



Towards We-Government: Collective and participative approaches for
addressing local policy challenges
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Consolidated conceptual & methodological framework v1

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Executive Summary

This document details operational specifications of concept, methods and procedures to be applied for the purposes of the WeGovNow project in relation to research & innovation aspects, usability and e-accessibility aspects as well as legal, data protection and ethical aspects. The purpose of this deliverable is to ensure a truly common understanding of the project's conceptual and methodological approach across the multi-disciplinary project consortium, with a focus on consolidating the conceptual planning of the overall WeGovNow platform. The

consolidated framework will help in ensuring exploitability of project outcomes by relevant stakeholders beyond the immediate project duration. This document covers the early conceptual phase of WP1 that will feed all subsequent WPs in terms of consolidated descriptions of concepts and methods to be applied.

This document covers the first phase of the project and will be followed by an updated version in M12 to take account of possible adaptations according to the development progress and pilot site's needs, thus making this a living document during the lifecycle of WP1.

1 Introduction

This document is structured in 4 main sections.

Chapter 2 deals with the initial conceptual architectural design of the overall WeGovNow ecosystem and an early attempt to present how the final system is envisaged from the end-users' point of view. This is achieved by providing various mock-ups. Moreover, the core components are explained in detail and a set of 14 questions are answered for each one so as to act as reference point to the IT departments of the pilot sites and to also make clear what are their features and technologies used. We also present some must-have non-functional requirements that have been decided by the consortium to be applied to every structural block of the platform in order to meet the highest standards.

Chapter 3 concerns the methodological framework and describes the agile approach to be followed through the project lifecycles. Scrum methodology is suitable for WeGovNow and details are given in terms of sprint sections and collaboration actions between the members of the consortium. The interoperability framework is analysed in detail in technical, semantic and organisational manner.

Chapter 4 is about User Issues such as applying the widely accepted "Design for All" principle in WeGovNow from the very early stages of the development. The accessibility requirements and the user-centred design are explained along with the evaluation of the system. The latter will be achieved through close collaboration with the local stakeholders and citizens.

Chapter 5 deals with the legal, data protection and ethical standards. The legal requirements for processing of personal data are shortlisted and legal and ethical standards both at European and national levels are explained in order to make clear how they might affect future actions in WeGovNow and what further actions should be made in pilot municipalities, like terms of compliance with data protection and privacy law at national level for UK and Italy. Moreover, an initial approach on WeGovNow licensing is part of this section as well.

The appendix contains the accessibility lists of requirements both in regard of concept & design, and techniques in technical and pedagogical terms. These requirements are based on WCAG 2.0 but go significantly further in many areas, and also specify in detail how the Standard's requirements should be addressed during the duration of the project.

2 Conceptual framework

2.1 Initial architecture of the WeGovNow platform and how the system is envisaged

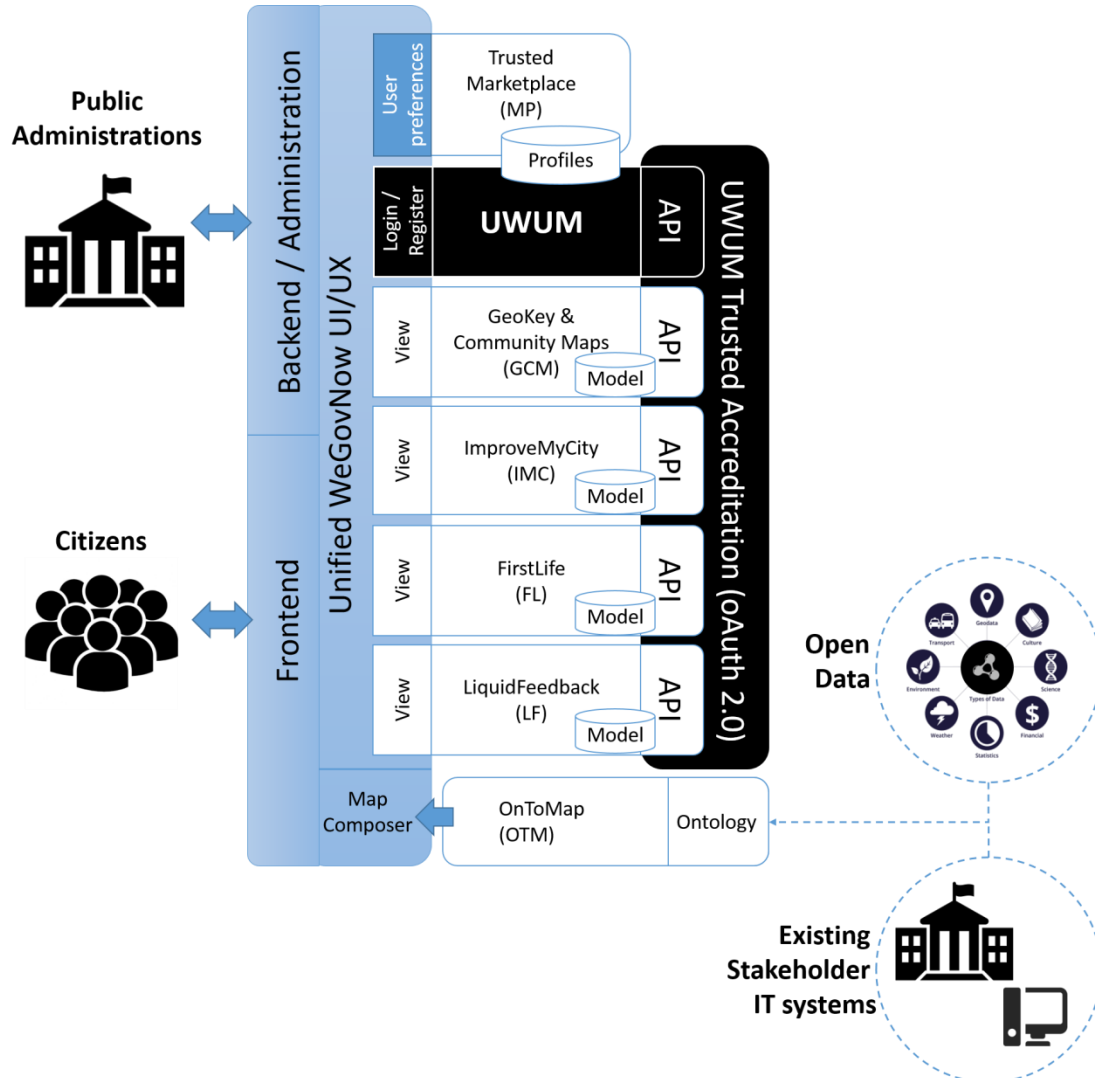
The WeGovNow platform is envisaged to be realised via a layered architecture which integrates the main core components of the system together with (a) a mechanism to orchestrate user management such as registration, single sign-on authentication, profile handling and in general trusted accreditation and (b) a mechanism to analyse user profiles and personal preferences and automatically suggest events or users with similar interests, etc.

In the conceptual overall architecture, the Unified WeGovNow User Management (UWUM) is introduced to act as the orchestrator of user management (login/registration, authentication). Exhibit 1 shows schematically the conceptual architecture together with the functionalities available to the users:

- **UWUM:** Functionalities concerning user registration, also using mainstream social networks accounts, and single sign-on. Since all components in the backend have been developed independently and are integrated into the platform, it is necessary to evolve the management of users with a single sign on procedure. This will be achieved by using mature and tested techniques such as OAuth 2.0.
- **Trusted Marketplace (MP):** Functionalities concerning i) suggestions of relative posts (issues/events, etc.) to registered users (through UWUM) based on their interests and ii) matching requests with offers (e.g. volunteers) of support or co-operation based on trust among the citizens by proposing solutions on how to satisfy their requests.
- **Map Composer:** Is considered part of the frontend and deals with functionalities concerning the interaction with the OpenStreetMap (OSM) interface, from community mapping to social networking, from the visualisation of information in the dashboard to the interaction with the (Point of Interest) POIs.
- **LiquidFeedback (LF):** Functionalities concerning opinion formation.
- **Firstlife (FL):** Functionalities connecting crowd and institutional information about the urban daily life.
- **ImproveMyCity (IMC):** Functionalities to allow citizens reporting daily issues (such as potholes) and public administrations to handle them in transparency.
- **GeoKey & Community Maps (GCM):** Functionalities to support constructing digital representations of physical space through participatory action.
- **OnToMap (OTM):** Functionalities concerning the management of a semantic knowledge representation layer which supports integration of heterogeneous

data and explicit representation of semantic relations between geographical data.

Exhibit 1: The overall conceptual architecture of the WeGovNow platform



The Unified WeGovNow UI/UX, that acts as the presentation layer, creates a unified interface for the citizens (frontend) and an administration unified interface for the public administrations (backend). The interface should be usable both on desktops and on mobile devices and should be based on standard open-source technologies. Concerning the map interface and other geo-referenced information mechanisms that play key role in WeGovNow, OpenStreetMap will be used. The frontend will be transformed in apps for different operative systems (Android and iOS) using the PhoneGap or similar frameworks, or by using native solutions (selection to be finalised in WP3). Different interfaces, which are however integrated and with homogeneous look and feel, will be offered for all the above sets of functionalities. The common look and feel will be orchestrated by UWUM (since it is also containing

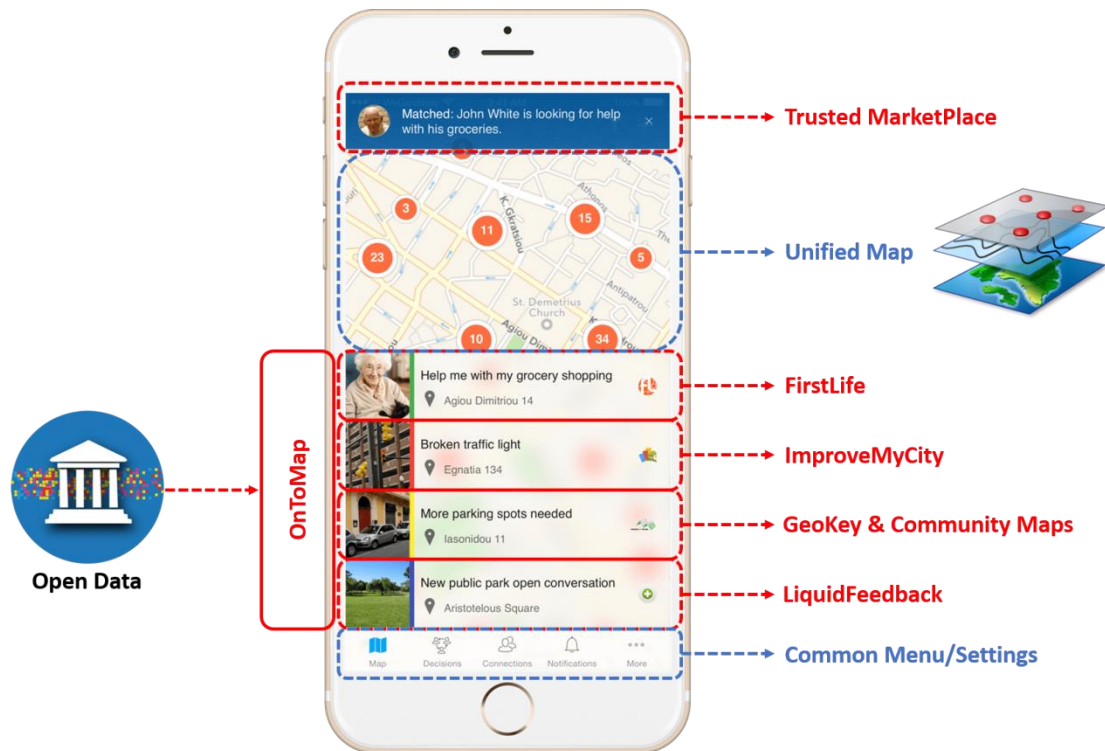
the logic for the single sign-on procedures thus making it easier to handle this as well) by providing the rules (CSS pre-processors or other) through its API.

Special consideration at the conceptual design phase is given to the connection and interlinking of WeGovNow platform with available open data and existing stakeholders' IT systems. It should be clear that our proposal does not replace pilot sites existing systems but instead it complements thus giving an added value to their solutions. As depicted in the diagram in Exhibit 1, the interconnection is achieved through OnToMap and its semantic representation of external data through a well-defined ontology. A real case scenario for the benefits of linking external open data is to include, for example, a map layer with bus stops or open pharmacies, etc. on top of the WeGovNow functionalities.

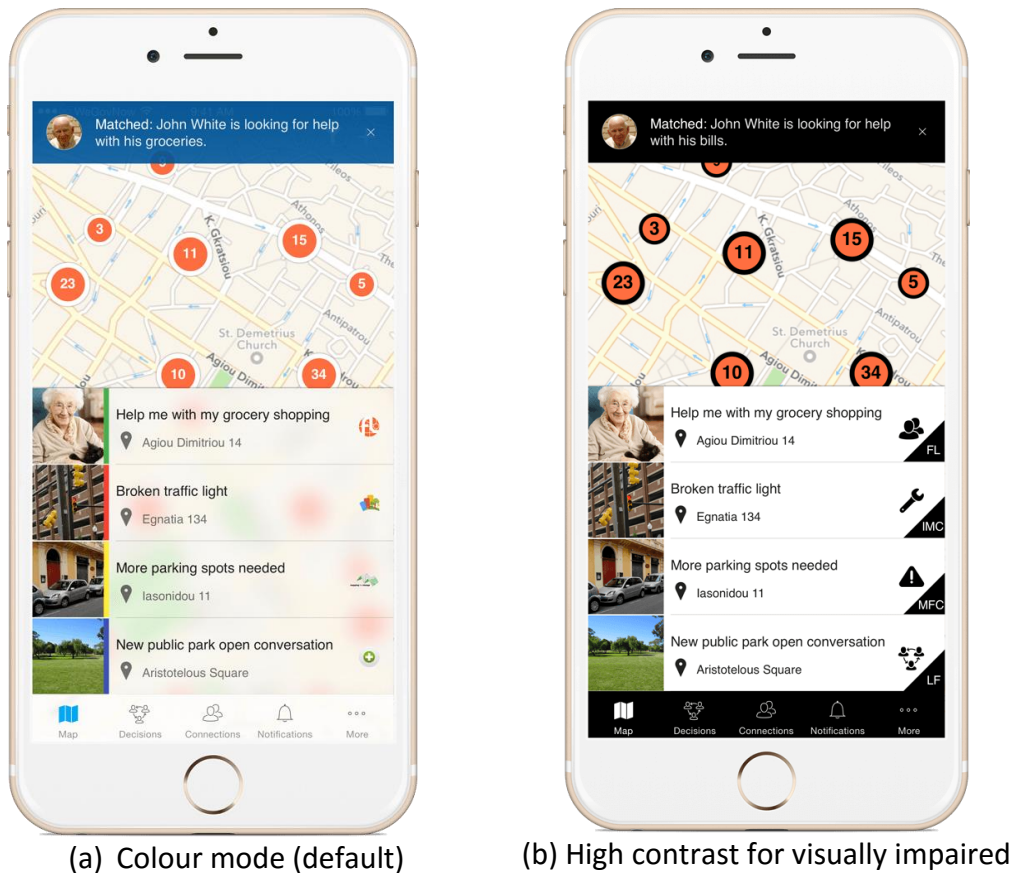
It should also be noted that although the diagram depicts a common profiles database between UWUM and MP to highlight their strong connection, in reality, there will be no shared database but there will be a logical link. In general, all models (data storage) of each core component will be autonomous and any bilateral data exchange among them will take place through their API. For that reason, special attention will be given to strong interactive documentation of the programming interface of each component.

The entry point is envisaged to be a map-based interface (Exhibit 2), where the information is displayed geographically as POI markers on the map. Clicking on a marker will forward the user to a single POI screen that describes the issue in detail (Exhibit 3), using the appropriate core component's API for receiving additional information regarding the action. For example, a marker on the map representing an issue submitted through Firstlife component will lead to a call at the Firstlife API so that details for this issue are fetched and presented in the specific screen. Using API calls the presentation layer (common UI) will interact with the business logic of the WeGovNow platform.

