
    - Write and share a petition, 1 points
    - Write and share an idea, 1 points
    - Write and report a problem, 1 points
  - Dialogue score is collected for the activities of users in the specified dialogue and their profile scores are calculated over all of the activities on the platform. By this way, users and pilot administrations are able to see who is active in which dialogue and generally on the platform.
  - Also in the future plans of STEP, allow for customization of the points structure, e.g. give points for getting likes and comments will take place.

Leaderboard: Make the leaderboard visible if it is currently hidden on the dialogues.

- Allow PA admins to either show or hide leaderboards based on their expectations.

Leaderboard: Ideally reduce (or hide) the points given to the Public Officers.

- By the nature of their active involvement with the dialogues they almost always appear at the top of the leaderboard. Public administrators' scores are suggested to be reset based on this recommendation.

Utilise the points mechanism/gamification to allow the most active users of the Platform to have greater admin rights, for example – once they reach a certain level they will be able to create their own dialogue on the platform.

- One of the aims of the project to promote youth leadership and empowerment, and this mechanism would give the young people really engaging with the platform an opportunity to have more of a bottom-up approach to e-Participation. For this purpose, STEP created a future plan to provide the mechanism for most active users to jump to a higher level where they will get rights as admin to create dialogues on their own.
3.1.3.11 City Administration & Dashboard

City administrations manage their accounts through the administrative features of the admin interface. PA admin is able to manage all reports, dialogues, users, municipality profile, email templates, invitation emails and even translations from this administrative menu (Figure 40 and Figure 41). Admin also has several
tutorials and videos on how to use administrative features of STEP admin parts that are accessible through the menu also (Figure 42).
3.1.3.12 Social media mining & visualisation

PA admin is able to reach enriched information about emerging topics which are currently trending in social media and the web by capturing automated spottings. In addition, she/he is able to gain valuable insights from citizens contributed contents from social media/web via the social media monitoring tool. The visualisation tool provides an analysis of the collections created. The social media mining and visualisation feature is explained in detail in the Chapter 3.3.

3.1.4 Features for Young Citizens

Young citizens are called ‘creator’ if they are registered to the platform and ‘rookie’ if not registered to the platform. Users can register to the STEP platform by providing name, e-mail address, gender and year of birth; however unregistered users are welcome with limited rights. Users may also use their social media accounts (Facebook, Twitter, LinkedIn, Google+) to login.
Young citizens use the STEP platform to express their ideas and opinions, to show their observations, and hence to be actively engaged in decision-making processes of PAs. Young citizens are able to view and join public dialogues. They can also join private dialogues via invitations received from PA admins.
D3.3: Platform and Component Adaptations

Once young citizens have joined in a dialogue, they are able to create posts under this dialogue. According to the dialogue settings, they may be able to create posts without joining the dialogue and even without registering to the platform.

They can share posts through social media (Facebook, Twitter, LinkedIn, Google+) to get support for their posts.

Young citizens are able to see other posts under dialogues and this helps them see other people’s thoughts and suggestions. They can discuss petitions, ideas and observations by leaving comments. Young citizens can sign other users’ petitions to support them, which means that she/he agrees with the proposed petition.
Posts can be viewed in different view modes; portrait, landscape, wide and map. Young citizens are able to create posts in map view by selecting a specific location on the map.

Young citizens are able to join conversations that have been created under dialogues by PA admins. Therefore, it is possible to engage users in real-time conversations (chats) with administrators, other local PA representatives (analysts) and other local citizens. Young citizens can also join round table discussions created about a specific topic by PA admins.
Native mobile applications of the STEP platform support iOS and Android operating systems that allow STEP to run on most of the available mobile devices in different sizes. The mobile applications provide easy and user-friendly access to public authorities included in the platform, their dialogues and challenges in different views.

