



Deliverable D2.10

Customized platform
for Spanish Demo Case
(Second Version)



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Abstract of Deliverable	<p>Ground Truth 2.0 (GT2.0) aims to demonstrate that sustainable Citizen Observatories (COs) are possible. This is done using the innovative approach of combining the social dimensions of citizen observatories with enabling technologies, so that the implementation of the respective citizen observatories in six Demo Cases is tailored to their envisaged societal and economic benefits.</p> <p>The Spanish Demo Case (SDC) aims for the creation of a Citizen Observatory that is constituted in a way that is sustainable over time, where phenological observations provided by the citizens in real time are collected, to form an information base that will allow influence public policy decisions in Catalonia, Spain. Its stakeholders named their own Citizen Observatory “RitmeNatura.cat”.</p> <p>This report presents the enhanced version of the platform for the SDC Citizen Observatory that was developed jointly with end users during co-design sessions. The document is an update of the D2.4 – Customized platform for SDC (first version).</p>

Versions and Contribution History

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V2.0	15.06.2018	Camille Pelloquin	Update regarding the “enhanced” platform developed
V2.1	20.06.2018	Cristina Muñoz	Document review
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List of abbreviations

CMS	Content Management System
CO	Citizen Observatory
GBIF	Global Biodiversity Information Facility
OGC	Open Geospatial Consortium
SDC	Spanish Demonstration Case, Spanish Demo Case
SOS	Sensor Observation Service
SRNCO	"Segueix el Ritme de la Natura" Citizen Observatory, the Citizen Observatory of Catalonia, Spain
URTT	User Requirement Tracking Tool

Executive Summary

Ground Truth 2.0 (GT2.0) aims to demonstrate that sustainable Citizen Observatories (CO) are possible. This is done using an innovative approach combining the social dimensions of citizen observers with enabling technologies so that the implementation of the respective citizen observatories is adapted to the social and economic benefits anticipated.

The Spanish Demo Case (SDC) aims for the creation of a Citizen Observatory that is constituted in a way that is sustainable over time, where phenological observations provided by the citizens in real time are collected, to form an information base that will allow influencing in public policy decisions in Catalonia, Spain. Its stakeholders named their own Citizen Observatory “RitmeNatura.cat”. This document describes how, starting from the functional design of the SDC, going through the technical design and integration of IT components, the SDC platform was developed and services enhanced and integrated in the demonstration case platform. The document is an update of the D2.4 – Customized platform for SDC (first version).

1. Introduction

1.1 Background.

The Ground Truth 2.0 project will deliver the demonstration and validation of six scaled-up citizen observatories in real, operational conditions, with four European and two African demonstration cases. It will demonstrate the technological feasibility, the sustained use and the societal and economic benefits of such citizen observatories. The ultimate objective is the global market uptake of the concept and enabling technologies.

One of the main objectives of WP2¹ is to enable adequate customization, deployment and upscaling of the required technical solutions in each demonstration case. Considering the different starting points and the differences in the cases' requirements, the aim is to set up a technological architecture in each case, taking into account both common modules as well as peculiar ones.

Within this frame, the Task T2.1, Technical design and integration of components per demonstration case, will settle the specific requirements of each demonstration case, based on the user's requirements made during the work carried out as Task T1.3, Functional design. The Task T2.1 is being developed with the purposes of: making the technical design for each demonstration case; developing standard integration between demonstration cases; and configuring the technological platform in each demonstration case.

The Task T2.6 Data visualisation and enhanced services aims to further develop the Demo cases platforms with additional features to support the next phases of the implementation of the Observatories, including services such as visualisation modules and integration in the GEOSS data provision services.

The Task T2.6 with its D2.10 document output, provided the scope of the extended technical developments of the Spanish demonstration case, providing a second version of the platform.

1.2 Purpose of the document.

This document corresponds to the output of the Task T2.6 where an enhanced platform is being developed. It keeps the content from D2.4 as a basis for the improvement and implementation of additional services. It describes the additional features added to the first version of the platform to provide an enhanced platform.

1.3 Structure of the document.

Section 2 describes the results of the planning carried out by the community of stakeholders that participate in the SDC. They, through co-design work sessions, defined and validated the Vision, Mission and Objectives of RitmeNatura and the customized Functional Design for the SDC, following the guidelines proposed by WP1.

Section 3 presents the platform architecture validated by the CO community of the SDC, designed to satisfy the user requirements of the customized Functional Design, the selection of technological tools and the mock-up developed to obtain feedback from the community.

Finally, Section 4 presents and describes the website of the enhanced version of RitmeNatura platform, created based on the customized Functional Design and the feedback from the community of the SDC.