Exhibit 2: The WeGovNow entry point map-based mock-up (early envision)

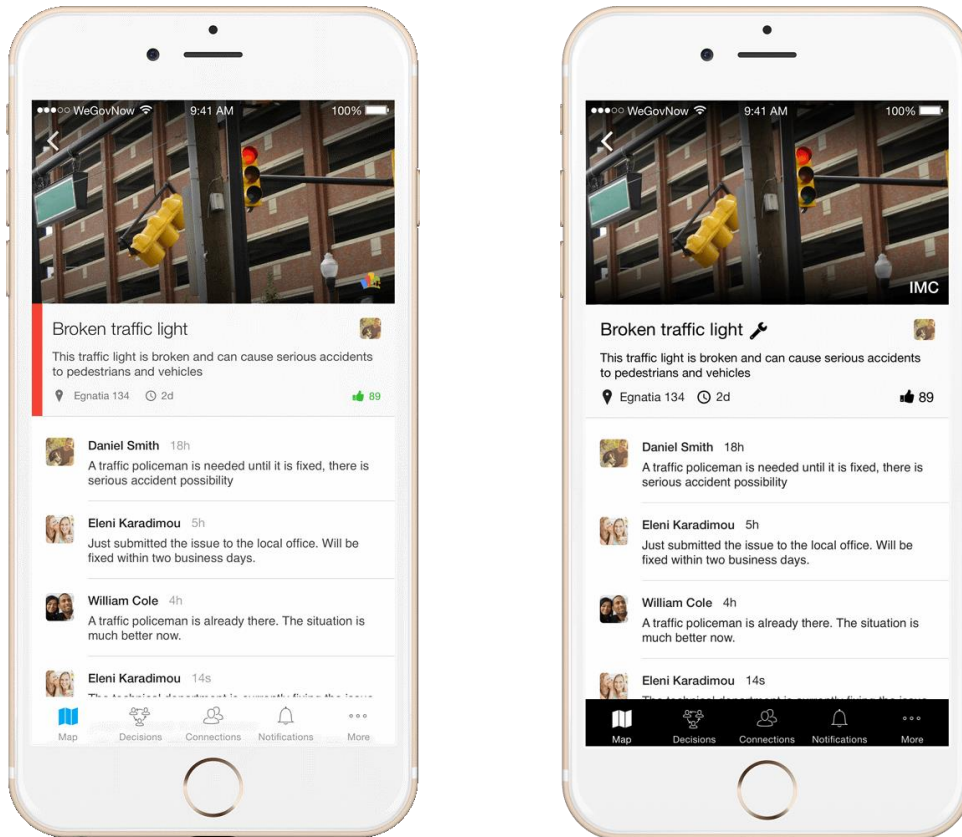


The mock-up screen shows at the top a sample Trusted Marketplace push notification. In this particular example, the user is interested in helping out people with daily tasks (as set in their profile) and gets notified that a nearby WeGovNow trusted user seeks help ("matching"). In the background (no UI), OnToMap is responsible to feed information either by available open data repositories or by existing stakeholder's IT systems.

Exhibit 3: Mock-up: Unified map/list view in colour and high contrast mode

The mock-up depicted above shows the entry point in two different display modes according to the user's profile. Trusted marketplace analyses the user profile and their personal preferences and suggests automatically a different viewing mode. For example, a visually impaired user could use the high-contrast mode. The changes are not only in colours but they might include icons instead of colour-bars, textual description instead of logos, etc. Later on, when the development will move forward, the layout itself might also be adapted. For example, the map could be hidden and the list will cover the whole screen, or the menu become sidebar, and so on. For discussion and accommodation of accessibility requirements, technical partners will collaborate closely with Funka Nu. It is noted that similar approach will be followed by the web-based version of the WeGovNow platform as well.

Exhibit 4: Mock-up: Issue detail view in colour and high contrast mode



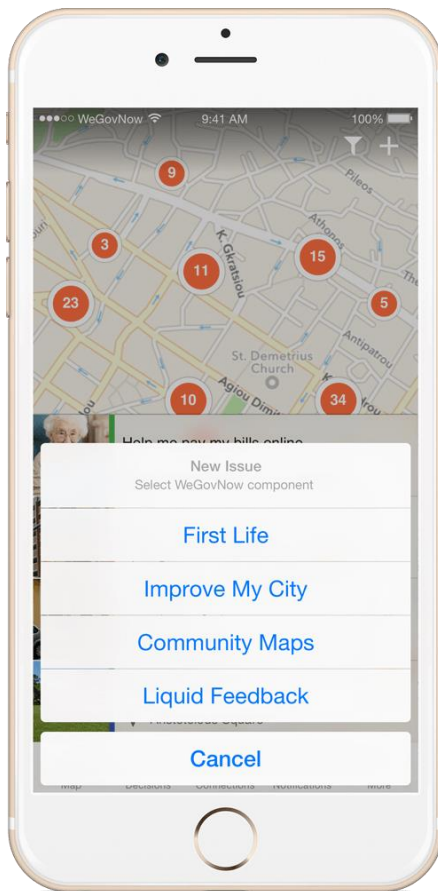
(a) Colour mode (default)

(b) High-contrast for visually impaired

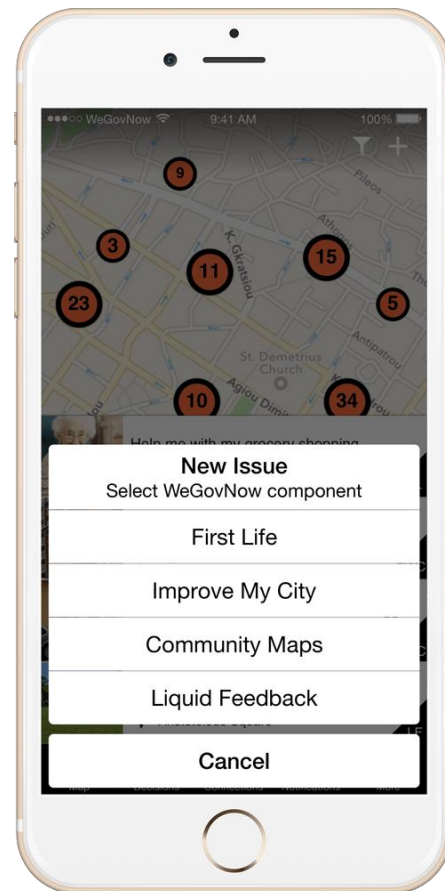
The issue detail view (Exhibit 4) presents additional information, including the date and location of a specific issue as well as its description. In addition, comments and feedback from the issue author are also included according to the post type.

The red coloured column on the left of the description characterizes this issue as a problem to be solved inside a conceptual segmentation of WeGovNow issues. For example, all opinion formation debates may be presented in yellow and all problems to be solved as red. Accordingly, in the visually impaired user's mode the colour codes are substituted by other means of identification. The detail view content and layout will depend on core components accordingly. In any case, though, the look and feel will be the same for every component. This common look is envisioned to be orchestrated by the UWUM module. The concept of doing this would be either by providing predefined SASS or LESS stylesheets or by setting basic colour schemes in JSON format (Technical details will be set in WP3, namely in UWUM specifications).

Exhibit 5: Mock-up: Adding new post/content in colour and high contrast mode



(a) Colour mode (default)



(b) High-contrast for visually impaired

When adding a new post (event, issue, area, discussion, voting, etc.), the interface, look and feel, and user experience, remains the same. Exhibit 5 shows the unified menu allowing users to select the kind of action they like to take. Note that the names of the menu items (*now names of core components*) will change to more meaningful titles (e.g. LiquidFeedback to become “New public discussion”, ImproveMyCity to become “Report a problem”, and so on). The concept still is to have one common gateway that remains fully transparent and perceived by the end-users as a single application so as to provide the best user experience.

2.2 WeGovNow core components

The individual core components, previously existing as well as new ones (e.g. Trusted Marketplace) that will be created specifically for the project from scratch, will be combined to compose the WeGovNow platform. An early phase demonstration of each core component took place in M1 online and also during the first physical meeting in London in M2. The purpose of the live demonstration and the accompanied presentations that circulated among the consortium has been to help everyone (and most importantly the three pilot sites) to:

- Understand clearly the features and details offered by each core component;
- Clarify how pilot sites can benefit from each component;
- Make clear what is the added value to combine all of them under a common umbrella;
- Realise the needs of the pilot sites and what other features could possibly be added or modified based on municipalities' needs, and also to get an early aspect from the pilots (non-technical) point of view about the WeGovNow platform.

This chapter also deals with recording each core component's current state so as to act as reference not only to the consortium members, but also to the IT departments of each pilot site so as to discover missing features, overlaps with their existing systems or possible technical conflicts.

Every core component is briefly presented and also the following 14 questions are being answered for each one, so as to act as reference point.

1. What development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java.
2. What development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
3. What data storage formats are used - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI shape files, KML, CSV, non-spatial databases, NoSQL databases
4. Are the tools available as open software - and if so provide links to the GitHub or other location where the software can be found
5. Is documentation available – and if so include a link to the location of this documentation
6. What is the level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools?
7. Do you use any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer?

8. What is the availability of any of the services offered by the tools as APIs to facilitate integration?
9. Are any methods of extending the tools available - e.g. by developing plug-ins?
10. Any support offered – online, phone etc. – and if so what are the response times. *(Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though)*
11. What are the main features of you tool/platform?
12. Any additional links to other information?
13. What is the license of your tool/platform - e.g. Apache, MIT, GPLv3 etc., including licensing of the dependencies such as libraries, 3rd party tools, etc.
14. Are you able/willing to re-license?

2.2.1 Firstlife

Firstlife is an urban data platform developed to connect crowd and institutional information about urban daily life. Firstlife has a GIS-based backend providing REST APIs for CRUD operations on place, events, news, posts and groups. Users can collaborate mapping the city through a web client, and share different point of views about the same urban entities. Users can explore the data through time and space and different scales by using a timeline and an interactive map. Furthermore, users can decide the map theme switching among category sets. Groups and users can easily view and share their maps through URL.

Firstlife conveys public information only. FirstLife does not provide any tool or support to private contents nor for personal relations. Users are engaged in working together in order to achieve results of public interest. The platform is open to any institutional or private initiative of public interest.

Firstlife through its web client and APIs provides the following features:

- 1) CRUD operations on “place”, “event”, “new”, “post”, “group”
- 2) Bounding box queries including a time interval and a since parameters
- 3) Adding images, comments and descriptions to existing entities
- 4) Joining/leaving groups
- 5) Subscribe entities and retrieve notifications
- 6) Retrieve personal contents
- 7) Notify improper contents
- 8) Moderate contributions

Further developments are addressing the geographical aggregation of content; the creation of simplified map-based views exploiting ontologies and geographical information.

1. Development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java
JavaScript, HTML5, CSS3, Leafletjs, Angularjs, ionic, nominatim API, MapBox tileserver API, CartoDB tileserver API
2. Development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
JavaScript, NodeJs, Express, Loopback, Strongloop
3. Data storage formats - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI shape files, KML, CSV, non-spatial databases, NoSQL databases
Postgres/PostGIS, MongoDB, Neo4j
4. Availability of the tools as open software - and if so a link to the GitHub or other location where the software can be found
None
5. Availability of documentation for the tools, including a link to the location of this documentation
API documentation at http://api.firstlife.di.unito.it/docs
6. Level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools
Kick off at march 2015, with a main project plus 8 branch projects, 800 users from around the city of Turin and 4.400 data points
7. Use of any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer
None
8. Availability of any of the services offered by the tools as APIs to facilitate integration
REST APIs
9. Methods (if any) of extending the tools - e.g. by developing plug-ins

Angular 1.5 components or any web app using firstlife APIs
10. Support offered – online, phone etc., response times. Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though
Ticketing system http://legal-informatics.di.unito.it/firstlife-helpdesk/
11. The main features
Firstlife provides: a map-based interface for collecting and visualize public information about the urban life from institutions organizations and users. The platform provides two types of users: citizen and organizations. Users can create places, events, news, posts and groups on maps. The entities can be interconnected creating a representation of real structures. Groups can be used to share group maps for specific purposes. Users can extract the map of their contents. The platform offers a multidimensional filtering system through map and timeline interaction and category selection.
12. Additional links to other information
http://firstlife.org User sandbox: http://sandbox.firstlife.di.unito.it/ Test: http://test.firstlife.di.unito.it/
13. Licensing - e.g. Apache, MIT, GPLv3 etc, including licensing of the dependencies such as libraries, 3rd party tools, etc
MIT, BSD
14. Are you able/willing to re-license
Yes

2.2.2 GeoKey and Community Maps

GeoKey provides a database-driven backend storage, together with a custom API that allows two main tasks namely interaction with data (data creation, editing, deleting) and the creation of projects which group data together. The latter is accessed via a web-based project management interface. In addition to this functionality, an API is also provided for user management, which is again enabled via a web-based frontend. The GeoKey architecture allows the data store to be accessed by any frontend application from the WeGovNow suite (web or mobile based) which can be customised making use of the provided APIs.

A flexible and stylish participatory mapping frontend, Community Maps can visualise data, compare information, and encourage conversation about the places which matter. Designed using the latest web development technologies, Community Maps offers a fast, reliable and intuitive interface. The display is clear, professional, and engaging for all screen types.

The Community Maps tools have been developed to make use of the GeoKey public REST API and separation between GeoKey and Community Maps allows to have one user interface for project management (more technical) and another for data collection/visualisation (intuitive and easy to use). This method hides complexity of the technology behind the minimalistic and modern approach for end-user interaction. All information within Community Maps is stored on GeoKey, where the API enables storage and retrieval of e data via secure SSL connection. This includes user information, which will be unified with WeGovNow user module (UWUM).

API interaction between GeoKey and Community Maps supports the following activities:

- User authentication and authorisation, editing of user information;
- Retrieving all or singular projects;
- Retrieving all or singular contributions (observation + location + comments + media files);
- Adding and editing contributions (including all relevant information).

Further development will add social media layer to the interaction model of the systems, including user authentication using Google, Facebook, Twitter or any other social account.

1. Development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java
Common: JavaScript, HTML5, CSS3, Twitter Bootstrap, MomentJS. Community Maps: Less for CSS3, AngularJS + plugins, lodash, Mapbox.js + Leaflet plugins, messageformat, moment. GeoKey: jQuery + plugins, Handlebars, Modernizr.
2. Development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
GeoKey: Python + libraries, Django + plugins. For the full list please refer to https://github.com/ExCiteS/geokey (bottom of the page).
3. Data storage formats - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI

shape files, KML, CSV, non-spatial databases, NoSQL databases
PostgreSQL/PostGIS with the HSTORE extension to allow flexible data structures and data storage as key/value pairs
4. Availability of the tools as open software - and if so a link to the GitHub or other location where the software can be found
GeoKey - https://github.com/ExCiteS/geokey
5. Availability of documentation for the tools, including a link to the location of this documentation
GeoKey - http://geokey.org.uk Community Maps - http://excites.github.io/communitymaps/#/api (code API) & http://help.communitymaps.org.uk/en/ (end-user help & tutorials)
6. Level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools
Established since 2007, with 125 projects, 700 users from around the world on both local and multinational projects and 12,000 data points.
7. Use of any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer
SSL certificate issued by COMODO RSA Domain Validation Secure Server CA.
8. Availability of any of the services offered by the tools as APIs to facilitate integration
GeoKey offers public REST API - http://geokey.org.uk/docs/web-api.html .
9. Methods (if any) of extending the tools - e.g. by developing plug-ins
GeoKey has been designed from the outset to be easily extensible, for example to allow the incorporation of a wide variety of sources of third party datasets and data streams. It can be extended developing extensions using a boilerplate template that is publically available via GitHub: https://github.com/ExCiteS/geokey-extension-boilerplate Currently there are extensions developed for: <ul style="list-style-type: none"> ● Importing data ● Exporting data ● Allow to attach web resources to projects and visualise them on Community Maps alongside native data points ● Integrating with Sapelli mobile app

- Integrating with EpiCollect mobile app
- Integrating with GeoTag-X
- Integrating with CartoDB

Extensions can be developed by anyone: <http://geokey.org.uk/help/how-to-create-an-extension.html>

10. Support offered – online, phone etc., response times. Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though

Both GeoKey and Community Maps support a live user base of over 700 users and 125 projects outside the scope of WeGovNow, and as such the team will promptly address any issues that arise.

GeoKey - GitHub issue management is used, and non-urgent issues are usually addressed within a week (sprint time).

Community Maps - the system is designed to enable users to report issues via a 'contact us' option which then alerts the specific project administrator to the issue. Assistance is also provided by a help page for the user, accessed via the website <http://help.communitymaps.org.uk/en/>

If using our own hosting, up to one-month backup/recovery time of the server is held as part of our contract with our hosting providers.

11. The main features

GeoKey - <http://geokey.org.uk/help/what-is-geokey.html>

Community Maps supports constructing digital representations of physical space through participatory action. Community Maps provides a map-based interface to create, edit and visualise geographic information. Its map-based interface provides means to add new data as well as editing and deleting existing data. The applications further provide a search to find contributions matching a given keyword and filtering according to the status of a contribution, also by the category.

12. Additional links to other information

Testing environments:

GeoKey - <http://play.geokey.org.uk>

Community Maps - <http://cm.geokey.org.uk>

13. Licensing - e.g. Apache, MIT, GPLv3 etc, including licensing of the dependencies such as libraries, 3rd party tools, etc

GeoKey - Apache 2.0

All frameworks/libraries/plugins used have either MIT, or BSD, or Apache 2.0 licenses, Pillow uses PIL license.

14. Are you able/willing to re-license

No - further investigation would be required due to multiple dependencies. D1.2 (M12) will include further details

2.2.3 Improve My City

ImproveMyCity is an open source, scalable platform that enables residents to directly report, to their public administration, local issues about their neighbourhood such as; discarded trash bins, faulty street lights, and broken tiles on sidewalks, illegal advertising boards, but also ideas and suggestions [4]. The reported issues are automatically transmitted to the appropriate department in public administration so as to schedule their settlement. Reporting is feasible both through a web- and a smartphone-based frontend that adopt a map-based visualisation, which makes reporting a user-friendly and intriguing process. The management and routing of incoming issues is performed through a backend administration infrastructure that serves as an integrated management system with easy to use interfaces.