The easiest way to reach and download the platform from App Store and Google Play Store is to search with “step.green” keywords. After loading all the content, STEP Mobile allows you to login via your email/password or register by creating a user on the platform or by logging via users existing social media accounts (Facebook, and Twitter). First thing to do is to select the city you live or are interested in or to go to STEP dialogues directly. STEP Mobile apps are available in platform supported languages (Greek, Turkish, Catalan, Spanish, Italian, and English). After selecting your municipality, you can easily access the active dialogues that the user is involved in and available other dialogues of the public authority. You can get brief info, post to each dialogue, answer questionnaires or see the leaderboard of the dialogue and be an active member of all dialogues of your city.

Some features of the mobile application are as follows;

Figure 49 Joining round table discussions

Since language barriers are removed in the STEP platform via the machine translation component, users are able to reach and understand dialogues in other languages. Text to speech feature is available for English, Turkish, Spanish, Italian, Greek, Catalan, and Swedish. These features are explained in detail in Section 3.4.

Young citizens are able to reach enriched information about emerging topics which are currently trending in social media and the web according to their interests via the integrated social media mining tool. Detailed information about this feature is given in Social Media Mining and Monitoring section.

3.2 Mobile STEP Platform

Native mobile applications of the STEP platform support iOS and Android operating systems that allow STEP to run on most of the available mobile devices in different sizes. The mobile applications provide easy and user-friendly access to public authorities included in the platform, their dialogues and challenges in different views.

The easiest way to reach and download the platform from App Store and Google Play Store is to search with “step.green” keywords. After loading all the content, STEP Mobile allows you to login via your email/password or register by creating a user on the platform or by logging via users existing social media accounts (Facebook, and Twitter). First thing to do is to select the city you live or are interested in or to go to STEP dialogues directly. STEP Mobile apps are available in platform supported languages (Greek, Turkish, Catalan, Spanish, Italian, and English). After selecting your municipality, you can easily access the active dialogues that the user is involved in and available other dialogues of the public authority. You can get brief info, post to each dialogue, answer questionnaires or see the leaderboard of the dialogue and be an active member of all dialogues of your city.

Some features of the mobile application are as follows;
D3.3: Platform and Component Adaptations

- Available in both platforms (iOS and Android)
- Easy Registration, Login via either Email or Social Media Accounts
- Supports all STEP languages
- Either Select Your City/Municipality or Reach to all available STEP dialogues
- Landing page per city (My Dialogues/Available Dialogues) with popularity statistics
- Dialogue Pages for accessing posts/ideations, questionnaires, dialogue brief, leaderboard of the members of the dialogue, notifications and sharing capabilities
- Access dialogue content in your own language via machine translation and text to speech
- New Ideation/Post management under dialogues with image, video, sound file, location or YouTube film
- User profile management

Figure 50 Sample STEP mobile interfaces
3.3 Social Media Mining and Visualization Component

This component is based on the social media mining tool that was presented in deliverable D3.1: “Architecture and Integration Framework Definition Specification”. During the second period of the project, the tool was considerably refined and extended following a continuous interaction process with the pilot partners. The new developments concerned both improvements of performance (e.g. bug fixes and faster response times), improvements of usability and new feature additions that were seen as necessary following the careful study of user requirements and the feedback obtained from pilot partners. A detailed account of the implemented improvements and the outcomes that are possible thanks to them are presented in deliverable D4.4: “Adaptations to social media monitoring tool”. Here, we present a limited overview of these additions, with an emphasis on the integration of the tool with the STEP platform.

Two main views of the tool have been integrated in the STEP platform:

a) Full view: This is the full version of the tool allowing authorities to plan their environmental campaigns, monitor interesting environmental issues, and analyse results using the tool’s dashboard, feed and visualisations. Only PA admin accounts have access to full view of the tool.

b) Reduced view: This is a reduced version of the tool which is integrated in the STEP platform allowing citizens to declare their topics of interest and receive relevant content items from social media. These can be consequently used as regular content items in the context of the e-participation component. Other users except PA admin have access to the reduced view.

Seen as a STEP component, the social media mining and visualization tool is a web application that enables users to discover how content is shared in Online Social Networks. It covers the most popular social media sharing platforms, namely Facebook, Twitter, Google+, YouTube, and Flickr. In addition, to Social Networks, the application also supports RSS Feeds. The component continuously collects information around target entities provided by PA users or young citizens. Furthermore it monitors the content posted by manually defined and related social media accounts.