¹ Ground Truth 2.0 - Environmental knowledge discovery of human sensed data, DoA extract FINAL for kick-off, 1.3.3. WT3 Work package descriptions

2. Summary of Functional Design for the platforms of the Spanish Demo Case

During the co-design sessions with local stakeholders, different activities were carried out to identify the challenge of the Spanish Demo Case Citizen Observatory and to define the Mission, Vision and Objectives. Then, the functional design for accomplishing these premises was developed.

2.1 Mission, Vision and Objectives of Segueix el Ritme de la Natura Citizen Observatory.

The representatives of the Catalan stakeholders who are part of the co-design group validated, in the third co-design session, the Mission, Vision, and Objectives of RitmeNatura, as presented below²:

Vision: "RitmeNatura" will be, in the digital world, a place that allows citizens, managers and politicians to access and share phenological information. Such place will allow communication among stakeholders and will be sustainable in time.

Mission: The "RitmeNatura" Observatory will be the place where phenological data, in particular that collected by citizens, will be stored and made accessible in real time, with the aim of influencing decision making.

Objectives:

- 1) To create an open citizen science platform dedicated to store, comment, share and disseminate facts, opinions and proposals about the effects of climate change on nature to influence decision-making related processes.
 - (a) To disseminate proposals related to the effects of climate change on nature and promote a space to discuss them
 - (b) To share opinions with other users regarding the effects of climate change on nature
- 2) To generate useful information for understanding the impact of climate change on nature, through data collection by citizens, following guided observation protocols,
 - (a) That allows sharing and validation of the observations collected.
 - (b) That allows access to relevant information (data, studies, etc.)
 - (c) That motivates and promotes relevant educational activities.
- 3) To establish synergies with existing platforms and to ensure that the Observatory becomes a single and full reservoir of Spanish information and linked organizations related to the effect of climate change on nature to share self-generated content as well as the observers' contributions.
- 4) To promote the sustainability of the Observatory beyond the end of the project.

2.2 Functional Design

In GT2.0, functional design is defined as a method to translate the stakeholders' requirements into design features (see D1.5). A generic "Story Map"³ was proposed to guide the development of a customized story

² GT2.0-Deliverable 1.5 Functional Design of the citizen observatories, v2.0, 4.4.1 Challenge, mission, vision and objectives Spain, page 44.

³ The generic Story Map is fully described in Ground Truth 2.0 "Deliverable D1.5, Functional design of the citizen observatories".

map for each DC. It was also proposed that the user requirements are stored in a “User Requirement Tracking Tool” (URTT)⁴ to allow for easy tracking of their status and to identify the corresponding layer in the platform architecture.

Departing from the generic Story Map as reference point, the co-design group of the SDC, working in co-design sessions, developed their own Story Map⁵ and URTT from the perspective of the future users of the RitmeNatura, citizens, scientists and policy makers. The customized and validated entries in the URTT⁶ form the basis for the deployment of the platform architecture of RitmeNatura.

The functional design for the SDC platform focuses on the local impacts of climate change on nature. The enhanced version of RitmeNatura platform is supported by existing technologies such as Natusfera and WordPress platforms, to build an active community to collect and validate phenological data and disseminate these data to influence climate-related decisions in Catalonia.

The RitmeNatura builds on existing communities, integrated by highly-committed citizen scientists observing selected phenological variables along the year to record its states:

- 1) The Fenocat community, coordinated by Meteocat, the Meteorological Agency of Catalonia.
- 2) The FenoDato community, coordinated by CREA, collecting phenological data, focusing on a certain number of representative species, now redirecting their activities to RitmeNatura

The RitmeNatura platform is conceived as a central community portal, to give access to the different components of the technology supporting the observatory.

2.2.1 Tools for the development of the platform

WordPress

WordPress⁷ is a CMS (Content Management System) focused on the creation of any type of webpage. Originally it reached a great level of popularity in the creation of blogs, to become over time one of the main tools for the creation of commercial web pages. It is developed in PHP for environments running MySQL and Apache, under the GPL license and it is open source.

To operate, WordPress has been installed on an Azure cloud web (which is described below).

For RitmeNatura, the following plugins have been set on WordPress that provide functionality to the user stories.

- All in One WP Security: It is used for the security of the web page. Different configuration options can be controlled, such as include captcha in different registration sites, change the access path to the backend of the web, set options to avoid search engines.
- Elementor: It is a plugin used for web pages layout, using different Drag and Drop components and customizing the configuration, avoiding modifying the CSS styles manually.
- MailMunch: It is a free plugin, which allows users to subscribe and store information in a list that can be exported to a CSV format.

⁴ The User Requirement Tracking Tool is described in Ground Truth 2.0 “Deliverable D1.6, Management and tracking tool of user requirements”.