Apart from reporting a new issue, frontend allows citizens to add comments or vote on existing issues, which adds a social dimension on the collected content. Also, the platform makes provision for informing the citizens about the progress status of the reported issue and in this way facilitate the establishment of a two-way dialogue between the citizen and public administration.

Some of the functionalities of **IMC frontend** are:

Map-based view of the issues: The reported issues are displayed on the city's map using a different icon for each issue category. The user can navigate him-/herself using the standard map-based functionalities and acquire more information about a certain issue by clicking on the corresponding icon.

List-based view of the issues: The reported issues can be also displayed in a list-based view. This view enables the interface to provide the user with the most important information about each issue such as: the title, the address, its progress status, the days passed from the submission date and the number of positive votes.

Issue-based view: Upon clicking an icon or a list entry the issue-based view appears. This view presents in a separate page detailed information about the selected issue such as: title, category, address, name of the citizen who submitted it, the date of

submission, photos, description, user comments, location on the map, and the number of votes.

Filtering: Users can filter the issues that appear in both the map- and list-based view. The displayed issues can be filtered by: a) the issue category, b) the progress status, c) vote-based ranking, d) owner and e) submission-date ranking.

New issue reporting: The user can submit a new issue by: a) providing a short title, b) selecting the issue category among a predefined set of categories and subcategories that have been determined by the municipality, c) determine the exact location of the problem by moving a marker on the city map (or provide a written address by hand), d) attach an image that describes the problem (this is optional), and f) provide the full description of the issue.

Commenting: Through the “Issue-based” view registered users can comment on issues submitted by other users, or answer to the comments made for their own issues by forming a discussion thread.

Voting: Through the “Issue-based” view registered users can provide a positive vote on issues they consider significant, allowing the municipality to prioritize the reported problems.

Feedback: The commenting functionality can be also used by employees of the municipality to provide written feedback about the reported issues.

Progress status (timeline): The citizens are informed about the progress status of their requests by email, as well as through a progress status bar that appears in the “List-based” and “Issue-based” views. Timeline provides transparency to citizens because it makes clear “who-what-when” an action is taken.

IMC backend

After their submission, the reported issues should automatically become visible to the clerks of the appropriate municipality department based on the issue category and/or location. The departments depend on the internal organisation of the municipality (e.g. technical service, municipal police, urban planning department, cleaning department, water supply & drainage department, etc.) and should be aligned with the categories presented to the user when submitting a new issue. The task of the designated employees is to initiate the established resolution process, reply to users’ comments and change the progress status of the issues accordingly. To facilitate the above, ImproveMyCity platform has implemented the following set of functionalities:

Integrated issue management system: The submitted issues are managed through an integrated environment that is based on Joomla or WordPress content management system. This environment provides the necessary interfaces and rights

management mechanisms, so as to make feasible the distribution of the management effort to the different departments of the municipality.

Web-based administration: The authorized employees manage the entries through a web form that presents all necessary pieces of information and applicable actions.

User comments management: The application provides a special page for displaying the submitted comments allowing the administrators and city officials to have an overview of the discussions about each issue.

Responsibility distribution: The backend interface makes the necessary provision so that different municipality employees to be responsible for different categories and/or departments. Moreover, the application allows the assignment of many accounts per category, so as to split the administration effort in more than one employees.

Easy customization: The backend interface is fully customizable in terms of user rights, comments, number of categories, notifications on new issues and comments, etc.

Reporting: The application is able to produce reports with statistically aggregated information, so as to help the city officials in assessing the overall performance of the municipality.

Analytics: A complete ecosystem that provides a dashboard of useful real-time analytics that smartly combines citizens' data to gain city insights.

1. Development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java
HTML5, CSS3, jQuery, JS, Google Maps API, Google Graphs API, Joomla!, WordPress
2. Development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
Apache recommended (or other web server), PHP (version 7 is also supported as of April 2016), Joomla!, WordPress
3. Data storage formats - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI shape files, KML, CSV, non-spatial databases, NoSQL databases
MySQL, export to CSV is also available with extra plugin installed
4. Availability of the tools as open software - and if so a link to the GitHub or other location where the software can be found

<p>The web-based version of IMC is completely free and open source. Github repository can be found at: Latest version: https://github.com/itsam/imc Older version https://github.com/icos-urenio/Improve-my-city</p>
<p>5. Availability of documentation for the tools, including a link to the location of this documentation</p>
<p>http://www.improve-my-city.com</p>
<p>6. Level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools</p>
<p>TRL9; IMC was installed officially for the first time in 2012 and this first installation is still up and running in Municipality of Thermi in Greece. ImproveMyCity:</p> <ul style="list-style-type: none"> ● Installed officially in 28 cities worldwide ● Translated in 19 languages including Dutch, Finnish, German, Greek, Italian, Portuguese (Brazil), Romanian, Spanish, Swedish, Turkish, Vietnamese and Arabic ● More than 1.000 downloads of the open source web-based application ● More than 14.000 registered users ● About 340 officials/clerks handling more than 750 categories ● More than 1.700 notification emails per day ● Over 8.000 submitted issues and suggestions
<p>7. Use of any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer</p>
<p>SSL is supported and in advance, API incorporates an encryption layer based on AES-256 algorithm. Special care is also given to avoid “Man in the Middle” attacks by using “use-only-once” security token per service call.</p>
<p>8. Availability of any of the services offered by the tools as APIs to facilitate integration</p>
<p>IMC functionality covered by REST-based API. API will be enriched/edited according to WeGovNow needs and requirements. Interactive programmers documentation is also available.</p>
<p>9. Methods (if any) of extending the tools - e.g. by developing plug-ins</p>
<ol style="list-style-type: none"> 1) Modules: Adds new features (e.g. Top Active Users) 2) Themes: Overriding the look ‘n feel (applied to IMC core and modules) both

<p>for Joomla! and WordPress versions</p> <ol style="list-style-type: none"> 3) Plugins: Extends the core usability (e.g. Notifications by SMS) 4) Packages (e.g. new reports, new languages, etc) 5) Libraries (any PHP library, e.g. tcpdf to export in PDF format)
<p>10. Support offered – online, phone etc., response times. Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though</p>
<p>Up to 24/7 according to support plan. For WeGovNow, Infalia offers the highest support plan available that includes issue ticketing and live Skype calls/chat GitHub issue management is used, and non-urgent issues are usually addressed within two days</p>
<p>11. The main features</p>
<p>Report (Citizens requests, complaints & suggestions)</p> <ul style="list-style-type: none"> • Reported via web or mobile: By allowing citizens to report issues from their home using the web version, or while on the street using the mobile app (iOS & Android). • Accurately positioned: By offering a map to facilitate citizens in determining the exact location of their issue. • Categorized based on their nature: By urging citizens to select one of the pre-specified categories reflecting the municipality departments. • Easily composed but descriptive: By asking citizens to provide only the information necessary to locate and resolve the issue, such as title, description, location and category. • Picture enabled: By allowing to attach photos on the spot for describing the issue. • Commented and voted: By offering the mechanisms to post comments or vote for issues that have been submitted by other citizens. <p>Administer (Citizens issues through an integrated management system)</p> <ul style="list-style-type: none"> • Browse effectively: Issues are presented on the city map, as an ordered list but also in a single-issue page displaying the full set of submitted details. • Track pending issues: Issues are automatically routed not only to the appropriate department but also to the inbox of the responsible officer. • Provide direct feedback: Provide written feedback to the citizens giving non-standard explanations for each specific case. • Distribute responsibilities: Assign one or more officers per category and split the administration effort across the municipality departments. • Monitor progress and update citizens: Resolve issues and inform citizens by email or through a progress indicator bar (Open -> Acknowledged -> Closed, etc.) • Customize easily: Fully customize the system in terms of user rights, number and nature of categories, notification rules and localization

settings.
<p>Analyse (Citizens data to gain city insights)</p> <ul style="list-style-type: none"> ● Filter and explore: Combine temporal filters with free keyword-based search and dynamically explore citizens' data through interactive visualizations. ● Discover hidden patterns: Observed spatio-temporal tendencies, unexpected periodicities, significant outliers, popular issues and prevailing terms. ● Aggregate and visualize: Aggregate data based on their spatial density or statistical frequency and visualize them using heat-maps, tag-clouds, colour codes and pie charts. ● Translate patterns into insights: Identify areas with dissatisfied citizens, under-performing departments due to heavy workload, seasonal burden on city infrastructures, etc.
12. Additional links to other information
The sandbox of ImproveMyCity for WeGovNow can be found at http://wegovnow.improve-my-city.com
13. Licensing - e.g. Apache, MIT, GPLv3 etc, including licensing of the dependencies such as libraries, 3rd party tools, etc
<p>IMC web-based: AGPL 3</p> <p>MySQL: For developers and distributors of open source software under a FOSS license other than the GPL, Oracle makes its GPL-licensed MySQL Client Libraries available under a FOSS Exception that enables use of the those MySQL Client Libraries under certain conditions without causing the entire derivative work to be subject to the GPL [http://www.mysql.com/about/legal/licensing/oem/]</p> <p>jQuery: MIT License</p> <p>Masonry: MIT License</p> <p>BlueImp jQuery upload library: MIT License</p> <p>Joomla! CMS: GPLv2</p> <p>WordPress CMS: GPLv2</p>
14. Are you able/willing to re-license
Yes, according to WeGovNow needs a dual licensing scheme will be applied to the web-based version of IMC

2.2.4 LiquidFeedback

In WeGovNow LiquidFeedback is the collective opinion formation and participatory decision making component and will be used to organise discussions among

stakeholders and allow citizens to express their opinions. This is done in a transparent process (credibility) using collective moderation (self-organising process; no need for a moderator), proxy voting/Liquid Democracy (mutual empowerment; dynamic division of labour, scalability), and preferential voting (no encouragement for tactical voting).

Data flow LiquidFeedback to map based user interface: LiquidFeedback will be invoked by API calls, e.g. deliver information on existing initiatives in the vicinity of a given location. The LiquidFeedback API will also allow any WeGovNow component to access every user function in LiquidFeedback and this way allow for a seamless integration.

LiquidFeedback will also provide the interoperability framework (UWUM).

1. Development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java
SQL (PostgreSQL), PL/pgSQL, Lua, WebMCP, Moonbridge Network Server for Lua Applications
2. Development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
see 1.
3. Data storage formats - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI shape files, KML, CSV, non-spatial databases, NoSQL databases
PostgreSQL
4. Availability of the tools as open software - and if so a link to the GitHub or other location where the software can be found
http://www.public-software-group.org/liquid_feedback
5. Availability of documentation for the tools, including a link to the location of this documentation
http://dev.liquidfeedback.org/trac/lf/ as well as INSTALL files and SQL comments being part of the distribution
6. Level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools

TRL 9; several thousand; worldwide
7. Use of any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer
TLS via reverse proxy (e.g. nginx) is recommended and supported
8. Availability of any of the services offered by the tools as APIs to facilitate integration
- / REST API by the end of project month 8
9. Methods (if any) of extending the tools - e.g. by developing plug-ins
-
10. Support offered – online, phone etc., response times. Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though
SLA possible
11. The main features
The main features are summarized on http://liquidfeedback.org/ and thoroughly explained in "The Principles of LiquidFeedback".
12. Additional links to other information
http://www.interaktive-demokratie.org/ http://principles.liquidfeedback.org/ http://www.liquid-democracy-journal.org/
13. Licensing - e.g. Apache, MIT, GPLv3 etc, including licensing of the dependencies such as libraries, 3rd party tools, etc
LiquidFeedback: MIT/X11, http://www.public-software-group.org/mercurial/liquid_feedback_core/file/ab05fb3bf974/LICENSE and http://www.public-software-group.org/mercurial/liquid_feedback_frontend/file/d08e4cadd33c/LICENSE SQL (PostgreSQL): BSD-style, http://www.postgresql.org/about/licence/ PL/pgSQL: same license as PostgreSQL

Lua: MIT/X11, https://www.lua.org/license.html WebMCP: MIT/X11, http://www.public-software-group.org/mercurial/webmcp/file/v2.0.3/LICENSE Moonbridge Network Server for Lua Applications: MIT/X11 http://www.public-software-group.org/mercurial/moonbridge/file/v1.0.1/LICENSE
14. Are you able/willing to re-license
Not necessary (all licenses permissive)

2.2.5 OnToMap

The complete OnToMap system is a Participatory GIS supporting information sharing and information retrieval of geographical data with a map-based user interface. The system is used to manage custom community maps reflecting personalised information needs.

In WeGovNow OnToMap is used in a subset of the offered functions, i.e., as a container of geographical information supporting the semantic exploration and the crowdsourcing of data. This is done thanks to the management of a semantic knowledge representation layer which supports the integration of heterogeneous data and the explicit representation of semantic relations between geographical data (not only taxonomic relations, but also semantic relations expressing topical relations among information items).

The semantic representation layer is based on an OWL ontology which describes the types of information managed by the system (concepts and relations representing the categories of information to be managed and the relations existing among them) and on a RDF representation of information items, which supports their exposition as Open Linked Data as well as the exploration of the information space browsing the relations among items through SPARQL queries.

The dataflow between the knowledge representation layer and the other system components will be based on software APIs which will support the following types of activities:

- Data integration;
- Storage of new information items (collected through crowdsourcing or retrieved from external Open Data sources);
- Search for information items based on the specification of geographical queries involving multiple concepts, and exploration of related concepts and items through the exploration of semantic relations between concepts;

- Possibly the exposition of Open Data as linked data, in order to make them available to external search engines.

1. Development languages, environments and APIs used for any frontend elements of the tools - e.g. Google Maps API, Open Layers, JavaScript, Java
<p>Note: OnToMap frontend will not be used in WeGovNow.</p> <p>Languages: HTML5, JavaScript</p> <p>Technologies (libraries): Leaflet (http://leafletjs.com/), Cytoscape.js (js.cytoscape.org), Bootstrap, JQuery</p> <p>External services: OpenStreetMap</p>
2. Development languages, environments and APIs used for any backend elements of the tools - e.g. PHP, Node.js, ASP.net, Java, Apache, Tomcat
<p>Languages: Java, SPARQL (for querying the ontology)</p> <p>Technologies (libraries):</p> <ul style="list-style-type: none"> • JENA (https://jena.apache.org/, for interacting with the ontology and managing linked data) • Guava (https://github.com/google/guava, helper for Java development) <p>Frameworks: Play (playframework.com, as web server and for developing OnToMap as an MVC application)</p>
3. Data storage formats - e.g. spatial databases (PostGIS, Oracle, MySQL), ESRI shape files, KML, CSV, non-spatial databases, NoSQL databases
<p>Representation formats for spatial data:</p> <ul style="list-style-type: none"> • RDF (w3.org/RDF/, for linked data representation) • GEOSPARQL (opengeospatial.org/standards/geosparql, for spatial data representation and queries) • SQL (for defining community maps) <p>Storage services:</p> <ul style="list-style-type: none"> • Parliament (http://parliament.semwebcentral.org/, for storing and managing linked data and spatial data as RDF triples) • PostgreSQL (postgresql.org, for storing application data)
4. Availability of the tools as open software - and if so a link to the GitHub or other location where the software can be found
Not at the moment
5. Availability of documentation for the tools, including a link to the location of this documentation
Documentation will be provided for the portion of OnToMap used within this

project.
6. Level of maturity of the tools - number of users, where the users are located, how long have the tools been used in a production environment, number of data points captured using the tools
OnToMap has been tested with groups of university students and Ph.D students
7. Use of any secure mechanisms - especially SSL - to enable secure login and/or secure data transfer
The backend of OnToMap includes a light authentication method but it can be integrated with an authentication service such as the one proposed in WeGovNow
8. Availability of any of the services offered by the tools as APIs to facilitate integration
Yes. The backend of OnToMap exposes APIs for querying the Open Data container
9. Methods (if any) of extending the tools - e.g. by developing plug-ins
No.
10. Support offered – online, phone etc., response times. Note that the overall WeGovNow platform will be a prototype and a production support service will not be provided though
ontomap@di.unito.it
11. The main features
Open data container Publish open data as linked data Query linked data by category of information (i.e., concept of the ontology) Explore linked data repository by following semantic relations between categories of information Add new geo-data, classified by category of information
12. Additional links to other information
http://ontomap.dyndns.org/ System demo (of the overall system, with User Interface): http://ontomap.dyndns.org/ontomap
13. Licensing - e.g. Apache, MIT, GPLv3 etc, including licensing of the dependencies such as libraries, 3rd party tools, etc

Libraries/components licenses: <u>Play Framework</u> : Apache License 2.0 <u>PostgreSQL</u> : PostgreSQL License <u>Parliament</u> : BSD License <u>Jena</u> : Apache License 2.0 <u>Guava</u> : Apache License 2.0
14. Are you able/willing to re-license
Yes, in conformance with the decisions taken by the rest of the consortium

2.2.6 Trusted Marketplace

The purpose of this component is to design robust reputation management mechanisms that will impose trust among the users of the match-making procedure as part of the overall Trusted Marketplace. The goal of this component is to suggest relative posts to registered users based on their interests and also to match requests with offers (e.g. volunteers) of support or co-operation based on trust among the participating parties. Thus, the reputation mechanism is also part of this component which although is not based on existing production solution, still considered as core component due to its main role. In WP3, there is a dedicated task (T3.4) that covers in detail the Trusted Marketplace and will answer the 14 questions. The deliverable D1.2 (M12) will include the filled table for consistency reasons.