3.3.1 Full view of the tool

PA admin accounts have access to the full view of the social media mining tool from the STEP Platform as shown in Figure 51.

![Figure 51 Reaching social media mining tool](image)

The component consists of three main parts, namely the input, feed and dashboard.
D3.3: Platform and Component Adaptations

**Input:** This part allows PA admin users to create several collections; each one linked to a topic/issue of interest of their choice. To initiate a collection, users must define a set of keywords/hashtag and/or a set of user profiles, across Social Networks, all relevant to the topic of interest (Figure 54). Once the user has launched a collection, they can inspect all the gathered information in two primary sections: the Feed and the Dashboard.

**Updates on Input Section:**

- **Logical Operators:** The end user can create logical expressions (Figure 52), using the logical operators AND, OR, NOT, consisting of keywords to provide more specific content collection rules (e.g. exclude certain keywords from the collected content).
- **Geolocated Input:** The end user can define areas (as polygons) on the map for fetching geolocated content inside a bounding box (Figure 53).

![Figure 52 Create Logical Expressions](image)

![Figure 53 Design bounding boxes on map](image)

![Figure 54 Input in social media mining tool](image)
**D3.3: Platform and Component Adaptations**

**Feed:** The Feed presents the latest media items collected around the topic in real-time. The component fetches all relevant media content, photos, videos and posts, seconds to minutes after they are published. Each item contains all the information that comes along with the post such as time, user and Social Network. A number of filters and sorting criteria are available so that the feed can be customized to the needs of the end user. In more detail, the following filters are available:

- **Social Network:** Define the source of posts
- **Language:** Define the language of posts
- **Topics:** Define the topic automatically detected by a topic detection algorithm
- **Original:** Define whether the post is shared/retrieved or original
- **Type:** Define whether the post contains multimedia content or just text
- **Date:** Define a specific time window

In addition, it is possible for users to sort content items according to the following criteria:

- **Recent:** The most recent posts come up
- **Popularity:** The most shared posts come up
- **Relevance:** The most relevant posts come up

The user can also search for media based on keywords inside the collection.

**Updates on Filters:**

Two additional filters were added in the left panel of both feed and dashboard view:

- **Unique:** Added "Unique" filter with values "True/False" that can be used to eliminate duplicate (almost identical in terms of text) content on Feed.
- **Concepts:** A set of predefined concepts related to environments issues. Upon selection of that filter, only items related to the specific concept remain in the view.

**Updates on Feed:**

- **List View:** Added "List View". The feed can be presented as a table that can be sorted based on columns User, Text, Date, Source, Popularity and Relevance. Data can also be exported to .xls or .csv files.
- **Rating:** The end user can rate individual posts on a scale of 1 to 5, where 1 means that the user finds the particular item irrelevant and 5 relevant.
- **Exclusion:** Irrelevant profiles and all of their posted content can be excluded. In the same way, individual posts that are found by the user to be irrelevant can be excluded also.
- **Translation:** The Linguatec API has been integrated. Posts can be translated on demand from the pilot's language to English and vice versa.
D3.3: Platform and Component Adaptations

Dashboard: This section offers a variety of metrics and widgets that offer summary views and analytics over the collected data, enabling users to gain meaningful insights about the entity (e.g. persons, organizations, and tags identified in the text of the collected items) of interest. The visualizations are interactive and allow users to inspect the media that are behind these statistics.

Updates on Dashboard:

- Exclusion: From "Active Users" and "Entities" widgets users can exclude any profile or tag respectively that find irrelevant to the collection (Figure 57).
New pilot specific UI:

A new dedicated dashboard page (Figure 58) per pilot was created, containing one collection for every active dialogue, presenting all the data in a much more intuitive and accessible way.
Figure 58 Pilot specific UI
### 3.3.2 Reduced view of the tool

Since this is a reduced view of the component integrated into the STEP platform, all users are able to reach the tool from their personal pages (Figure 59). Users are able to capture trending topics matching their interests, which are defined based on selected keywords (Figure 60).