⁵ GT2.0-Deliverable 1.5 Functional Design of the citizen observatories, v2.0, 4.4.2 CO Story Outline Spain, pages 44-45.

⁶ GT2.0 WP1. Spain URTT.

⁷ <https://wordpress.org/>

- Jetpack: It is a plugin that allows to make backups, social sharing, to have the WordPress features. Currently, it is being used to show the Twitter account on the main page.

Natusfera

In the SDC, for the Data collection and data aggregation the **Natusfera** technological tool is used.

Natusfera is a platform for creating citizens science projects mainly used to record biodiversity observations. It is a branch of the e-Naturalist platform.

The citizens with a user profile can provide tagged observations that might be accompanied by pictures. The system can add attributes on the species tagging that can be ideal to focus on a particular aspect like phenology.

Twitter

Twitter is an online news and social networking service which users post and interact with messages known as “tweets”. For the citizen observatory, we created our own twitter account @RitmeNatura and are using the platform to disseminate any relevant information about the CO, such as events, outputs, improvements in addition to phenology related news and resources.

2.2.2 Monitoring and assurance of the technical performance of the platform

Azure

Microsoft Azure is an open source and flexible cloud platform that allows compiling, implementing and managing applications quickly, in a global network of data centres managed by Microsoft.

The standard plan has been designed to implement production workloads. The integrated network load balancing functionality automatically distributes traffic between the versions. This plan also includes automatic scaling that can automatically adjust the number of versions of the virtual machine that are running to meet traffic needs. The standard service plan with Linux runtime environments support Web App for Containers.

The monitoring and assurance of the performance of the platform is made using the tools that Azure provides (Figure 1). These tools allow you to monitor, for example, the CPU, Free Space, and Disk Space.

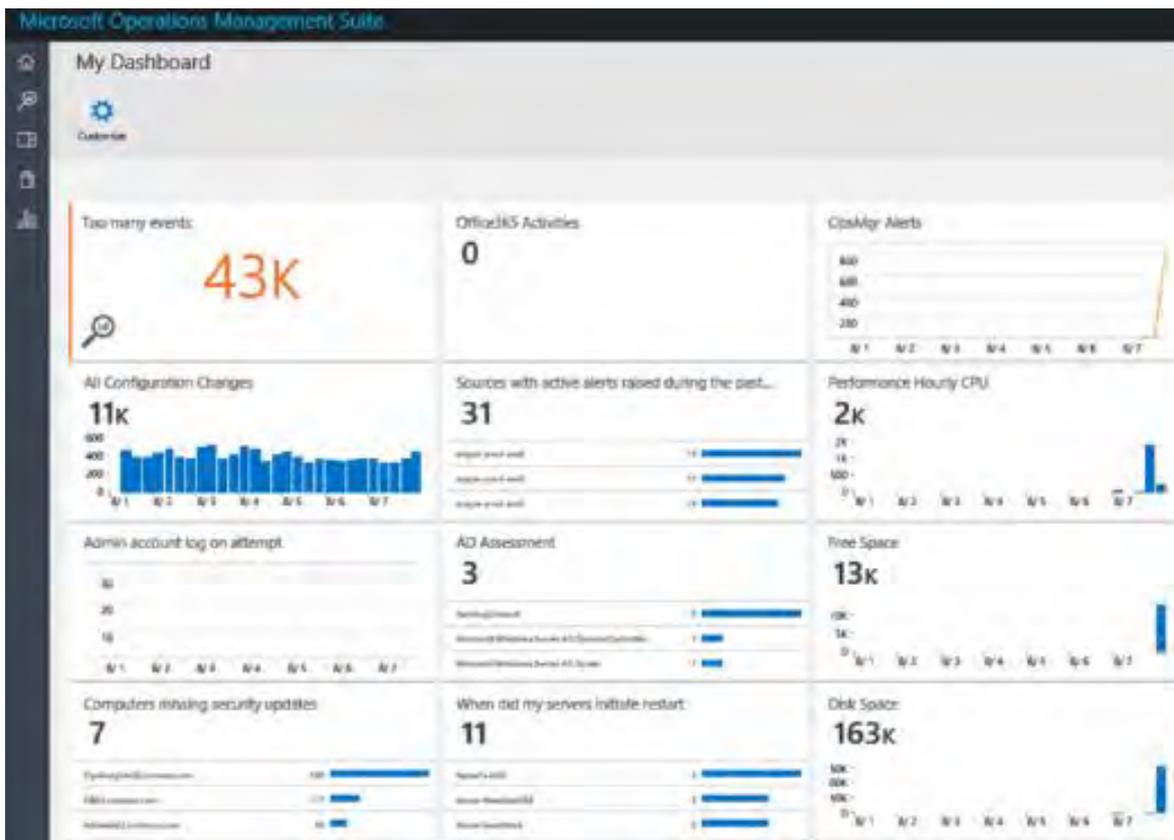


Figure 1 Monitoring of the infrastructure

2.2.3 Standardization of data management

From the “Task 2.3 – Standard access for data repository”, common approach has been defined as guidelines to provide a standard access to the collected data and easily provide this to the GEOSS community. The chosen OGC SOS standard allow managing observation following OGC standards. Existing implementation of the standard are available such as the ISTSOS which is Python implementation of the standard.