2.3 Non-functional Requirements

In order to design a system that meets the highest standards in every aspect, the following basic properties have to be taken into account [1]:

- **Versatility**: offers flexible and efficient mechanisms to address a variety of problems with an economy of expression.
- **Conceptual integrity**: offers a single, optimal, non-redundant way for expressing the solution of a set of similar problems.
- **Independently changeable**: keeps its elements isolated so as to minimise the number of changes required to accommodate changes.
- **Automatic propagation**: maintains consistency and correctness, by propagating changes in data or behaviour across modules.
- **Buildability**: guides the software's consistent and correct construction.
- **Growth accommodation**: caters for likely growth.
- **Entropy resistance**: maintains order by accommodating, constraining, and isolating the effects of changes.

On top of those, especially for the WeGovNow, **compliance to accessibility standards** plays a major role and is taken into account from the very early phases of the project.

The above properties can be extended in the following questions that should guide us to consider all these factors towards a successful conceptual design:

Changeability: What changes may be needed in the software in the future, and what changes are unlikely and need not be especially easy to make in the future?

The possible changes in a research project with a long lifecycle are implied by the fact that trends in research topics are evolving. Moreover, no one can guarantee that external systems that we are referring to (e.g. social networks) will remain stable, in terms of API, content etc. Therefore, flexibility in changes has to be taken into account as a top priority. This will be achieved by adapting an “Agile methodology” development approach.

Performance: What will the performance of the product be?

Performance is a critical factor for the WeGovNow platform in three basic processes: (A) data acquisition from the different components, (B) analysis (e.g. OntoMap and Trusted Matchmaking) and (C) map-based representation. The particularity of WeGovNow is that it has to deal with non-homogenous content that eventually should appear under one common umbrella so that users have to deal with a single, unified user interface only. The WeGovNow platform prototype will have to demonstrate a pilot application (i.e. showcase the system capabilities in a limited environment) which will be scalable enough to be able to deal with the real-life number of end-users (citizens).

Capacity: How many will use the system simultaneously? How much data will the system need to store for its users?

The number of users for the prototype system is expected to be relatively small for testing and evaluation purposes. However, the target of the project is to serve a potentially huge number of users as well as to store a profound repository in size. For that reason, expandability in capacity has to be seriously taken into account. Moreover, the capacity for large volume persistence is an important issue for the project. This is handled by using a capable DB solution for the storage of data per component and in common when necessary (e.g. UWUM).

Ecosystem: What interactions will the system have with other systems in the ecosystem in which it will be deployed?

The ecosystem consists of both established apps/tools currently in use as well as various online data sources (e.g. social networks). Those systems might change over time. The solution to cope with this challenge is to keep a loose interface with

external systems, with generic calls encapsulating the underlying details of each external part of the ecosystem.

Modularity: How is the task of writing the software organised into work assignments (modules), particularly modules that can be developed independently and that suit each other's needs precisely and easily?

WeGovNow divides by nature the work among several partners in various organizational units (modules). Therefore, this affects the design, since the overall architecture has to be split in interoperable units that can be developed, deployed and tested separately, in an isolated environment. The adaptation of a Service Oriented Architecture with functionality exposed in loosely coupled web services gives this flexibility to the development team. Moreover, having in mind that the consortium really believes in open-data, allowing 3rd party modules to be easily embedded in the system, is a top priority.

Buildability: How can the software be built as a set of components that can be independently implemented and verified?

What components should be reused from other products and which should be acquired from external suppliers? A Continuous Integration approach will be followed with the setup of a Continuous Integration environment consisting of build tool, Continuous Integration server (e.g. Hudson), a tracking system and software quality analysis tools. Most tasks will be performed automatically during nightly builds. This will minimise effort for the users and will apply a smooth and efficient integration of the platform.

Building reliability: Is the platform buildable on the required schedule?

In order to monitor and control such a large project with a long lifecycle, an agile development methodology will be followed. This is based on frequent iterations being built on top of a rapid prototype. The prototype has to be made available from the very beginning of the project. Then all features will be added on top of this in subsequent iterations. Moreover, special attention has to be given on unit testing with the adaptation of a popular unit testing framework. Within the scope of the Continuous Integration approach, this will ensure building reliability and quality of the product.

Security: If the product requires authorisation for its use or must restrict access to data, how can security of data be ensured?

How can “denial of service” and other attacks be withstood? Due to the sensitivity of the personal information gathered (by user consent of course), such as user-profile and interests to support the Trusted Matchmaking mechanism, the system has to be very solid in terms of security. To this end, even from the very first versions of the system the access of information has to be restricted only to users with certain

privileges. When the system goes public, additional security mechanisms need to be applied (e.g. SSL). Denial of Service is not a possible threat for the moment and will be taken into account depending on the evolution of the project into a commercial application.

Accessibility: Is the system accessible to people with any kind of disabilities?

Ensuring accessibility for all, the WeGovNow consortium believes that accessibility compliance with the Web Content Accessibility Guidelines (WCAG) 2.0¹ on level AA is an absolute requirement. But the goal is to do more than what's required in WCAG. Towards accessibility, all different components and the integrated WeGovNow ecosystem will be checked for accessibility issues from the early stages of the project. Every sprint should necessarily include a task about accessibility conformance to the standards. Funka Nu AB (Funka), will provide all necessary details and best practices to pass the checks successfully (e.g. design for all)

¹ W3C has developed the Web Content Accessibility Guidelines 2.0 to help authors and developers ensure that all users should have the possibility to access the information and services. <https://www.w3.org/TR/WCAG20/>.

3 Methodological framework

3.1 The WeGovNow case: Agile and Scrum

Scrum methodology is a great way for teams to get started with agile development and WeGovNow will adapt a Scrum variant which is perfectly suited for the project workflow. This will enable the RTD to be driven by the needs and preferences of the beneficiaries and user groups rather than following a “waterfall model” sequential process as it is often used for technical development projects.

Problems and obstacles can be identified very early in the development process and thus can be taken care of shortly after emerging. In specific, applying a Scrum variant in WeGovNow will result in developing a product that can easily respond to the regular feedback received from the project stakeholders while maintaining a predictable schedule for delivery.

The most effective Scrum teams are tight-knit, co-located, and usually 5 to 7 members. WeGovNow teams are by nature cross-functional and self-organizing as team members have differing skill sets, and can cross-train each other so that no one person becomes a bottleneck in the delivery of work. Applying this Scrum variant results in a continuous communication between WeGovNow partners which greatly mitigates the risk of lack of communication between the various teams involved in the RTD.

The mission of the WeGovNow consortium is to create a platform integrating several software components which are already under active development by the corresponding partners. The partners agreed the aim of the development is to integrate the independent software components based on open interfaces in order to ensure a maximum of reusability by recombination with other components. This will also help ensure sustainability. Specifically, the grant agreements states in Part B:

“Whenever possible, the project will use generic open interfaces of the individual components, rather than creating a project specific meta-level. This will not only contribute to avoiding overhead but also ensuring sustainability of the development, as these interfaces are not restricted to the WeGovNow system but can also be used for the individual components. Other than that this will also allow the combination with non-project components without the barrier of a project specific ‘standard’.”

Therefore, the task is not to manage the work of individual developers but to effectively organise the cooperation between developer teams and all other consortium partners. This comes with the advantage that existing developer teams can continue to apply their established and successful work methodologies.

Consequently, WeGovNow can focus on an agile process to organise the cooperation between the teams. We believe a methodological approach based on an adjusted Scrum process can accomplish this task in an efficient manner and at the same time minimise overhead of unnecessary communication between the different teams by observing protocols to be agreed upon by consortium partners.

The three main roles of Scrum shall be adopted to the WeGovNow case as follows:

- Product owner of WeGovNow: PCC
- Developer: each technology partner handled as one developer
- Scrum master: WP leader

To stress the importance of the communities involved we suggest to add:

- Stakeholder: the community partners

in addition to the traditional scrum roles.

3.1.1 Sprints

WeGovNow development will essentially be cyclical and proceed in sprints with rather short feedback loops. Each sprint produces a prototype every month. Three prototypes will be particularly stable releases, which will be published and represented by milestones. It should be noted though that each partner **internally** will define sprints according to their needs and their own pace. The first **common** WeGovNow sprint is expected after M8 and will deal with UWUM. More details will be provided in WP3 (Agile development of the WeGovNow platform) deliverables.

In WeGovNow, user stories are collected in collaboration with stakeholders in a dedicated sprint task. The first week of a sprint is a warm up phase. Every group will internally assess and describe their items of work in the backlog. Items of work can be software development, but also elaboration of a use case, negotiation of access to a data source, and their activities. At the end of the week, there will be a phone conference where the planning group decides which items of work shall be moved to the sprint backlog and carried out in the hot phase during the next two weeks.

After each week there will be another phone conference for coordination. The fourth week is the cool-down phase. It starts with a teleconference demonstration of the new development and discussion of the work items achieved. Comments can be supplied and new items of work can be added to the backlog during this week, which will be assessed at the beginning of each sprint.

The features added to the backlog of things to do are commonly written as user stories. From a use case, multiple user stories can be obtained. The structure of a story is: "As a **<user type>** I want to **<do some action>** so that **<desired result>**". This is done so that the development team can identify the user, action and required

result in a request and is a simple way of writing requests that anyone can understand. A story is an *independent, negotiable, valuable, estimable, small, testable* requirement ("INVEST"). Despite being independent i.e. they have no direct dependencies with other requirements, stories may be clustered into epics when represented on a product roadmap or further down in the backlog.

As a cross cutting task, a dedicated works strand will focus on ensuring that the user needs are adequately met right from the beginning when it comes to designing WeGovNow platform functionalities and user interfaces. Accessibility and usability evaluations under the Design for All approach will be carried out as an integral part of the agile development process. In contrast to traditional approaches to accessibility and usability evaluation, iterative evaluations within an agile context need to be rapid and efficient, but must still be thorough enough to reveal any problems that newly added features have introduced.

Embedding these evaluations in an agile software development process provides timely feedback from users and as such provides the basis for intensive collaboration between users, accessibility and usability experts and software developers. System developers and usability/accessibility experts (led by Funka Nu), during the first week of each sprint participate in a conference call to decide what parts of the application they will be testing – in the form of click dummies or live code. This allows the design team to familiarise themselves with the application or feature and to identify the goals of the current iteration of the user evaluation, develop a protocol for user interviews, and recruit participants across validation sites for the study.

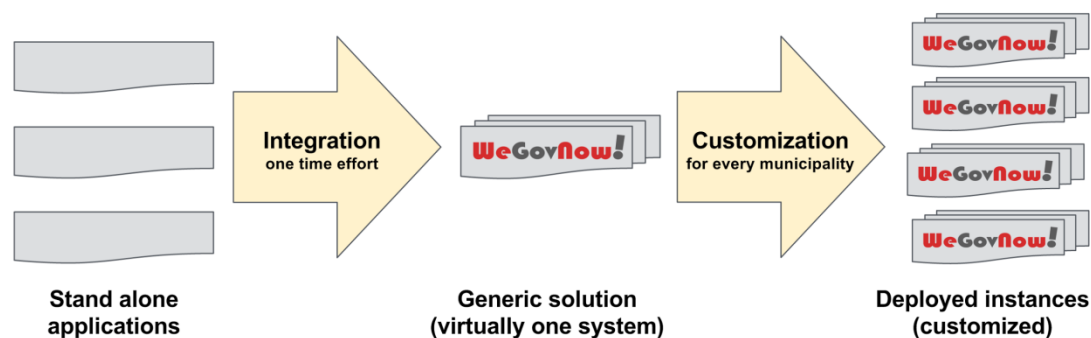
During the third week of each sprint, the usability/accessibility team conducts testing with the participants they recruit. To facilitate and speed up the delivery of feedback to the team, a facilitator leads each test session, and a note taker captures users' comments during each session. Typically, five to eight users will participate in each cycle of usability/accessibility testing.

At the end of each four-week sprint, the evaluation team synthesises their observations and the participants' feedback and reports results to the development team, including recommendations for improving the application or feature. Then the two teams (usability/accessibility experts and software developers) participate in another conference call to discuss the findings, provide clear answers to any questions, and address any concerns

3.2 Interoperability framework

The WeGovNow approach and digital tools aim at complementing existing e-Government services and systems rather than substituting them. Nevertheless, a

meaningful interlinking will enable smooth integration into local infrastructures and processes, with a view to ultimately improving transparency, accountability, effectiveness and efficiency of public services and promoting democracy. To this end, a range of technical and non-technical issues need to be addressed, the primary goal being to achieve successful data exchange, meaning exchange and process agreement. WeGovNow will apply a multi-layered interoperability framework including Technical Interoperability (data exchange), Semantic Interoperability (meaning exchange) and Organisational Interoperability (process agreement). During the requirement elicitation and development phase of the overall project a particular effort will be made to identify and analyse interoperability requirements, thereby taking into account influencing factors such as legal, political (policy) and socio-cultural issues.



The development process will consist of two major stages: **integration** to create a flexible generic solution and **customization** according to customer requirements. The first task has only to be done once and decides on how much effort will be needed for the customization at each municipality (WeGovNow and beyond) but also on how easy further adoption is.

During integration we will create an integrated solution for We-Government and provide a unified WeGovNow user interface while we keep the applications maintained separately. We will avoid overhead / meta, develop open source software and follow open specifications. The result will allow recombination with 3rd party applications in future use cases / developments.

The integration will address:

- Linking user accounts (SSO)
- Platform navigation
- Look and feel
- Application discovery

- Feature integration

The Unified WeGovNow User Management (UWUM) component will provide 6 central API interfaces (GET authorization, POST token, POST validate, GET client, GET navigation, GET style). Everything else can be done bilaterally. The authorization protocol against the UWUM will use the OAuth 2.0 framework.

3.2.1 Quality of Data

When making use of data with a geospatial aspect, it is important that users are aware of the underlying quality of the data so that they can make an informed decision that the information is “fit for use”. With regards to this data quality, standards are available (such as the ISO 19157 standard on geospatial data quality) that define a number of metrics that can be used to assess this. These metrics include aspects such as geographic accuracy, logical consistency, temporal consistency and data omission/commission. Within the WeGovNow project, research will be conducted as a means of identifying what metrics are important for different types of users (i.e. a layman user looking up local initiatives, or a council employee assessing the density of requests for assistance in a local community), determining how these metrics can be derived from the data, and what methods are appropriate for portraying these quality metrics to the end user.

At this stage, it is envisioned that information regarding these aspects will be served to the varying components of the WeGovNow platform via a newly developed service. This service would accept information from the calling component (such as the type of user and the metadata regarding the data being portrayed) and consume this to provide recommendations about the derivation and presentation of quality information. This service would be accessed through an API following relevant data standards used within the platform. The derivation of the information to be passed back to the calling component would be subject to scientific research conducted involving evaluation of the state-of-the-art in the field of quality metric identification and portrayal, and engagement with end users within the pilot sites.

3.2.2 Technical interoperability

Technical-level (specifying data formats, data exchange and security protocols, etc.) interoperability of data structures will be applied. Widely-used open standards and technologies that will be adopted is listed (but not limited to) below:

- **Web Services**

- **OSM** (OpenStreetMap) will be utilized by all components in terms of technical interoperability.
- **JSON** as a minimal, readable format for structuring data.
- **REST** (Representational State Transfer) as an architecture style.
- **Open311**: Towards data transparency and integration and collaboration, this standard will be fully incorporated.
- **OAuth 2.0**: As the Authorization Framework
- **GeoJSON**: Towards geographical reference of POI, markers, etc.
- **Schema.org**: For web metadata, common schema, accessibility and indexing

3.2.3 Semantic interoperability

When it comes to Semantic Interoperability, several characteristics of the data to be exchanged will be agreed, thereby relying on existing anthologies wherever possible, including context-specific data attributes such as units (e.g., metric versus imperial units), validity (e.g., retirement-related information is valid only if the age of the person is greater than 65) and time period (e.g., a policy may not apply if an event occurred during a certain period of time). Beyond this, relevant stakeholders will agree what to do with the information exchanges where required to achieve Process Interoperability.

The OnToMap semantic layer will be exploited for semantic interoperability among the WeGovNow components. The OnToMap ontology will be used as an “interlingua” among the various services integrated in WeGovNow. Specifically:

- The concepts defined in the OnToMap ontology will be used as an official description of the content to be handled in the maps (POIs, local services, etc.), and for structured presentation purposes as they will specify the attributes of data to be presented in the maps.
- The introduction of new information items (crowdsourcing) from the frontend applications (Firstlife, etc.) will be guided by the OnToMap ontology which will provide the expected structure of the data to be inputted (attributes, possible values in terms of domains, etc.).

It should be noticed that the ontology will be developed in accordance with the requirements of the Municipalities (in order to represent the types of information needed by them). Moreover, it will be defined by taking into account well-known standards for knowledge representation: in particular, Schema.org² will be taken as a reference for the specification of high-level concepts (e.g., for defining services,

² <http://schema.org>

places, events, etc.). For the specification of geographic information, geometries, etc., we will take into account standards such as GeoJSON and WKT.