*Figure 59 Social media mining tool for citizens*

*Figure 60 Capturing automated trendspottings*
### 3.4 Machine Translation and Text to Speech

The Machine Translation (MT) systems for the language pairs English - Spanish, English - Italian and English – Greek were built in Period 1. In Period 2, the MT quality for the above languages has been improved and Catalan and Turkish have been added as additional languages. As a result, the following language pairs are supported:

![MT component language pairs](image)

#### 3.4.1 State of the art

In the beginning, machine translation systems followed a simple substitution of words from one language by the corresponding words in another language. This approach, however, has not lead to good translation results. It became clear that the translation requires not only a lexicon (words and their translations) but rather a profound knowledge of specific structures in the source language and a way to generate corresponding structures in the target language. Two main approaches to achieve this have been developed:

- **Data-driven**: based on automatic corpus analysis and statistical learning methods, where both translations and the rules are learned from a sufficient amount of bilingual corpora, i.e. from existing translations (SMT = Statistical MT). This approach has been taken for the language pairs English - Spanish, English - Italian and English – Greek.
- **Knowledge-driven**: based on exploiting the expert experience of lexicographers and linguists, who write lexicons and grammar rules manually, founded on their own knowledge (RBMT = rule-based machine translation). This approach was selected for the language pairs Catalan – English and Turkish – English.

The field of machine translation is characterised by a strong dominance of the statistical techniques. The most important prerequisite for the development of probabilistic-based systems is the availability of parallel

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1. English is used as interlingua language to support all language directions.
corpora, i.e. of texts in two or more languages that are perfect (human) translations of each other. Several open SMT tools exist that offer software for training, tuning and decoding tasks. One of the widely used ones is Moses, a toolkit originally developed by Philipp Koehn at the University of Edinburgh, and continuously improved and further developed by a growing number of researchers all over the world.

### 3.4.2 Technical framework and approach

In the STEP project, the SMT approach has been adopted for the language pairs for those language pairs where sufficient parallels text corpora were available. Since the Moses framework is a language-independent platform, it has been used for the development of all statistical MT pairs. For the translation model the phrase-based model has been taken. This is the “standard” and most widely used approach. Instead of learning the translation word by word, larger word sequences (currently, up to 7 words) are being taken into account. Thus, larger contexts, different word orders in source and target, as well as distant dependencies are considered. The development of the MT systems comprised the following components:

- Training component for translation models (bilingual phrase tables) and for reordering models (bilingual “rules” how to deal with different word orders in source and target language).
- Tuning component for better adjusting the translation parameters according to the given domain or text genre; it is based on an extra set of human translations that is representative for the intended translation task in terms of vocabulary and style.
- Decoding component with powerful search algorithms that computes all possible translation hypotheses and finds the translation with the highest probability.
- Support for externally estimated LMs and integration of LM tools (SRILM, IRSTLM etc.), as well as already integrated LM software (KenLM, RandLM).
- Work-flow control tool (EMS = experiment management system), which enables the user to automate the whole training-tuning-evaluation chain; it offers a graphical interface to follow the progress of each step visually.

For the EU languages, there are large bilingual corpora available such as DCEP\(^2\) and Translation Memories from the European Union’s DG EAC\(^3\). For Catalan and Turkish language there was no access to sufficiently large bilingual corpora required for training a statistical MT system. For these languages therefore the API and resources provided by the former EU project iTranslate have been used.

The Text-to-Speech component has been implemented with broad functionalities to allow flexible access from the STEP platform. Supported languages are Catalan, English (British and American), Greek, Italian, Spanish, Turkish, and Swedish. It can convert any text into an audio file. Both WAV and MP3 format are supported. The following voice parameters can be specified:

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\(^2\) Digital Corpus of the European Parliament
\(^3\) Directorate General for Education and Culture
D3.3: Platform and Component Adaptations

- Speed
- Pitch
- Volume
- Male or female voice for each language

In period 2 the Text-to-Speech component has been updated with newly developed voices which offer a significantly more natural and accurate pronunciation.