Sensor Observation Service (SOS) standard

The SOS standard is applicable to use cases in which sensor data needs to be managed in an interoperable way. This standard defines a Web service interface which allows querying observations, sensor metadata, as well as representations of observed features. Further, this standard defines means to register new sensors and to remove existing ones.

In the case of RitmeNatura, observation can be seen as single date measurement of a sensor.



Figure 3 Event organization module



Figure 4 Event description

Online discussions

A dedicated space for online discussions has been implemented in RitmeNatura.cat. The forum section aims at covering multiple aspects of the functional design among with interaction between community members around various topics of interests. Easy to use WordPress plugin has been implemented allowing community members to interact easily with the available administration tools.

Online discussions may include discussing scientific results, debating potential policy influence or support users in observing phenological phases of any relevant specimens. Topics would be added by the community along the development of the community.

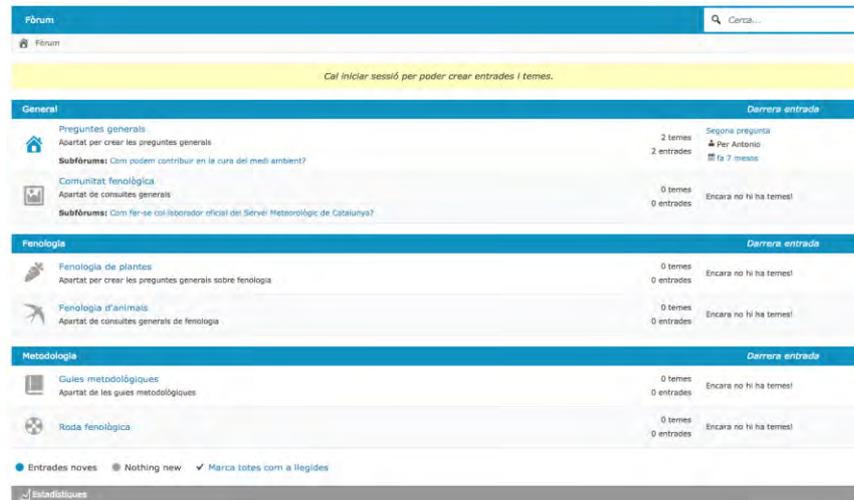


Figure 5 Forum, online discussions

Visualization tool

The visualization tool provides a view of all the collected phenology data or connected to the observatory such as Natusfera, Fenocat. As previously described, the data is centralized into an SOS system including a central database of phenology data.

A similar approach to Natusfera has been implemented into the RitmeNatura.cat platform. The map presents the geolocated data into a map with its corresponding phenological state.