Even though the management of semantic information provided by OnToMap will imply acquiring the geo-data managed by the integrated services and translating them in a semantic format (as linked data), the applications will be able to locally manage such data and OnToMap will play the role of an intermediary between the map-based user interface of WeGovNow and the data sources. Possible heterogeneity issues emerging in the data representation adopted by different applications will be analysed and at least partially addressed by mapping data through the ontology. In addition, though, some core components (e.g. Community Maps) due to their multi-project incorporation capabilities, does not need to have a fixed schema at all - each project identifies its own data and defines its own schema, so the system will need to be able to cope with this. In this case, the schema is not defined by people with any ontology expertise, but rather by the community groups themselves.

3.2.4 Organisational interoperability

As with any innovation, structural change is not always easy to achieve. For public administrations, the well-known phenomenon of organisational inertia may hamper the full and/or rapid exploitation of benefits provided by the WeGovNow approach and digital tools. Within the project this issue has been mitigated, as the participating organisations in general – and the validation sites in particular – display strong commitment to achieving structural change, perceiving WeGovNow as a catalyst of change. When it comes to the wider exploitation of successful outcomes beyond the immediate project duration, organisational inertia may well be an issue. However, there is evidence that governments are starting to take tangible steps towards developing more participatory and collaborative governance modes (e.g. in the framework of the British government's "Big Society" vision of services outsourced entirely to the community), albeit ICT infrastructure facilitating such efforts in a more comprehensive manner is still lacking. Pressure on the ground seems sufficient to drive public administrations into overcoming structural inertia, whereby points of departure may vary considerably across/within countries – both technology and strategy wise. To maximise impact, attention will thus need to be given to ensuring that WeGovNow outputs effectively facilitate innovation, yet also enable local governments/administrations to start from where they currently stand. Consideration will be paid to intersections between WeGovNow solutions and existing e-government infrastructures.

4 User Issues

In WeGovNow we will combine the ‘Design for All’ and ‘User-Centred Design’ approaches to ensure that individual technological components and the proposed integrated solutions are truly inclusive, effective, accessible and easy to use by different user groups with different perspectives and needs.

4.1 Design for All

Based on widely accepted ‘Design for All’ principles and guidelines we will work towards addressing and *overcoming common interaction barriers that influence usability and accessibility*. We will also consider the applicability and relevance of the existing ‘Design for All’ guidelines and principles (as discussed in the next sections) in the context of WeGovNow, especially with respect to the spatial component. We expect that not all guidelines will be relevant as we are already aware that user interaction differs from the interaction with other types of online information. We will thus further employ guidelines and principles from the spatial context. By the end of the project we will identify, process and evaluate several usability and accessibility guidelines to establish a set of WeGovNow ‘Design for All’ principles that will be relevant to our context but also to widely used geospatial interfaces.

4.1.1 Accessibility requirements

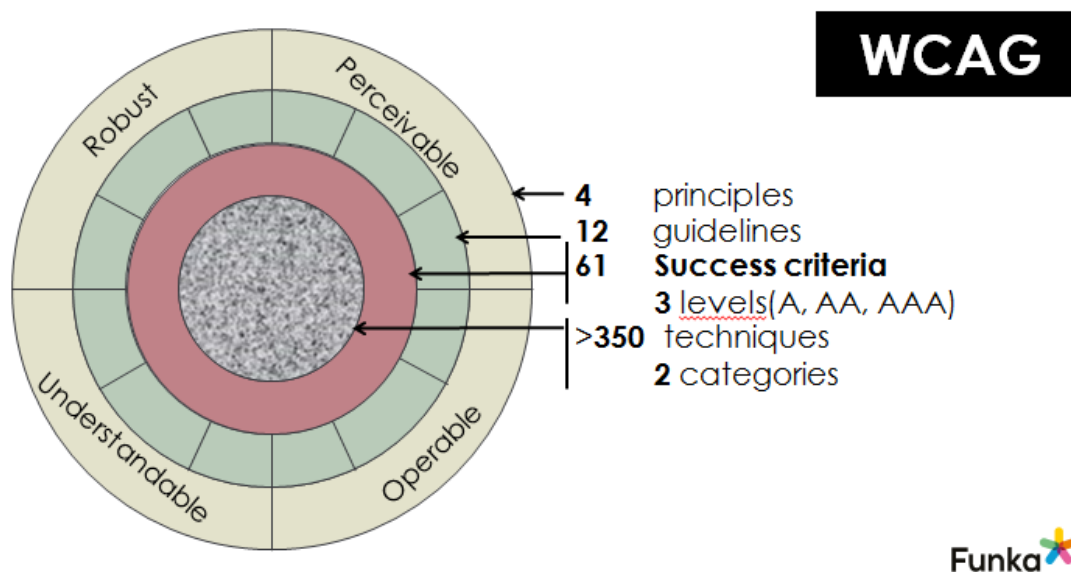
Web Content Accessibility Guidelines 2.0

WCAG 2.0³ is the most essential standard for web accessibility. It is divided into three levels, A, AA, AAA (with triple A being the most demanding level). WCAG has become a bridge between legislation/policy and the practical work with understanding what constitutes an accessible interface. It is now an ISO standard (ISO/IEC 40500:2012) and by that a globally recognized standard for web accessibility. It is the World Wide Web Consortium (W3C)⁴ that is responsible for WCAG 2.0 (and other relevant but not as prominent web accessibility standards).

³ <https://www.w3.org/TR/WCAG20/>

⁴ <https://www.w3.org>

Exhibit 6: An overview of WCAG 2.0



At its core, WCAG 2.0 consists of four general principles and twelve guidelines. These are then translated into 61 measurable success criteria in three levels, A, AA and AAA, with triple A being the most demanding. The success criteria are technology-independent, meaning that they can be applied to any number of different technologies. As a consequence, WCAG is not specific enough to be directly used as requirements for designers and developers. Its guidelines are open for interpretation and specific success criteria can be solved and handled in different ways.

WCAG is often regarded as difficult to understand for designers and developers not familiar with accessibility. An essential part of the work in this project is therefore to transform the general requirements presented in WCAG into specific and easily understood and easily controllable requirements. Also note that not all of the material presented in WCAG 2.0 is applicable for the WeGovNow platform.

WCAG 2.0, level AA is designed to be the standardized minimum baseline for accessibility. Legislation and standards for public procurement in many parts of the world will address this level of accessibility as the absolute minimum. A failure to comply with the AA level may render the product or service illegal or otherwise not possible to procure.

Level AA is mainly targeting the technical construction of a web interface. To accomplish this level of accessibility, it will be essential for the system to correctly apply standards for HTML and CSS, to correctly use scripts and to be familiar with the specific concepts of WAI-ARIA and the general concepts of Rich Internet Applications.

Level AA also aims to ensure that users are able to connect to the service using their own assistive technologies, such as screen-readers, screen enlarging software, text to speech software and other assistive software and devices.

WCAG 2.0 has been heavily criticized for overlooking cognitive accessibility requirements. To address this problem, the W3C has established a Cognitive and Learning Accessibility Task Force⁵, aiming to identify future needs for updates in WCAG. WCAG 2.0 has also been criticized for having too much of a technical focus^{6,7}.

Authoring Tools Accessibility Guidelines

The Authoring Tool Accessibility Guidelines (ATAG)⁸ focus on the publishing environment. In WeGovNow users will both be end-users but also authors, posting information. In this context it is important to consider relevant guidelines in ATAG as well as WCAG.

Other relevant guidelines

Over the last decade, there has been a growing number of research studies, which explore how people (especially non-expert users) interact with online mapping interfaces in various contexts (i.e. from simple online mapping such as Google Maps, which support way finding, to more advanced applications that support different levels of public engagement in governmental decision-making). There is already evidence that specific interaction aspects (which focus both on the user and on the interface/map design) may pose difficulties and barriers to non-expert users. Together with accessibility principles we will also evaluate the WeGovNow spatial interfaces against popular guidelines, such as Nivala's (2008) [3] usability guidelines for online mapping and Skarlatidou et al., (2013) [2] trust guidelines for public engagement.

Accessibility guidelines for this project

A list of requirements both in regard of concept and design, and techniques can be found in Annex A.

⁵ "Cognitive and Learning Disabilities Accessibility Task Force." [Online]. Available: <http://www.w3.org/WAI/PF/cognitive-a11y-tf/>. [Accessed: 03-Feb-2016].

⁶ S. Lewthwaite, "Web accessibility standards and disability: developing critical perspectives on accessibility," *Disabil. Rehabil.*, vol. 36, no. 16, pp. 1375–1383, 2014.

⁷ L. Seeman, "Formal Objection to WCAG 2.0," W3C Mailing list, 2006. [Online]. Available: <http://lists.w3.org/Archives/Public/public-comments-wcag20/2006Jun/0118.html>. [Accessed: 24-Jan-2016].

⁸ <https://www.w3.org/WAI/intro/atag.php>

4.1.2 Accessibility Validation tools

There are a huge set of different validation tools available when testing for accessibility. They are not used to check for compliance but are used to identify potential problems. Here are a few examples that will be used in this project:

- The W3C Markup Validation Service⁹ will be used to verify if the HTML code follow an HTML standard correctly.
- Web Accessibility Toolbar¹⁰ will be used to inspect how different objects are implemented on single web pages, e.g. if something that looks like a heading is created with HTML elements h1 to h6.
- Colour Contrast Analyser¹¹ will be used to verify if text colours have enough contrast to the background.
- The "Developer Tools" in Internet Explorer¹² will be used to inspect and find specific code occurrences, e.g. if a form object is correctly associated with its label text.

4.1.3 Accessibility testing

Expert evaluations and reviews

Funka has long experience of accessibility work in different fields. Their experts have accumulated a lot of knowledge about what solution works for different types of users, and also how different types of problems need to be solved to make the system accessible and useable. By letting Funka's experts evaluate the system, we can identify many potential problems before involving end users. This will make the later user involvement much better targeted to find key areas to improve. All expert evaluations will be documented in reports. Typically, a presentation from Funka contains:

- A reference to the accessibility problem/the relevant checkpoint;
- A background description of the problem/the targeted area;
- A description of the actual problem identified;
- A description or a recommendation of what to do/how to solve the problems;
- (Sometimes) code examples that can be directly implemented by developers.

A broad range of experts will participate depending on the nature of the accessibility problem that is being addressed.

⁹ <https://validator.w3.org>

¹⁰ <https://www.paciellogroup.com/resources/wat>

¹¹ <https://www.paciellogroup.com/resources/contrastanalyser>

¹² [https://msdn.microsoft.com/library/hh968260\(v=vs.85\).aspx](https://msdn.microsoft.com/library/hh968260(v=vs.85).aspx)

User testing and involvement

Expert evaluations is a great means of getting feedback based on current knowledge, but when building something new that hasn't been tested with users in previous projects, it is necessary to include users in the process. When testing with users, depending on what is to be tested in a given situation, Funka tries to include users with some kind of impairment that affects their ability to use the system. This could be related to problems with:

- Cognition;
- Hearing;
- Vision;
- Reading and writing;
- Motor, physical problems with the body;
- Social interaction.

Funka uses a number of testing tools. At this point we cannot exactly specify when and how those will be used. But the "toolbox" includes for instance:

- Tools for automated tests of technical issues;
- Eye-tracking (Tobii);
- Concept testing tools (Loop 11, Optimal workshop);
- Prototyping tools (Axure, Zeplin);
- Survey tool (Surveygizmo).

Funka can do tests on a number of assistive devices and technologies, including but not limited to:

- Screen-readers;
- Enlarging software;
- Text to speech software;
- In-built features in operating systems;
- In-built features in browsers;
- Devices replacing the use of ordinary mouse and keyboard.

4.2 User-Centred Design

User-Centred Design (UCD) is at the heart of WeGovNow ethos and practices and it will be used in the customisation stage of the project. First, we will use UCD to capture user requirements, needs and expectations and create our personas and use case scenarios accordingly. Second, UCD will be used to evaluate individual and integrated components with real users to ensure that needs are fully met and that the interfaces are effective and efficient to use by different user groups. Third, special emphasis will be given towards identifying user trust concerns and

implementing a trust-oriented design to ensure that the proposed system is not only easy to use and efficient but that it is verifiable by its intended audience and that it can be used to establish a trusting relationship amongst the users and the local authorities.

4.2.1 User requirements: Personas and use case scenarios

A set of use case scenarios will be identified and consolidated in collaboration with citizens and local stakeholders at the three trial sites. We will engage in discussions with local stakeholders from the early stages to identify local problems and needs and work with them towards understanding how WeGovNow can fully support them to address them. For example, while the city of Turin may focus on the use of green spaces and the regeneration of common goods, San Dona di Piave may use our tools to address local concerns about ageing and in social care.

Each use case scenario will consist of a descriptive part ('Which party is going to act in what way and for what purposes?') and an analytical part ('Which requirements need to be met when implementing the scenario in technological, organisational, legal and other regards?'). Once the use case scenarios are identified in each of the three trial sites we will continue working with local stakeholders and citizens to identify key user needs and expectations and build the key personas for each use case. We expect to have at least 2-3 personas per use case.

In D2.1 (WP2) a preliminary description of the major issues in each of the three trial sites is provided and in addition the following questions are answered:

1. What are the actions, initiatives, use-cases, projects you are currently working on that could benefit from WeGovNow?
2. What is that your Municipality wants to achieve by using WeGovNow from i) their citizens' point of view (end-users) and ii) from the official's / clerk's point of view (backend-administration)?
3. What is your current approach to community engagement (so that we could identify potential aspects that should be included in WeGovNow according to your needs and requirements)?
4. What are the technologies you already using and you want to be integrated with WeGovNow and possible conflicts?

4.2.2 Evaluation: maximising usability, usefulness and trust

One of the many advantages of working closely with the local stakeholders and citizens to understand local concerns and shape corresponding user requirements

and needs is to demonstrate how WeGovNow is used to solve real problems in real settings maximising the perceived usefulness of interacting with WeGovNow tools.

To further understand user requirements with respect to the provided functionality and the interface design we will run iterative usability and co-operative evaluation sessions with real users at all trial sites. As it is the case with most UCD practices, the number of sessions as well as the number of participants that will be engaged in each session, depends greatly on contextual factors and implications of each use case, which makes it impossible to provide a specific methodological plan for user testing at this stage. However, it is expected to run tests with real users at three stages. In the early stages our aim will be to understand the design and functionality strengths and weaknesses for each tool separately (especially those that influence the perceived usability and trustworthiness) within the context of each use case.

Based on discount usability engineering principles we expect to engage at least 10 users for each user type in each trial site. The findings from the initial evaluations will be used to assist development and improve functionality and interface design. Then a second round of user testing sessions will take place to test development and interface design improvements. Finally, user-testing will take place to evaluate the final performance of provided tools and integrated interfaces (when necessary) to ensure that end users can efficiently and effectively use our tools and that they trust them.

Evaluation work will be supported by the ASSIST (assisted e-service deployment) methodology which originally developed by WeGovNow lead partner empirica on behalf of the European Space Agency back in 2011. Since then it has been applied and iteratively refined in other national and EU programmes. The ASSIST approach is founded on cost-benefit analysis (CBA), following extensive recommendations that CBA is the most appropriate tool for analysing the impact of investments and activities in domains of public interest.

The evaluation framework and ASSIST will be detailed in D4.1 (M12).

5 Legal, data protection and ethical standards

5.1 Legal requirements for processing of personal data

This chapter presents a short list of interim conclusions that will guide the WeGovNow Consortium in future actions.

- WeGovNow will partly obtain personal data of individuals for analysis (e.g. Trusted Marketplace). This could be either the real identity of individuals or metadata which could indirectly lead to the identification of individuals. This is the case in all three scenarios (pilot sites), in which the end users (citizens) want to know the identity of the sources/contributors and possibly create their profiles;
- Some of this personal data will be obtained from social media networks. The fact that personal data was made public on social media networks (or anywhere else) does not mean that the data protection legislation stops applying. Particularly, the principles of personal data processing (always under user consent), the obligations of data controllers as well as the rights of data subjects stay intact and need to be given full attention; The same applies for personal data given explicitly in the WeGovNow during registration through UWUM, local registration or profile editing in general.
- One of the main points to determine at this stage of the project is the legal ground for processing personal data in WeGovNow. Due to the nature of the project, it seems at this stage that three options we can rely on are: a) user consent, and b) legitimate interest of the pilot sites (The set of legitimate interests will be defined, published and it will be clarified how they relate to the WeGovNow project), and c) verifiability of the results. Currently, it seems that we will use a combination of these grounds, depending on the case. This however posts several research questions that will have to be addressed in the project. Mainly, in the planned environment: 1) how do we request consent that will be valid which will not be possible without unambiguous positive identification (danger of confusion or identity theft), 2) how do we comply with the obligation to inform data subjects about the processing of their personal data when this data is not collected directly from them.

It should be clarified that the above list refers solely to WeGovNow as a research project. In the exploitation phase, these formal settings will have to be re-evaluated, taking into account an entity that would be deploying the platform, its location, purpose, etc. In those instances, it will arguably be the best to only collect information necessary to accomplish a legitimate purpose whereas each purpose needs to be publicly documented, and to require an informed consent by the users affected. Following these simple rules, any legal issues with privacy laws should be resolvable during exploitation. Apart from the rules on privacy and data protection,

the results of WeGovNow will also depend on other legal aspects. Specifically, we will need to take into account rules on intermediary liability, media law and copyright law. Moreover, in the design process we will need to consult the Terms & Conditions for social networks' APIs. These rules, set up entirely by social media providers, create additional limitations that cannot be ignored in WeGovNow. These aspects will be further analysed during the project.