![Image of translation tool]

**Figure 62 Machine translation & text to speech**

Users are able to see platform inputs (dialogues and posts) in their local languages due to the translation tools. The MT tool allows users to access content from other countries in their own language. There are translation icons in the dialogues and petitions that opens the translation machine. Translation of dialogues and posts English to/from Spanish, and Italian is presently available. Greek, Turkish and Catalan is demanding more advanced strategies to be solved. During period 2, the focus was on the reduction of noise in the corpus, retraining, and also modifying the translation parameters accordingly. Improved results in translation have been achieved with regards to the following issues:

- Better homogenisation of the training corpus
- Reduction of the amount of unknown words
- Tuning of the model parameters for better translation quality

**3.4.3 Improvements in MT quality**

In period 2 the emphasis was on improving system stability and MT quality, in particular for the statistical language pairs. The manual inspection and error analysis of baseline translations have shown that the error sources occur on different levels, some caused by noisiness in the training corpus, some more complex and demanding more advanced strategies to be solved. During period 2, the focus was on the reduction of noise in the corpus, retraining, and also modifying the translation parameters accordingly. Improved results in translation have been achieved with regards to the following issues:
3.4.3.1 Data homogenisation

The error analysis had revealed a couple of errors in baseline systems which could be fixed by homogenisation and normalisation of data originating from different sources, as well as homogenisation of training/tuning/testing datasets. In particular, the translation quality could be improved through measures such as the following:

- Consistent general truecasing in all corpora: For the baseline systems the approach was taken to truecase only the sentence beginnings, but not to touch the body of the sentences. However, texts contain capitalised words also within the sentences, which leads to an unnecessarily high number of different tokens (the, The) and their contexts. This has been changed for the current version.
- Reduction of spelling variants to one “standard term”, e.g.: double quotes (“‘“,” “‘‘“”), same words with or without hyphen in English, old/new orthography in German etc.
- Consistent tokenisation of e.g. contractions (it’s) and web-addresses.

3.4.3.2 Reduction of unknown words

Translation quality can be strongly impacted by unknown words. Missing translations for single words or phrases can substantially determine the translation of the surrounding words and thus of the entire sentence context.

In experiments, two different types of unknown words in the translation were observed: The first ones are words that have not been seen in the source part of the training corpus at all, and as such they cannot have any corresponding translations in the target language. The second type, which is more difficult to trace, are words that occurred in the training corpus, but the word and phrase alignment components only were able to find translations for them as part of bigger phrases, but not as single words and consequently not in other contexts.

In the first case, it was decided not to train the models again, but to enrich the phrase tables by adding translations for unknown words to them. Since these words were not existent in the phrase tables at all, they could simply be added with a default weight, equal for all of them. This helped to reduce OOV problem substantially. The evaluators’ subjective impression was that the translation is much better than before, even if the gain in the translation quality measured automatically was relatively low. Important shortcomings of this approach are, however, the lack of the context information and missing inflected forms for the imported translations.

In the second case, the unknown words have been seen in the training corpus, and as such they are part of some bigger (weighted) phrases, but however, the system was not able to automatically discover and learn single translations for them. Since in this case a manual manipulation of the phrase tables was not an option (there exist weighted phrases containing these words), we decided to retrain the models and to try to influence the alignment process. For this, multiple single lexicon entries and also many selected, very short and simple expressions and sentences from available translation memories were added to the training corpus. In this way, by adding simple and unambiguous lexical translations to the training corpus, many correct single word alignments could be learned already during the initial alignment iteration, which increased the overall word and phrase alignment quality. Later experiments have shown that this approach can also be applied to the first type of unknown words with very similar results as the approach described above.
3.4.3.3 Tuning for quality

A machine translation system is composed of several statistical models, such as bilingual translation models, reordering models, and monolingual language models. After the training, all of them are used with equal weights in the translation process. By tuning and optimising their weights, the translation has been customised and improved for specific translation requirements as in the STEP domain. For this, a trained system has been tuned by translating a representative dataset in several iterative testing and adjusting cycles, in order to reassess the parameters for the respective purpose (Bertoldi et al., 2009). The tuning dataset, also called development set, can be a relatively small parallel corpus, but it should be as domain and application-specific as possible. Our experiments have shown that already tuning with very small datasets can be a very effective means for domain adaptation, in particular if the available in-domain data are too sparse for a domain-adaptive retraining of the whole system.