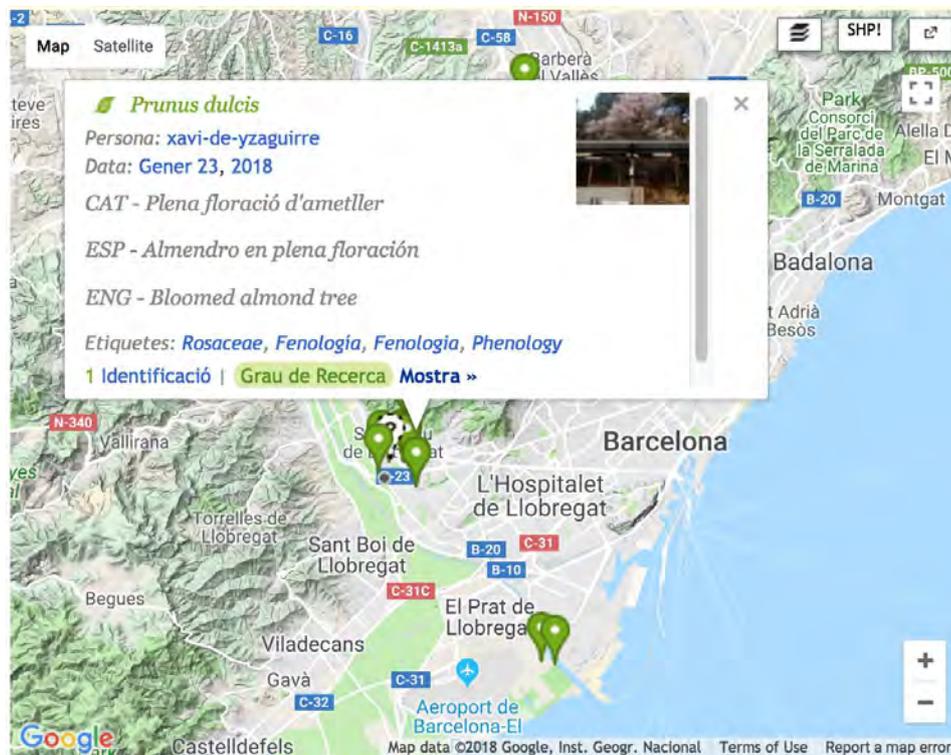


Figure 6 Visualisation map

Recent agreement obtained with the Meteocat is providing the opportunity to understand in depth the outputs generated and its potential post-analysis display to provide clear Key Indicators to the impact on nature of climate change from phenology data. For that reason, the visualization tool is still under development.

The module will allow statistical analysis of the information collected. As such, the community members will be using the visualization tool to generate relevant Key indicators. Possibilities of filtering will provide flexibility in selecting the region, the species, and the period of analysis. Key Indicators will then be generated from the selection of observation on the map. In addition, the information generated will be easily exportable to provide content for reporting.

3. Platform technical design and integration of components of the RitmeNatura Citizen Observatory

3.1 Platform architecture and selection of technological tools to use.

The definition of the architecture of the CO platform was made taking into account the SDC URTT⁸ and the proposals of D2.1⁹. The co-design group validated this in the third and fourth co-design sessions. Figure 7 is a schematic view of the architecture of this platform.

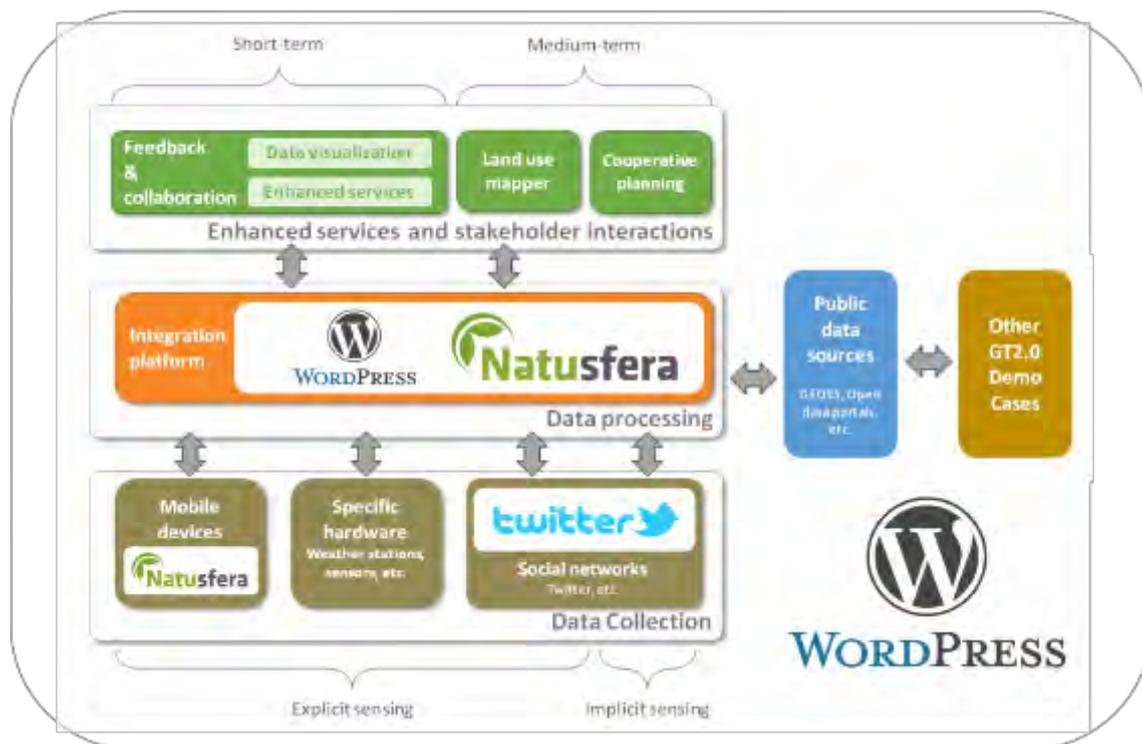


Figure 7 Architecture of the RitmeNatura platform

⁸ GT2.0-Deliverble 1.5 Functional Design of the citizen observatories, v2.0, 4.4.4 User-generated Story Map, Spain Demo Case, pages 47 - 48.

⁹ Ground Truth 2.0 Deliverable D2.1, Technical Design and Integration of Components.