5.2 Legal and Ethical Standards

All work within WeGovNow will be carried out according to relevant legal and ethical standards. The project aims at tapping into emerging technologies for effectively supporting co-production by civic society stakeholders and collective proposition development, whereby citizens are seen as partners as opposed to customers in the delivery of public services. This is to be achieved by integrating a set of innovative technologies within a unified citizen engagement platform. Against this background, legal and ethical requirements concern different fields of activity within the overall project, in particular when it comes to:

- involving human beings in the technology development process;
- processing personal data of WeGovNow platform users;
- piloting the WeGovNow platform under day-to-day conditions in a real world setting.

Ethics related requirements on the project are specifically addressed in a dictated document, the Ethics & Gender Management Plan (D6.2), generated under WP6. In the following, legislation with relevance to WeGovNow is identified and initially discussed. During the remainder of the first project year, the identified legislation will be further analysed and brought to bear on the specific project activities concerned. The current document will be updated respectively, as set out in the work plan (D1.2).

5.3 European-level Regulation

At the European Level different regulatory fields have been identified so far which are potentially relevant to WeGovNow. These are briefly discussed in the following subsections.

5.3.1 Fundamental human rights

The European Union Charter of Fundamental Rights was adopted in 2000. For the first time in the European Union's history, it has set out in a single text the whole range of civil, political, economic and social rights of European citizens and all people's resident in the EU. The Charter provides a general value framework for the European Union as a whole and its individual Member States. With respect to the

thematic focus of WeGovNow, some basic principles of particular relevance to ICT-enabled citizen participation can be derived from the Charter text as follows:

- respect for the integrity of a person,
- respect for privacy and family life,
- protection of personal data,
- non-discrimination,
- integration of persons with disabilities.

5.3.2 Data Protection and Privacy

Directive 95/46/EC (DPD)

WeGovNow is likely to obtain personal data of individual users for different purposes. Depending on the outcomes of further use case consolidation to be pursued at each of the three pilot sites during the next project phase, this may concern the real identity of individuals or metadata which could indirectly lead to the identification of individuals. Some of this data is likely to be derived from social media networks external to the WeGovNow platform. Also, personal data may be directly entered by the user into the WeGovNow platform, e.g. for local registration or profile editing purposes through UWUM in general. In both cases, WeGovNow has to comply with data protection and privacy legislation.

At the European level, the so called Data Protection Directive complements fundamental rights in the area of personal data protection. Personal data are defined as "any information relating to an identified or identifiable natural person ("data subject"); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity;" (art. 2 a).

By adopting the Data Protection Directive of 1995 (Directive 95/46/EC) the European Union set legally binding rules for the protection of individuals with regard to the processing of personal data. Through this regulation basic principles for processing personal data have been stipulated which have to be followed in all Member States:

- Transparency: The data subject has the right to be informed when his or her personal data are being processed. The controller must provide his or her name and address, the purpose of processing, the recipients of the data and all other information required to ensure the processing is fair. (art. 10 and 11). Data may be processed only under the following circumstances (art. 7):
 - when the data subject has given his or her consent
 - when the processing is necessary for the performance of or the entering into a contract
 - when processing is necessary for compliance with a legal obligation

- when processing is necessary in order to protect the vital interests of the data subject
- when processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller or in a third party to whom the data are disclosed
- when processing is necessary for the purposes of the legitimate interests pursued by the controller or by the third party or parties to whom the data are disclosed, except where such interests are overridden by the interests for fundamental rights and freedoms of the data subject

The data subject has the right to access all data processed about him or her. The data subject even has the right to demand the rectification, deletion or blocking of data that is incomplete, inaccurate or isn't being processed in compliance with the data protection rules. (art. 12)

- Legitimate purpose: Personal data can only be processed for specified explicit and legitimate purposes and may not be processed further in a way incompatible with those purposes. (art. 6 b)
- Proportionality: Personal data may be processed only insofar as it is adequate, relevant and not excessive in relation to the purposes for which they are collected and/or further processed. The data must be accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that data which are inaccurate or incomplete, having regard to the purposes for which they were collected or for which they are further processed, are erased or rectified; The data should not be kept in a form which permits identification of data subjects for longer than is necessary for the purposes for which the data were collected or for which they are further processed. Member States shall lay down appropriate safeguards for personal data stored for longer periods for historical, statistical or scientific use. (art. 6) When sensitive personal data (including religious beliefs, political opinions, health, sexual orientation, race, membership of past organisations) are being processed, extra restrictions apply. (art. 8)

The Data Protection Directive of 1995 was complemented in 2002 (Directive 2002/58/EC), with particular respect to the processing of personal data in the electronic communication sector. It applies to all matters which are not specifically covered by the 1995 Directive. The main provision made in the 2002 Directive concerns the duty of electronic communication providers is to ensure security of services (art. 4). This obligation also includes the duty to inform subscribers whenever there is a particular risk, such as a virus or other malware attack (art. 4.2). Another provision concerns maintenance of confidentiality of information. Here the

addressees are Member States, who should prohibit listening, tapping, storage or other kinds of interception or surveillance of communication and related traffic unless the users have given their consent or specific conditions (art. 15.1) have been fulfilled.

In January 2012, The European Commission put forward its EU Data Protection Reform (IP/12/46) [5]. In December 2015, an agreement was found with the European Parliament and the Council, following final negotiations between the three institutions (so-called 'trilogue' meetings). On 8 April 2016 the Council adopted the Regulation and the Directive. And on 14 April 2016 the Regulation and the Directive were adopted by the European Parliament. The official texts will shortly be published in the Official Journal of the European Union in all official languages. The new rules will become applicable two years thereafter. The new rules are expected to have a number of impacts on social networks and thus deserve attention by WeGovNow right from the beginning, although they will become effective only in two years time from now. For instance, providers will have to take account of the principle of 'data protection by default', which means that the default settings should be those that provide the most privacy.

Directive 2000/31/EC

The so called e-Commerce Directive defines rules for the provision of so called Information Society Services, both within and between Member States. Although WeGovNow does not intend to develop an e-Commerce platform provisions made by this Directive might be relevant to the project, e.g. when it comes to liability issues, as services that could potentially be delivered through the WeGovNow platform might be regarded as Information Society Services.

5.3.3 eSignature

Directive 1999/93/EC

This Directive establishes the legal framework at European level for electronic signatures and certification services [6]. The aim is to make electronic signatures easier to use and to help them become legally recognised within the Member States. The Directive has introduced two new concepts: the advanced electronic signature and the qualified certificate. The main provision is that an advanced electronic signature based on a qualified certificate satisfies the same legal requirements as a handwritten signature. It is also admissible as evidence in legal proceedings. Furthermore, this Directive lays down the criteria that form the basis for legal recognition of electronic signatures by focusing on certification services, namely: common obligations for certification service providers; common rules on liability to help build confidence among users; and cooperative mechanisms to facilitate trans-border recognition of signatures and certificates with third countries.

The Regulation (EU) No 910/2014

The EU Regulation on electronic identification and trust services for electronic transactions in the internal market (the so called eIDAS Regulation) adopted by the co-legislators on 23 July 2014 aims at enabling secure and seamless electronic interactions between businesses, citizens and public authorities. The eIDAS Regulation, which is based on the Commission Communication (COM (2012) 238 final of 4 June 2012), is expected to increase the effectiveness of public and private online services, eBusiness and electronic commerce in the EU. The aim is to:

- ensure that people and businesses can use their own national electronic identification schemes (eIDs) to access public services in other EU countries where eIDs are available.
- create a European internal market for eTS by ensuring that they will work across borders and have the same legal status as traditional paper based processes. It is assumed that only by providing certainty on the legal validity of all these services, businesses and citizens will use the digital interactions as their natural way of interaction.

This regulation will repeal Directive 1999/93/EC with effect from 1 July 2016. It enhances and expands the acquis of Directive 1999/93/EC.

5.3.4 Re-use of Public Sector Information (PSI)

Directive 2003/98/EC

The term Public Sector Information (PSI) refers to documents, databases and other information produced, collected and stored by public sector bodies. The Directive sets out a framework for the conditions of its reuse and aims to ensure equal treatment for commercial editors within the internal market. Public sector organisations authorising this type of reuse continue to hold copyright and related rights. They are, however, invited to exercise their copyrights in a way that facilitates re-use.

Directive 2013/37/EU

This Directive of 2003 was amended by Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 on the re-use of public sector information. The latter lays down a clear obligation for Member States to make all documents re-usable unless access is restricted or excluded under national rules on access to documents and subject to the other exceptions laid down in this Directive. The amendments made by this Directive do not seek to define or to change access regimes in Member States, which remain their responsibility. In addition, the scope of Directive 2003/98/EC is to be extended to libraries, including university libraries, museums and archives.

5.3.5 eAccessibility

Over the last decade, the concept of eAccessibility has become a visible theme in EU Information Society policy and increasingly also in EU disability policy, where the importance of this concept has been enhanced since the ratification of the UN Convention on the Rights of Persons with Disabilities [7]. According to European Commission the concept of eAccessibility “refers to initiatives taken to ensure that all citizens have access to Information Society services. This is about removing the technical, legal and other barriers that some people encounter when using ICT*-related services. In particular, it concerns people with disabilities and certain elderly people” [8]. More recently, a particular focus of European-level policy development has been given to Web accessibility in particular. On 3rd December 2012 the European Commission adopted a proposal for a Directive on the accessibility of the public sector bodies' websites [9]. Following reading in the European Parliament, the e so-called trilogue negotiation procedure is still ongoing. It can however be expected that the Directive will come into force during the lifetime of the WeGovNow project, and that it will subsequently be transposed into national legislation in the Member States. According to the draft Directive it can thus be expected that public online services will in the foreseeable future have to comply with the Web Accessibility Guidelines of the W3C Consortium, namely WCAG 2.0 level AA [10].

5.3.6 Ethics approval

At the European level, formal ethics approval procedures are currently regulated by Directive 2001/20/EC, the so called Clinical Trial Directive. This directive will soon be superseded by a new Clinical Trials Regulation (CTR) EU No 536/2014 which will become applicable on 28 May 2016. With a view to enforcing compliance with the rules set out in the Clinical Trial Directive of 2003, Member States are required to implement Ethics Committees. In relation to each trial that falls within the scope of the Directive, among other things, they have the duty to express an opinion on the clinical trial protocol, the suitability of the investigators involved in the trial and the adequacy of facilities, and on the methods and documents to be used to inform trial subjects and obtain their informed consent. According to European-level regulation a formal ethics approval is legally required only for clinical trials. As it is not intended to conduct a clinical trial, a formal ethics approval does not seem to be required according to EU-level regulation.

In WeGovNow consortium, partners might have their own internal Ethics approval process. For example, research projects at UCL are required to go through an Ethics approval process, in particular when the projects involve working with groups of citizens and local stakeholders. As part of WeGovNow, UCL will apply for ethics

approval where this is necessary and will ensure that our procedures comply with UCL Research Ethics Committee guidelines.

The application process is detailed in [11], and the terms of reference for the Ethics Committee can be found in [12].

5.4 Directives and regulations for web accessibility

In the last years, a confluence of a series of key initiatives in the field of web accessibility is happening:

- the ratification of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) by the EU in December 2010,
- the progressive adoption of Web Content Accessibility Guidelines 2.0 across Member states,
- the finalisation of the work on standardization mandate 376 to incorporate accessibility in public ICT procurements (February 2014) and the publication of the European Standard on Accessibility of ICT products and services in public procurement (EN301549)¹³,
- the European Commission's proposal of 3 December 2012 for a Directive on the accessibility of the public sector bodies' websites¹⁴.

Both the proposed directive on the accessibility of the public sector bodies' websites and the new standard for procurement (EN301549) points to WCAG 2.0 level AA. The interface developed within the WeGovNow project therefore must comply with this standard to be possible to use in municipalities within the EU in the future.

5.5 Legal requirements in pilot municipalities

5.5.1 The case in Italy

We must assess the legal implications of WeGovNow in terms of compliance with data protection and privacy law. Three phases characterised the work undertaken: the analysis of the project, the identification and solution of legal issues.

During the analysis phase, it will be understood in detail - through a constant dialogue with projects' developers and administrators - which personal data have to be collected, in which way and how they had to be processed and stored.

During the second phase, the existing legislation will be studied in the light of the most recent guidelines of the Italian Authority for the protection of personal data and analogous institution in the UK. This will prepare for the third stage, i.e.

¹³ www.etsi.org/deliver/etsi_en/301500_301599/301549/01.01.01_60/en_301549v010101p.pdf

¹⁴ <https://ec.europa.eu/digital-single-market/en/news/proposal-directive-european-parliament-and-council-accessibility-public-sector-bodies-websites>

identification of legal steps to be taken in order to carry out the project in compliance with the relevant legal obligations.

Among the issues to be considered are the following:

- a) the project' web application has to comply with the national legislation on cookies;
- b) the collection of personal data (carried out electronically when registering on the websites and on paper, in schools, as happened with Librare) has to be carried out in accordance with the existing laws;
- c) the need to carry out a notification to the Italian Authority for the protection of personal data;
- d) the drafting of adequate terms of use.

In the third phase, in cooperation with the legal staff of the University of Torino, the documents needed to lawfully carry out the project were drafted.

The following documents have to be prepared:

- a) an adequate informative note on the use of cookies;
- b) a disclaimer for the collection and processing of personal data to be signed, on paper, prior to the data collection in schools;
- c) an on-line informative privacy document to be read and accepted at the time of registration;
- d) terms of use of the social network;
- e) notification to the Italian Authority for the protection of personal data;
- f) a descriptive document on the obligations (also the technical) that had to be fulfilled for the processing of the collected personal data;
- g) a descriptive document, for internal use, indicating the data controller, the data processors and, if appointed, the persons entitled of carrying out the processing.

Data Protection & Privacy

In 1996, the Italian Data Protection Act was enacted to implement the European Union Data Protection Directive. The Data Protection Code of 2004 replaced the previous Data Protection Law (Law no. 675/1996), as well as a number of other legislative and regulatory provisions [13]. The Data Protection Code updates, completes and consolidates Italy's data protection legislation (1996) by introducing various innovations and conforming national legislation to European regulations, in particular the Data Protection Directive (95/46/EC) and the Directive on privacy and electronic communications (2002/58/EC). The code aims to strengthen the data protection rights of individuals, allowing them to exercise their rights and instigate

proceedings more easily. The Code was lastly amended on 4 November 2010. The Data Protection Commissioner ('Garante Privacy') is in charge of supervising and enforcing the application of the Data Protection Code. In an effort to simplify the complaint process, the Commissioner has published a complaints' form on its website.

Freedom of Information

Chapter V of Law n. 241/90 of 7 August 1990 provides for a limited right of access to administrative documents. Public bodies must respond to a request for administrative documents within 30 days. Information can be withheld when it relates to (a) security, national defence and international relations; (b) monetary and foreign exchange policy; (c) public order, prevention and repression of crime; and (d) privacy of third parties. Appeals can be lodged to a regional administrative court, whose decisions can be appealed to the Council of State.

eSignature

Rules regarding the use of electronic signatures and documents were regulated in a series of presidential and government decrees adopted between 1997 and 2001 [13]. Legislative Decree no. 10 of 23 January 2002 brought the Italian electronic signature regulations in line with the Directive 1999/93/EC on a Community framework for electronic signatures. Most recently, the eGovernment Code of 2005 regulates electronic signatures and confirms their full legal validity. The Italian signature known as 'firma digitale' (digital signature) is compliant with the 'qualified signature', as in the Directive 1999/93/EC.

Re-use of Public Sector Information (PSI)

The legislative decree no. 36 of 2006 has transposed the EU Directive on the re-use of public sector information (Directive 2003/98/EC). The Italian Government drafted an amendment to the Legislative Decree 24 January 2006, No. 36 on the re-use of documents in the public sector that transposes the re-use of public sector information Directive 2003/98/EC correctly, following controversy on the correct transposition of the Directive on PSI re-use in Italy.

eAccessibility

The Italian legislation about accessibility has been based on the Stanca Act (Law n. 4, January 9, 2004) making provisions to support the access to information technologies by people with disabilities, and on various subsequent technical decrees including the following [14]:

- Decree of the President of the Republic, March 1st 2005, No. 75 which introduces the key concept of usability. Web sites must not only be barrier-free but also simple, effective, efficient and they must satisfy the user's needs.

- Ministerial Decree, July 8 2005 which contains the technical Web accessibility requirements, the methodology for the evaluation of Web sites and the requirements for accessible hardware and software.