### 3.5 Data Logging Component

The logging component is developed to be used for the evaluation of user-system interactions by logging both user actions and system events. It is designed as a REST web service and its communication is handled with JSON format. Logged data can be broken down by relevant categories like age, gender, etc. and is be used for the evaluation of user-system interactions.

STEP uses anonymous aggregation of user choices and interface accessing. This gives an accurate log of how users actually use the system. This data log informs about the following:

- The level of usage of the different parts of the software.
- Use (timing, type, level) of system elements.
- Level of usage of User Interface elements (which buttons, sliders, etc. are pressed, when and how often).

#### 3.5.1 Main features of the component

The Data Logging system keeps the data about user-system interactions and system events. This component tracks each process of the user and covers the following: user profile management, visited pages, visited profiles, visited topics, comment and content operations and joining chat rooms. All interaction events in the STEP Platform are logged in the system. The Logging component also provides interfaces for all other modules to log their system events through several processes. Main Features of data logging component are as follows:

- Logging user activities such as membership, visits, and challenges.
- Storing these data in a way that can be interpreted as meaningful information and can be reported in various ways.

Logging efforts have value and are important for several reasons. In addition to supporting audits of selected system activity, security measures, and controls, a logging program can also help to resolve operational problems and contribute valuable information to security incident investigations. The Data Logging Component provides tracking user-system interactions. The system can report and show graphics to user for the following via log table data:

- Last logged
- Last changed password time
- Tracking logged IPs.
- Visited challenges
- Searched texts

The data logging system kept data about user-system interactions during the piloting period. The system tracked each user process The outcomes of the statistics collected are being reported in the final evaluation report. This report contains usage statistics for main features of the platform according to pilots usage including number of dialogues created on the platform, number of posts, post that are geolocated with coordinates, dialogues that has questionnaire, the number of questions raised and answers received per pilot, number of timelines created, chats and roundtables created and widgets counts.
Conclusion

D3.3: Platform and Component Adaptations deliverable presented detailed information for the platform that have been delivered during the piloting period of the project. The main goal of the deliverable is to define the updated and final version of the integrated and tested STEP platform after piloting periods and to describe main features of the platform and each component, which are e-participation component, social media mining & visualization component, machine translation & text to speech component and data logging component.

Since the platform features have been presented in detail from end user perspective by providing related user interfaces, the deliverable has provided an overview about the usage of the platform for end users. Features of the STEP platform have been described according to the following aspects;

- Step.green Features
- Features for Public Authority users
- Features for Young Citizens
- Localization of the STEP platform
- Mobile applications of the STEP platform
- Social Media Mining & Visualization
- Machine Translation & Text to Speech
- Data Logging

With a continuous interaction process with pilot partners, STEP platform evolved in the second and piloting period. After handling hundreds of requests/issues from pilot partners, STEP platform increased the level of features provided to municipalities and citizens. Some of the main features provided during the piloting period are:

- Questionnaire Management
- Map View, Widgets & Code Snippets
- Mobile STEP Platform in Android and iOS
- Extended Machine Translation & Text to Speech support
- Enhanced Social Media Mining and Monitoring
- Visualizations of Social Media Results
- User Feedback Channels
- User Tutorials and Pilot Administrator Tutorials
- Admin Dashboard & Statistics

Within an effective piloting period, STEP platform a more useful and more user friendly tool and platform for the aims and uses of the pilot partners and all of the pilot cities have provided several dialogues and questionnaires using platforms capabilities.

The outcome of this deliverable also is also a reference for pilot partners and other city administrators that would like to use STEP platform for engagement and co-creation processes.