Two tools were selected for the implementation of the RitmeNatura platform: Natusfera and WordPress.

- Natusfera is a digital platform, open and easy to use, that requires no technical knowledge from those that want to record and share observations of nature, meet other naturists and learn about the natural world. People can register, download the app and start creating their own projects or virtual field notebooks. All users can help each other to identify species and to develop multiple projects. Natusfera offers many features to collect and validate local observations on desktop and mobile devices. It provides tools to build the community and allows information exchanges and knowledge, such as fora. It has tools to organize activities and meetings and to help regroup community members throughout the territory. The Natusfera platform has also tools to debate local outputs of the observatory and its use for influencing decision makers.
- WordPress is a free and open-source CMS based on PHP and MySQL for create websites, blogs or applications.

The public data gathered by Natusfera is supported by gbif.es. GBIF—the Global Biodiversity Information Facility—is an open-data research infrastructure funded by the world’s governments and aimed at providing anyone, anywhere access to data about all types of life on Earth.

The implementation of the specific architecture defined for the platform is completed, with elements of Data Collection among which the use of mobile phones services through the Natusfera application that makes it possible to make real time observations, upload data and participate and disseminate in social networks such Twitter.

The interaction between the 3 sections of the specific architecture is dynamic and foresees a continuous updating of RitmeNatura functionalities supported by the selected technological tools that allow the navigation flow in the Observatory.

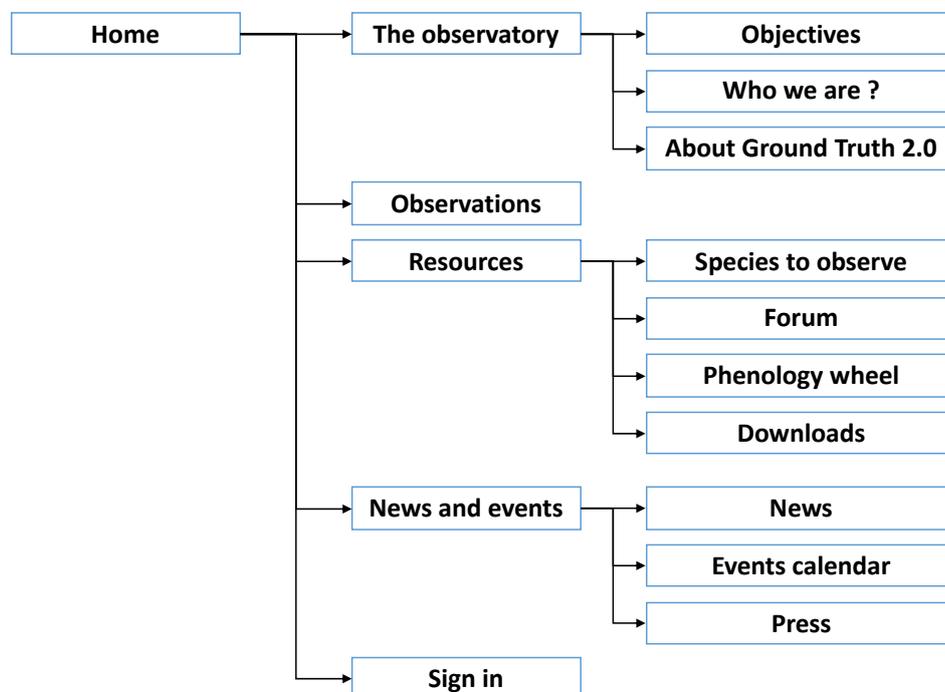


Figure 8 Navigation flow of the website of RitmeNatura platform

The navigation flow (Figure 8) was developed in compliance with the D2.1 Technical Design for the development of the RitmeNatura platform in which an entry flow is proposed to the RitmeNatura from the citizens' different profiles in which these users are guided in order to discover the Observatory and its functionalities.

- Point of contact of the citizens with the RitmeNatura Home from different perspectives of access and usage preferences, according to the user's preference towards the community; data recognition; education; publications and events; subscription; space reserved to an observation map; contributions: through Natusfera technological tool; how are we; Twitter and news that will be developed according to the specific architecture essentially implemented from WordPress.
- The navigation point in RitmeNatura through the access to Community and later access to the introduction and presentation of the space that present the institutions that compose the "we" section.
- The navigation point in the RitmeNatura through publications and events that later allows to link and provide access to the calendar of phenological and Observatory's events.

Thus, the navigation in the RitmeNatura is carried out according to the priorities defined by the co-design group, supported by the specific architecture of the platform and respecting the different perspectives of navigation and satisfying the navigation needs and platform connection.