More recently, the Decree no. 179 of 18/10/2012 (converted into Law 221 of 17/12/2012) extended the Stanca Law to all subjects who receive government grants or subsidies for the provision of information services via the Internet. It introduced new obligations for public administrations and gave to the Italian digital Agency the task to control and update the technical rules according to the international standards of reference. Article 9 refers to digital inclusion. It obliges public authorities to publish on their websites annual goals of accessibility. It also assigns to the Italian Digital Agency the task of monitoring and intervention on providers of public services. The Italian Digital Agency with the note 61/2013 has defined in detail the obligations of Public Administrations, providing a questionnaire that the Public Administrations can use to perform a self-assessment on the state of adaptation of its web sites and web services to the legislation on accessibility.

Formal Ethics Approval

In Italy there are Ethics Committees at national and regional /local levels, with a focus on overseeing the conduction of clinical. According The EU Directive 2001/20/EC concerning the implementation of good clinical practice in the conduct of clinical trials on medicinal products for human use was transposed into national law by means of Legislative Decree 24 June 2003, No. 211 [15].

5.5.2 The case in the UK

Data Protection and Privacy

The UK data protection act 1998 (DPA) requires University College London to ensure that personal data is used in a way that is fair to individuals and protects their rights. In this context personal data is data from which a living individual can be identified. In addition, it also defines the following as sensitive information and requires us to get specific consent in writing if we process this type of data:

- Racial or ethnic origin
- Political opinions
- Religious beliefs
- Trade union membership
- Physical or mental health
- Sexual life
- Commission of offences or alleged offences

We are also required to keep watch for data that could be considered “contextually sensitive” - i.e. data that is innocuous on its own but can be used to identify a person if combined with other data that you’ve collected.

Should data subject to Data Protection restrictions be required to be stored by UCL within the WeGovNow project, we will follow the requisite UCL procedures in this regard, which include applying for a Data Protection Registration Number, which in turn is required for Ethics Approval (see below). Further information is available in [21].

Moreover, the Digital Economy Act (2010) concerns the online infringement of copyright [16]. It creates a system which aims to increase the ease of tracking down and suing persistent infringers, and after a minimum of one year permit the introduction of 'technical measures' to reduce the quality of, or potentially terminate those infringers' Internet connections. It furthermore creates a new ex-judicial process to handle appeals.

Freedom of Information

The Freedom of Information Act 2000 (FOIA) came fully into force on 1 January 2005 [17]. It provides statutory rights for any member of the public to apply for access to information held by bodies across the public sector, together with an enforcement regime. A new Information Commissioner's Office and an Information Tribunal, with powers to enforce the rights created, were established by the Act, along with a duty imposed on public authorities to adopt a scheme for the publication of information. The legislation applies to a wide range of public authorities, including parliament, government departments, local authorities and other entities in England, Northern Ireland and Wales. Scotland has a specific Freedom of Information (Scotland) Act 2002, which makes provision for the disclosure of information held by Scottish public authorities.

eSignature

The Electronic Communications Act 2000 creates a legal framework for the use of electronic signatures in the public and private sectors. It is complemented by Electronic Signatures Regulations (2002), which implements in UK law the European Directive on a Community framework for electronic signatures (1999/93/EC).

Re-use of Public Sector Information (PSI)

The Re-use of Public Sector Information Regulations 2015, which came into force on 18 July 2015, implements into UK law the European Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 on the re-use of public sector information (PSI Directive).

eAccessibility

Accessibility of public websites is covered by the Equality Act 2010 which came into force on the 1st October 2010 [18]. The Act identifies eight protected characteristics, including disability and makes it unlawful to discriminate either directly or indirectly against persons because of a protected characteristic. Interpretation of the provisions of the Act is supported by a number of statutory Codes of Practice and non-statutory guidance. There are general provisions in Part 3 of the Act relating to 'Services and public functions' that make it unlawful for anyone concerned with providing such services to the public (whether in private public and voluntary sectors), to discriminate against a person or persons (because of a protected characteristic) in their delivery of those services. The Act also imposes a positive duty (Sections 20 and 29(7)) on the service provider to make reasonable adjustments to ensure that persons with a disability can access services and is 'anticipatory' as it requires service providers to anticipate the need for reasonable adjustments of not just existing, but also potential disabled customers.

Moreover, there are explicit references to the provision of services via web sites in the Equality Act 2010 Statutory Code of Practice (Services, public functions and associations) which contains (11.8) an example of reasonable adjustments in the provision of information by a local public council via its website. Guidance from the Equality and Human Rights Commission (EHRC) on the Act also explicitly mentions the provision of web and internet services as being covered by the Act. Especially for websites, there is guidance from the UK Cabinet office on the minimum standard of accessibility of public sector websites which, inter alia, requires the minimum standard of accessibility for all public sector websites as WCAG AA and compliance with the WCAG is acceptable at Level Double-A of version 1.0 or the equivalent level in version 2.0. These minimum requirements are also referenced in guidelines issued by the UK Central Office of Information ('COI') (TG102 - last updated in October 2009). Although the COI closed in March 2012, these guidelines do not appear to have been replaced.

In addition to the legislation, generic government policy on web accessibility is set out in the eAccessibility Action Plan, developed by the eAccessibility Forum, a coalition of UK Government, charity and private sector organisations, published by the Department of Culture Media and Sport Culture ('DCMS') and is described as being the Government 'action plan to support the improvement of public websites, IT equipment and online content to suit the needs of disabled people' and section 3.1 deals with the development and maintenance of eAccessibility of public sector online services.

Formal Ethics Approval

When it comes to clinical research, the European Directive (2001/20/EC) was transposed into UK law by means of The Medicines for Human Use (Clinical Trials)

Regulations 2004 and subsequent amendments [19]. Apart from this, all research proposals involving living human participants and the collection and/or study of data derived from living human participants undertaken by UCL staff or students on the UCL premises and/or by UCL staff or students elsewhere requires ethical approval to ensure that the research conforms with general ethical principles and standards. [20] The UCL Committee is responsible for considering the ethics of human research (e.g. physical, psychological, attitudinal) carried out by UCL staff or students on the UCL premises and/or by UCL staff or students elsewhere. It is not responsible for considering the ethics of research which falls under the remit of Department of Health approved ethics committees who abide by Governance Arrangements for NHS Research Ethics Committee.

5.6 We GovNow Licensing

Special considerations need to be taken relating to the Open Source licenses of the involved software components. Viral licenses (such as the GNU General Public License (GPL), GNU Affero General Public License (AGPL), and possibly GNU Lesser General Public License (LGPL)) must be “quarantined” in such way that code licensed under such conditions does not infect any other code that is being developed by the other project partners.

A viral license is a license which imposes restrictions on combined work under certain circumstances. The borderline between derivation and combination with different levels of separation (isolation through different kinds of programming interfaces) isn't always clear and may differ for each jurisdiction and even be decided by judges in particular cases. Conflicting license demands may result in unusable source code.

Therefore, the “quarantine” requires strict tracking of all source code affected by viral licenses as well as clear definitions of interfaces to/by such software components in order to avoid mistakes that could render the overall software product unusable and to avoid unnecessary constraints that may prohibit future recombination of work. Where possible, permissive licenses will be granted to the public.

6 Conclusions

This report has provided operational specifications of concept, methods and procedures to be applied for the purposes of the WeGovNow project in relation to research & innovation aspects, usability and e-accessibility aspects as well as legal, data protection and ethical aspects. The consolidated framework will help in ensuring exploitability of project outcomes by relevant stakeholders beyond the immediate project duration. This document covered the early conceptual phase of

WP1 that feeds all subsequent WPs in terms of consolidated descriptions of concepts and methods to be applied.

It is worth pointing out that the concepts and corresponding architecture that is presented in this document, as well as any legal, data protection and ethical aspects is expected to be revised several times during WP1 lifetime, as further discussions with the project stakeholders take place, and as further progress is achieved in terms of research. For this reason, this document will periodically be updated until its second major release as D1.2, due in M12.

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8 Appendix A: Lists of accessibility requirements both in regard of concept & design, and techniques

8.1 Facts about the requirements

Project name:	WeGovNow © These requirements are only to be used in the context of the WeGovNow project. For use outside the project or for the right to publish these requirements, please contact Funka.
Reference:	Andreas Cederbom andreas.cederbom@funka.com Phone: +46 8 555 770 64
Date:	21.04.2016

8.2 Background

These requirements are developed by Funka Nu AB (Funka) to be used in the project WeGovNow. Funka's methodology has been developed in close co-operation with the Swedish disability movement, and everything we recommend has been tested by actual users in realistic settings. Our work builds upon the international guidelines for accessibility, Web Content Accessibility Guidelines 2.0 (WCAG 2.0). However, Funka's long experience with accessibility work and testing with users that have different needs and abilities, with and without assistive technology, has made it clear that WCAG 2.0 is not enough. We have therefore developed our own test criteria that complement the international guidelines, which are the basis for all domestic legislation on accessibility.

Commissioned by the World Wide Web Consortium (W3C), Funka conducted the authorised translation of WCAG 2.0 into Swedish.

- [Web Content Accessibility Guidelines 2.0 \(WCAG 2.0\)](#)
- [The authorised Swedish translation of WCAG 2.0](#)
- [World Wide Web Consortium \(W3C\)](#)
- [Web Accessibility Initiative \(WAI\)](#)

Read more about Funka on www.funka.com.

8.3 About the requirements

These accessibility requirements are based on WCAG 2.0 but go significantly further in many areas, and also specify in detail how the WCAG 2.0 requirements should be solved.

8.3.1 Notation

The requirements are classified according to the following notation:

- **Critical:** The requirement must be met.
- **Basic:** The requirement must be met. Singular exceptions can be made as long as they are well motivated and documented.
- **Additional:** The requirement should be fulfilled, but can be exempted if it proves to be too expensive, demanding or impractical to fulfil.

8.3.2 WCAG 2.0

Many of the requirements are connected to one or more criteria in WCAG 2.0. If such a connection exists, it is specified in the column “Reference to WCAG 2.0”.

The figure in parenthesis is the requirement’s priority level. 1 means level A, 2 is level AA, and 3 is level AAA.

8.3.3 Affected parties

This describes who is primarily responsible for fulfilling each requirement:

- **Designers:** The requirement can be fulfilled through good interaction design and/or graphical design.
- **Developers:** The requirement is fulfilled through good code, development and implementation.
- **Authors:** The requirement is fulfilled through good day-to-day publishing practices.

Note: In the requirements the term “website” is used to refer to the system.

8.4 Lists of accessibility requirements

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
Technical accessibility								
Technologies								
T1a	Use technologies that are accessibility supported Not all technologies can be made accessible. Avoid for instance Java-applets and Flash. Feel free to use HTML, CSS and JavaScript.	Critical		Developers				
T1b	The HTML code is based on a standard and follows it Define the chosen standard with !DOCTYPE, and follow it as far as it is possible. Exceptions caused by attributes that don't exist in the standard, but are used by the CMS or a specific functionality are allowed, but have to be motivated and documented. None of the exceptions specified on success criteria 4.1.1 in WCAG are allowed.	Basic	4.1.1 (1) 4.1.2 (1)	Developers				
T1c	The CSS code is based on a standard and follows it Also avoid browser-specific solutions used to achieve the same presentation in all browsers.	Basic		Developers				
T1d	Character encoding is set correctly	Basic		Developers				
Separation of content and presentation								
T2a	CSS is used for all presentation This includes decorative images.	Basic	1.3.1 (1) 1.4.8 (3)	Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
T2b	Layout tables are not used No exceptions. Complex forms may be partially table-based, but only as actual data tables with table header cells.	Basic		Developers Authors				
T2c	The content is organized so that it is readable without CSS It does not mean that the presentation has to be entirely without issues. For instance, it can be acceptable if the menu is displayed twice, if it is required for good functionality on mobile devices.	Basic	<u>1.3.2</u> (1)	Developers				
Interface flexibility								
T3a	The interface works well on different screen widths The interface should be build using responsive techniques so that it adapts to the screen width automatically. The mobile version of the menu should not be visible at least until portrait mode on iPad, but preferably not until landscape mode on mobile phones. Icons for menu and search should be supplemented by visible text "Menu" and "Search".	Basic		Designers Developers				
T3b	All information and functionality is possible to access and use regardless of screen size	Basic		Developers				
T3c	The website is fully usable and readable when using zoom The zoom functionality in browsers must work on the website. Having a different setting than "Normal" selected in the Internet Explorer menu "Show > Text size" should not cause visual problems.	Basic	<u>1.4.4</u> (2) <u>1.4.8</u> (3)	Developers				
T3d	Images should be adapted on the server for different screen widths	Additional		Developers				
Frames								
T4a	Minimize the use of frames Frames should preferably not be used at all. If they are, the use must always be motivated.	Basic		Developers				
T4b	The purpose of every frame is described in the title attribute	Basic	<u>4.1.2</u> (1)	Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
Scripts								
T5a	Use scripts to enhance the user experience For instance, it should be possible to submit a form even though script is blocked. Scripts may be used for live validation when the form is filled out, but even if script is blocked it should be possible to post the form (without the live validation).	Additional		Developers				
T5b	Basic functionality like menus and search functions work without script This also applies to the mobile interface, meaning that the mobile menu must still function if scripts are disabled.	Additional		Developers				
T5c	There is relevant information for users whose equipment is blocking script If additional software or plugins are required, they must also be accessible, and the user must be provided with a download link. The user must also be given information why certain parts of the website may not work, and how they might access the same information/functionality in other ways.	Basic		Developers				
T5d	Scripts do not cause problems for users with assistive technology Complex technologies and systems should at a minimum be tested with the screen readers Jaws for Windows (Internet Explorer) and VoiceOver for iOS (Safari). Additional testing needs should be discussed from case to case.	Basic	4.1.2 (1)	Developers				
T5e	When new elements are inserted into the page, they are placed correctly both visually and structurally	Basic	1.3.2 (1) 2.4.3 (1)	Developers				
T5f	Use aria-expanded for areas that expand and collapse Links and buttons that expand an area without reloading the page must use the WAI-ARIA attribute aria-expanded to show whether the area is currently expanded or collapsed.	Basic	4.1.2 (1)	Developers				
Navigation								
T6a	All functionality can be controlled with mouse, keyboard and touch screen	Basic	2.1.1 (1) 2.1.2 (1)	Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	The interface does not require precise timing from the user to navigate it. The user can navigate out of all functions and components regardless of which input device he/she uses.		2.1.3 (3) 3.2.1 (1) 3.2.2 (1) 3.2.5 (3)					
T6b	The tab order is logical	Basic	2.4.3 (1)	Developers				
T6c	Focus is clearly visible when the user navigates using keyboard and mouse This applies to text links, image links and form objects, and should be controlled using CSS. See www.sr.se and www.fmv.se for good examples.	Basic	2.4.7 (2)	Developers				
T6d	Clickable areas are easy to hit The exact size requirements vary from case to case, but as a base rule, the height should be at least one normal line height and the width at least three line heights, or vice versa. It is not necessarily a problem if a clickable object is comparatively small; the problem occurs when there are several clickable objects close to each other.	Basic		Developers				
T6e	New windows and popups are not opened unless the user requested it This includes dynamic layers containing (for instance) website surveys that suddenly appear when the user has loaded a third or fourth page on the website.	Basic	3.2.1 (1)	Developers				
T6f	The user's focus is directed to new content or new areas when these are opened This must also include users with assistive technology, such as users with severe visual impairment.	Basic	2.4.3 (1)	Developers				
T6g	Related links and information areas are grouped The elements should be grouped both visually on the page and in the code structure. For example, make sure that the gap between main menu and sub menu is not too big. HTML5 elements are used for navigation <nav> and main content <main>. WAI-ARIA roles are used for search functions.	Additional		Developers				
T6h	Shortcut links for faster keyboard navigation are implemented The shortcut is visually hidden until it receives focus, either through tab navigation or through an access key, after which it becomes visible. At a minimum, there must be a shortcut from the start	Basic	2.4.1 (1)	Developers				