3.2 Mock-up and feedback

During the fourth co-design session, the co-design group had the opportunity to examine the content of different platform prototypes. They tested the different pages that contain the user requirements. In this session, the co-design group defined the prioritized user stories tracked in the SDC URTT for the first version of RitmeNatura. The user stories with priority 2 will be postponed for the final version of the platform.

The main feedbacks received during the prototypes evaluation period are summarized as follows.

- 1) The CO co-design group validated the contents and navigation flow of the website of RitmeNatura platform (first version). Figure 8 is a schematic presentation of the navigation flow of the validated prototype.
- 2) The validated prototype showed the concept of RitmeNatura platform as central co-design group portal for FenoDato and Fenocat. The mock-up showed also how the platform redirects to and receives outcomes from Natusfera.
- 3) A name for the CO was discussed and finally the name "RitmeNatura" was coined and registered as the internet domain ritmenatura.cat
- 4) The co-design group agreed on a list of tasks needed to complete the first version of the RitmeNatura platform. Table 1 shows these tasks and the responsible organization.

The activities related to the development of the RitmeNatura platform are detailed in the previous section (Table 1, Table 2).

Table 1 First version of RitmeNatura from the mock-up

Task	Tools	Responsible
Register the internet domain ritmenatura.cat	MS Azure DNS	CREAF
Cloud Server Configuration	MS Azure	ALTRAN
Link-up of WordPress and Natusfera	WordPress Natusfera	STARLAB
Transfer mock-up contents to ritmenatura.cat	WordPress	ALTRAN
Generate the project "Segueix el ritme de la natura" within http://natusfera.gbif.es/ , with a section for occasional observations and another section for structured observations.	Natusfera	STARLAB
Design of RitmeNatura logo. Design of web style page for ritmenatura.cat. Validation of both designs with stakeholders.	WordPress	ALTRAN STARLAB CREAF
Coordination, redaction and revision of content (texts and figures) of ritmenatura.cat website pages. Validation of contents with stakeholders.	WordPress	STARLAB ALTRAN CREAF

Table 2 Second version of RitmeNatura from the first version

Task	Tools	Responsible
Update pages and overall structure of the webpage from the 5 th co design session comments	WordPress	ALTRAN
Integration of multiple WordPress plugins (forum, calendar, ...)	WordPress	ALTRAN
Structure Forum discussion	WordPress	ALTRAN
Developing, integrating further content (species, material...)	WordPress	CREAF STARLAB
Developing the signing up module and its integration	Customized WordPress	STARLAB
Standardization, connection to SOS, and to GEOSS	SOS, WordPress	CREAF STARLAB
Developing visualisation module for observation display	Customized WordPress	STARLAB

4. Presentation and description of contents of RitmeNatura Citizen Observatory platform

The following sections present the design work carried out in the 3rd and 4th sessions by the co-design group and its application to the Technical Design of the RitmeNatura platform. It allowed the selection of technological tools to support the demo case activities according to the specific architecture of the platform.

The first version of RitmeNatura platform was officially launched on the www on November 2017 at the domain <http://ritmenatura.cat/> and its second version in April 2018.

The pages of the website are written in Catalan, one of the 2 official languages of Catalonia, which is the geographical area where the Spanish demo case is implanted.

Subsequently, a monitoring of the proposed tools exercise allowed the connection of the Headlines and Sub-headlines selected by the co-design group with the technological tools to be implemented in the first version of platform and for compliance with the identified functionalities. This is included in Table 2. Development of Technological platform. Technical Design and integration of components.

The second version of the platform is a consequence of both addition of features and services to the platform and adjustment from the co-design group during the 5th co-design session. The 5th co-design session allow presentation and testing of the final first version available online. That session also provided evidence of the usefulness of the platform and provided visual support for the co-design group activities which included additional features and content for the platform. Therefore, the second version is a combination of new features, improvements and additional content.

In the upper left corner of the homepage, we can see the RitmeNatura logo (Figure 9):



Figure 9 RitmeNatura logo

This logo has the same colours as the “Ground Truth 2.0” logo and the same symbol.

The home page of RitmeNatura presents clearly defined sections which contain information, data and the interaction sought by the RitmeNatura to attract the citizen participation.

Following from left to right, we could see the “menu” of functionalities (Figure 10) that are available in the first version of the platform:



Figure 10 Menu of available functionalities

The two version of the platform implements the Headlines and Sub-headlines prioritized for the RitmeNatura. Supported by the specific architecture proposed and developed with the WordPress technological tool, they enable the functionalities identified in the 3rd and 4th sessions by co-design group and improved

during the 5th session. The home page and the menu section configure the starting point, from different user perspectives, for navigation on the RitmeNatura platform.

Observations: It proposes the engagement of the citizens with the RitmeNatura and to make observations. The Natusfera technological tool has been configured specifically with the SDC projects and it allows making nature observations in Catalonia.