No	Description	Notation	Reference WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	of the page down to the main content area, skipping navigation and other global functions in the page header.							
T6i	Access keys are implemented	Additional		Developers				
	Automatic events							
T7a	Automatically updating pages are only used under special circumstances Automatic full page reloads should not be used. However, dynamically updating content on the page is OK, as long as it does not exclude or cause problems for users with assistive technology.	Basic	2.2.3 (3) 2.2.4 (3)	Developers				
T7b	There is no client-side automatic forwarding of visitors Forwarding is acceptable if the time is set to 0.	Basic	2.2.3 (3) 2.2.4 (3)	Developers				
T7c	Time limits are only used under special circumstances	Basic	2.2.3 (3) 2.2.4 (3)	Developers				
T7d	If automatic events or time limits are used, the user is informed in advance If it is at all possible to let the user request more time, it should be offered.	Critical	2.2.1 (1) 2.2.2 (1) 2.2.4 (3) 3.2.5 (3)	Developers				
T7e	If automatic events or time limits are used, the user can extend the time interval	Additional	2.2.1 (1) 2.2.2 (1) 2.2.4 (3)	Developers				
T7f	If automatic log off is used, user input must as far as it is possible be saved so that the user can continue at next login	Additional	2.2.5 (3)	Developers				
T7g	If an area is updated dynamically without the page reloading, it must be marked using the WAI-ARIA attribute aria-live Use the following values: <ul style="list-style-type: none"> • Off = Use for frequently updating information, such as live stock quotes. • Polite = Use for updates that can be communicated to the user when he/she is not busy. • Assertive = Use when something important happens that the user needs to be notified of immediately. 	Basic	4.1.2 (1)	Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
Coding of forms								
T8a	Form objects are coded with the correct form code For instance, avoid creating buttons out of div or a-elements with role="button".	Basic	1.3.1 (1) 4.1.2 (1)	Developers				
T8b	Labels are connected to corresponding form objects Use the label element. If the website is coded in HTML5, the form objects must have the correct type value to ensure a better experience with on-screen keyboards.	Critical	1.3.1 (1) 2.4.6 (2) 3.3.2 (1) 4.1.2 (1)	Developers				
T8c	Form sections are grouped Use fieldset and legend when there are groups of radio buttons, check boxes or other logical groups of form objects.	Basic	1.3.1 (1)	Developers				
T8d	Error messages are coupled with corresponding form objects	Basic	1.3.1 (1)	Developers				
The use of structural elements								
T9a	Heading elements are used to convey the document's information structure with the proper hierarchy The first heading of the page must be an h1, and should be the main heading of the page-specific content.	Critical	1.3.1 (1) 2.4.10 (3)	Developers Authors				
T9b	Lists are coded and used correctly	Basic	1.3.1 (1) 3.1.3 (3)	Developers Authors				
T9c	Paragraphs are created with the p element and used correctly	Basic	1.3.1 (1)	Developers Authors				
T9d	Quotes are marked with q or blockquote elements	Additional	1.3.1 (1)	Developers Authors				
T9e	Abbreviations are explained using the abbr element Ideally, abbreviations should be avoided entirely. If they absolutely must be used, they should be written out in full when they first occur in the text. The abbr element should then be used for all remaining instances.	Additional	1.3.1 (1) 3.1.4 (3)	Developers Authors				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	Abbreviated weekdays in a calendar should always use abbr to make them easier to understand.							
The construction of data tables								
T10a	Table headings are created using th and caption	Critical	<u>1.3.1</u> (1)	Developers Authors				
T10b	Table cells are used for table data only For instance, image captions should not be placed within a table cell. This is a separate concern from the use of tables for layout purposes (see requirement T2b).	Basic		Developers Authors				
T10c	Complex tables are complemented with relevant HTML code When the table cells contain multilevel headings, each heading must be given a unique id-value, and each table cell must declare its headings using the attribute header.	Basic	<u>1.3.1</u> (1)	Developers Authors				
Link implementation								
T11a	Links are implemented so that they are visible regardless of how the user has set up their browser.	Critical		Developers				
Text								
T12a	Text is presented as text and not as images of text Exceptions can be made for: <ul style="list-style-type: none"> Items on the landing page promoting information further down in the structure, as long as it is possible to reach the same information through other links or menus. Illustrations Flow charts Diagrams Logotypes If an image is partly made up of text, such as in the case of diagrams or flow charts, a version of	Basic	<u>1.4.5</u> (2) <u>1.4.9</u> (3)	Developers Authors				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	that image must be made available in which the text is at least twice the website's normal text size.							
Descriptions of images								
T13a	A text equivalent is provided for every meaningful graphical element on the website	Critical	<u>1.1.1</u> (1)	Developers Authors				
T13b	Image maps are client-side and have textual descriptions for both links and images	Basic	<u>1.1.1</u> (1) <u>2.4.4</u> (1) <u>2.4.9</u> (3)	Developers Authors				
Sound management								
T14a	Information that is presented through sound is also explained in text There must be a short text describing the contents of the audio file or broadcast. The corresponding information must also be available as text and clearly reachable in connection to the audio file or broadcast. Exceptions from this rule can in some cases be made for live broadcasts.	Basic	<u>1.2.1</u> (1) <u>1.2.8</u> (3) <u>1.2.9</u> (3)	Authors				
T14b	Background sound is easy to turn off manually, or turns off automatically within 3 seconds	Critical	<u>1.4.2</u> (1)	Developers Authors				
Managing complex media formats (e.g. pdf and film)								
T15a	There are appropriate text descriptions for all information presented through complex media formats For film and animated illustrations, the equivalent information must be provided in text form. This satisfies all the referenced WCAG requirements. For films that are permanent or semi-permanent on the website, there must also be subtitles for all audio information. For links to files such as PDF documents, the link text must specify the file's content, format and size (if greater than 1MB).	Basic	<u>1.1.1</u> (1) <u>1.2.1</u> (1)	Authors				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
T15b	Information that is presented through the use of complex media formats has passed an accessibility review Film and PDF documents are also covered by WCAG 2.0. Therefore, you should make sure that such materials are also accessible. When using film, this includes captioning the video and providing an audio description if necessary.	Basic	<u>1.2.2</u> (1) <u>1.2.3</u> (1) <u>1.2.4</u> (2) <u>1.2.5</u> (2)	Authors				
T15c	The user can choose between at least two different quality settings when streaming media	Additional		Developers				
T15d	Films are offered in an image quality that is relevant for their purpose Colors and contrasts	Additional		Authors				
T16a	The website does not block the user's ability to set their own preferences regarding colors and fonts in the browser As far as it is possible, the user should be able to use the settings panel in Internet Explorer and Firefox to override the website's colors and fonts and substitute them according to their own preferences. Note that a full substitution may not always be possible in Internet Explorer. Interface motion	Additional	<u>1.4.8</u> (3)	Developers				
T17a	The website is presented without annoying flickering or moving and blinking elements that cannot be turned off. All movement on the website must be possible to stop using both mouse and keyboard. Description of pages	Basic	<u>2.2.2</u> (1) <u>2.3.1</u> (1) <u>2.3.2</u> (3)	Developers Authors				
T18a	The pages have unique and relevant page titles	Basic	<u>2.4.2</u> (1)	Developers				
T18b	Metadata provides relevant information about the page and the website This requirement should be evaluated on a case-by-case basis. However, as a minimum rule, the attribute "description" should be used.	Additional		Developers Authors				
T18c	The main language of the page is defined in the source code	Basic	<u>3.1.1</u> (1)	Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	The language is defined with the attribute <i>lang</i> within the html element.							
T18d	Content in languages other than the main language of the page is marked down	Basic	<u>3.1.2</u> (2)	Developers Authors				
T18e	If instructions exist for how users with assistive technology should use a certain feature on the website, those instructions should be closely coupled with the feature Use the WAI-ARIA attribute aria-describedby to couple explanations to their corresponding elements. For example, use it to associate an extended description or help text to a specific form object. It should also be used to couple specific instructions for users with screen readers to the function that the instructions concern.	Additional		Developers				

Pedagogic accessibility

Start page

P1a	It is easy to identify the originator of the interface This must be apparent through text, metadata and a logotype. In this context it is the organization using the system that must be presented, not the company developing the system.	Critical		Developers Designers				
P1b	The overall purpose of the website is easy to understand	Basic		Designers				
P1c	The start page helps the user understand what is important	Basic		Designers Authors				

General rules

P2a	The website does not feel confusing	Basic	<u>2.4.8</u> (3)	Designers				
P2b	The websites design and appearance confirms the users expectations of how it should look and function	Basic		Designers				

Logic

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
P3a	The design and placement of objects helps the user understand the content Among other things, this means that: <ul style="list-style-type: none"> The menu clearly shows the user's current location Elements and functions make it obvious what they are, i.e. it is easy to identify their purposes. The same function does not change location in different sections of the website Text that is not a link is never underlined Elements that are not links do not look as if they are links Search results are laid out in a clear and understandable way It is obvious to the user if the current page is part of a larger flow or collection of pages The page does not use Captcha 	Basic	<u>1.3.3</u> (1) <u>3.2.3</u> (2) <u>3.2.4</u> (2)	Designers Developers				
P3b	Different services and sections of the website interact with the user in a consistent way This means that the terminology that is used for features and links, and the order that for instance menu items are presented, is consistent throughout the site.	Basic	<u>3.2.3</u> (2) <u>3.2.4</u> (2)	Designers Developers				
P3c	When the user believes he is doing the same thing, the result is also the same	Basic		Developers Authors				
P3d	Different links that lead to the same page share the same name	Additional	<u>3.2.4</u> (2)	Developers Authors				
Understandability								
P4a	The navigation is intuitive	Basic		Designers				
P4b	As far as it is possible, content changes and updates take place after (below) the user's current location on the page As an example, search results should be presented visually below the search function, and inserted directly after the search function in the code structure.	Basic	<u>1.3.2</u> (1)	Designers Developers				
P4c	The user is made aware of changes as they happen This must be done visually and, when appropriate, also with sound. The more important the	Basic		Designers Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	event, the more obvious should the visual notification be, and its sound. Frequently updating information, such as live stock quotes, can use more discrete notifications so as not to disturb the user.							
P4d	The user receives relevant feedback Examples of this include, for instance, a visual indication of the system's current state, a confirmation that a recent user action was correct, or an clearly worded error message.	Critical		Designers Developers				
P4e	The active page must never contain a link to itself This does not apply to links that change the content of the active page, or moves the user's focus within the page. The link or button must either change something on the page or the context.	Additional		Developers				
P4f	New browser windows are only created if they increase user benefits	Basic		Designers Authors				
P4g	Clickable objects are clearly visible and readable	Basic		Designers				
P4h	The understandability of instructions and directions is not dependent on the user's ability to see or hear Menu structure	Critical	<u>1.3.3</u> (1)	Authors				
P5a	The number of top-level choices in the menu is well balanced	Basic		Designers Authors				
P5b	The relationship between the depth and width of the menu structure is well balanced	Basic		Designers Authors				
P5c	The menu structure reflects only the information structure The menu must not contain direct links to other websites, disparate interfaces or global functions such as, for instance, contact information.	Basic		Designers Authors				
P5d	The menu structure reflects user expectations of how the content should be structured	Additional		Designers Authors				
P5e	Menus have been set up according to a thought-out sorting order	Additional		Designers Authors				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
Search functionality								
P6a	A search function exists, except for special reasons	Critical	2.4.5 (2)	Designers				
P6b	Searching yields relevant results There should also be mechanisms in place that handle spelling mistakes and synonyms.	Basic		Developers				
P6c	The search function is positioned high on the page The function must be available on, or clearly reachable from, every page on the website.	Additional		Designers				
P6d	The initial search is easy	Basic		Designers Developers				
P6e	The initial search covers all content on the website	Additional		Developers				
P6f	The user can refine his/her search through an extended search function	Additional		Developers				
P6g	The user can customize how search results are presented	Additional		Designers Developers				
Site map								
P7a	A site map exists if the structure is extensive	Additional	2.4.5 (2)	Designers				
P7b	The site map reflects the entire menu structure In practice, it is rarely practical to include more than three sublevels. However, this is something that must be discussed on a case-by-case basis.	Additional		Developers				
'A to Z' functionality								
P8a	'A to Z' contains concepts which are addressed to the user and make it obvious what information exists on each linked page	Additional	2.4.5 (2)	Developers Authors				
P8b	'A to Z' is used to direct the user to the correct section of the website	Additional		Authors				
Form design								
P9a	Forms are designed in a clear way	Basic	3.3.2 (1)	Designers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	<p>This includes, among other things, that:</p> <ul style="list-style-type: none"> Form objects must be distinguishable and identifiable. Do not deviate unnecessarily from the browser's default look. Obligatory input fields must be clearly marked; both visually and in the input field description. Labels and their corresponding form objects must have an obvious visual association If different parts of the form are logically linked, they must be grouped on the page Forms should (as far as it is possible) be able to handle or correct improperly formatted data, such as dates. The size of input fields must be appropriate for the content The user should as far as it is possible be able to go back and undo previous actions. The number of fields and inputs are kept to a minimum. Functions to automatically fill in information (such as auto-completing addresses after the user gives his/her personal identity number) should be used when appropriate. 			Developers				
P9b	Forms are consistent throughout the website Different forms should use the same terminology for fields that do the same thing.	Additional		Designers Developers				
P9c	Forms have functionality to make it easier for the user to fill in information	Additional		Designers Developers				
P9d	Important forms give the user opportunity to review and confirm the information that is to be sent before it is sent Button design	Critical	3.3.4 (2)	Designers Developers				
P10a	Buttons are clearly distinguishable and appear clickable	Basic		Designers				
P10b	It is obvious what each button does	Basic	4.1.2 (1)	Designers Developers				
P10c	The placement of buttons is consistent throughout the website	Basic	3.2.3 (2)	Designers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
Error handling								
P11a	When an error occurs, it is clearly communicated to the user Errors must be clearly described in a joint error message area above the form, as well as right next to the field where they occurred. The error notification should not require the user to be able to distinguish colors. Do not, for instance, just mark fields containing errors with the color red. A designated error page should be shown whenever a page that was requested by the user cannot be found.	Critical	<u>1.3.3</u> (1) <u>3.3.1</u> (1))	Designers Developers				
P11b	It is made obvious where an error can be found and how it can be fixed	Additional		Designers Developers				
P11c	If an error occurs in a form, the correct information that has already been filled in must remain intact	Additional		Developers				
The design and description of links								
P12a	Links are designed in a clear way	Basic		Designers				
P12b	It is obvious where a link leads Primarily, this means that there needs to be a link text + an alt-text, if an image is part of the link. If that is not enough, the title attribute should be used to describe the link's target and its function. However, the latter should be viewed as a departure from good accessibility practice.	Basic	<u>2.4.4</u> (1) <u>2.4.9</u> (3)	Developers Authors				
P12c	Links that open new browser windows are clearly distinguishable	Basic		Developers Authors				
P12d	Links that lead to external websites are clearly distinguishable	Basic		Developers Authors				
P12e	Links that lead to documents are clearly distinguishable For instance, it must be obvious that a link leads to a PDF document. It should also be made explicit in the link text if the file size of the document is large.	Basic		Developers Authors				
P12f	Links that lead to other formats are clearly distinguishable	Additional		Developers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
	This applies to links leading to, for example, simpler language, sign language and film content. Complex formats			Authors				
P13a	Complex formats (such as PDF) are only used when appropriate to do so, and when they add to the user benefits Links to associated content	Additional		Designers Authors				
P14a	It is obvious to users where they can find alternatives to information that is presented in a form other than text Colors and contrasts	Basic	<u>1.1.1</u> (1)	Designers Authors				
P15a	Understandability does not depend on the user's ability to distinguish different colors No link or piece of information must rely on the user's ability to see colors. Therefore, links must be underlined or supplemented with an icon.	Basic	<u>1.4.1</u> (1)	Designers				
P15b	Foreground and background colors have high enough contrast against each other Use the WCAG contrast scale, where 4.5:1 is the lower limit for passing, and 21:1 is the maximum (black on white). You can use the tool Color Contrast Analyser, found at www.paciellogroup.com/resources/contrast-analyser.html	Basic	<u>1.4.3</u> (2)	Designers				
P15c	Text should not be displayed against a background that varies in color or hue Typography	Additional		Designers				
P16a	Headings are clearly distinguishable and readable	Basic		Designers				
P16b	Preambles are clearly distinguishable and readable	Additional		Designers				
P16c	Body text is clearly distinguishable and readable Limit line lengths to 70 characters or less, including empty spaces.	Basic	<u>1.4.8</u> (3)	Designers				
P16d	Image captions are clearly distinguishable and readable	Additional		Designers				

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
P16e	Quotes are clearly distinguishable and readable	Additional		Designers Authors				
Tables								
P17a	Tables are designed in such a way that they aid the understanding of the data that is presented	Basic		Designers Developers Authors				
About the website								
P18a	There is a section called "About the website"	Additional		Designers				
P18b	"About the website" contains information describing how the website works	Additional		Authors				
P18c	"About the website" contains information describing the kind of support that the website can offer to users with special needs.	Additional		Authors				
P18d	"About the website" offers information about ways that the user can customize the website's appearance by changing settings in the browser or operating system	Additional		Authors				
Help and transition to manual service								
P19a	Complex functionalities and services have a help function in some form There must also be clear user instructions directly within each such function/service.	Basic	3.3.5 (3)	Developers Designers				
P19b	If there are alternative ways to achieve the same result as that of a complex function, there is clear information describing to the user how that is done.	Additional	3.3.5 (3)	Designers Developers Authors				
P19c	If special knowledge is required to use the interface with an assistive aid of any sort, clear information about this is provided to the users in question	Additional	3.3.5 (3)	Developers Authors				
P19d	It is easy to identify contact information in the form of telephone numbers and e-mail addresses	Basic		Designers Authors				
Listen functionality								

No	Description	Notation	Reference to WCAG 2.0	Affected parties	Fulfilled	Partially	Not fulfilled	Not applicable
P20a	The website offers a way for the user to listen to text content	Additional	3.1.5 (3)	Designers				
P20b	The user may customize how the texts are read out It should be possible to change the reading speed and the way that the text is highlighted as it is read out.	Additional		Developers				
P20c	Each word is highlighted as it is read out Sign language	Additional		Developers				
P21a	The website offers important information in sign language. Understandable information in different formats (images, film, simple language, spoken information)	Additional	3.1.5 (3)	Authors				
P22a	The website has material adapted specifically for users that have difficulties reading texts If a user with a reading ability that is considered normal for a 15-year old has difficulties understanding the text, it needs to be simplified or complemented with film, illustrations and/or examples. Other languages	Additional	3.1.5 (3)	Designers Authors				
P23a	Language choices are managed in a thoughtful and consistent manner throughout the website	Additional		Designers				

END OF D1.1