The integration of Natusfera allowed to configure the projects of the SDC in a specific way. In a general project the RitmeNatura is presented (<http://natusfera.gbif.es/projects/ritmenatura-cat-segueix-el-ritme-de-la-natura>); a specific subproject to carry out occasional observations (<http://natusfera.gbif.es/projects/ritmenatura-cat-observacions-ocasionals>) and a specific subproject to make recurrent observations (<http://natusfera.gbif.es/projects/ritmenatura-cat-observacions-recurrents>) that allow the citizens to make contributions and provided access to open monitoring data of nature in Catalonia.

The view presents a large picture of the citizen observatory, followed by a map. There is a link to a form where citizens can share their observations.



Figure 11 Natusfera Project SDC “RitmeNatura.cat - Segueix el ritme de la Natura”

Objectives: The citizens of the platform access this section to know the purpose of the RitmeNatura and the concept of phenology adopted by the SDC co-design group.

The sections “observations” and “objectives” are shown in Figure 12 below.



Figure 12 Head of the homepage of RitmeNatura website

What do we do? This section is prepared to host an explanatory video that will allow one to discover the value of their contributions.



Figure 13 Middle section of the homepage of RitmeNatura

The lower middle section of the homepage includes news presenting a twitter feed (@RitmeNatura) and upcoming activities and other communications.

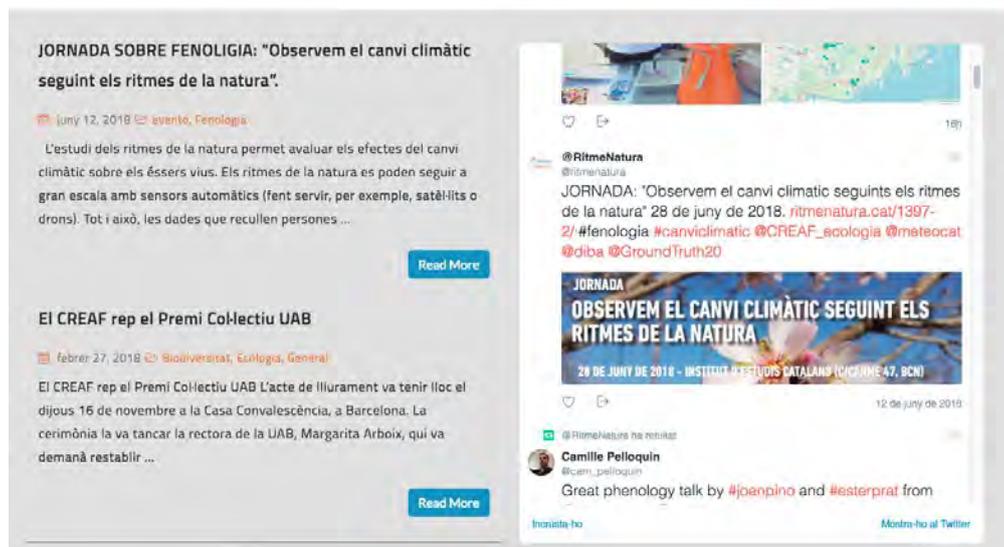


Figure 14 Lower middle section of the homepage of RitmeNatura website site

Sign in: This is a subscription space to the RitmeNatura. In the first version of the platform, citizens were asked to provide their name and email address to contact them shortly, whereas in the second version the section allow signing up as part of the community.

Introduction: It is a space for the presentation of the Vision, Mission and Objectives of the RitmeNatura, validated by the co-design group. Brief introduction to GT2.0 project.

The observatory: Presentation of the institutions of the co-design group with members of institutions dedicated to phenology, climate change, public policy managers and citizens. It also presents a point of navigation to the web pages of the institutions that make up the SDC.

Observations: That section link to the Natusfera platform where observation are done. It allows participants to collect phenological information.

Resources: This space is dedicated to the knowledge and educational material of the platform. The most relevant species to be observed as key indicator for phenology are described and their respective phenological state placed on a timeline along the year. The knowledge discussion forum is also providing space to discuss interesting topics. Some downloadable material to run workshops is also available for offline activities.

Publications and events/Calendar: Space for the dissemination of activities related to the phenology and the events of the RitmeNatura. It also includes news feeds and press releases which are also presented in the main front page.

Map: Visual representation of the observation over a map, with possibilities to filter by species, phenological state as examples.

Footer: Overview of demo case partners and existing collaborations.



Figure 15 Bottom section of the homepage of RitmeNatura website

A link from the RitmeNatura to @RitmeNatura Twitter [https://twitter.com/ritmenatura] was specifically set up for the SDC dissemination Figure 16.



Figure 16 Head of RitmeNatura Twitter page

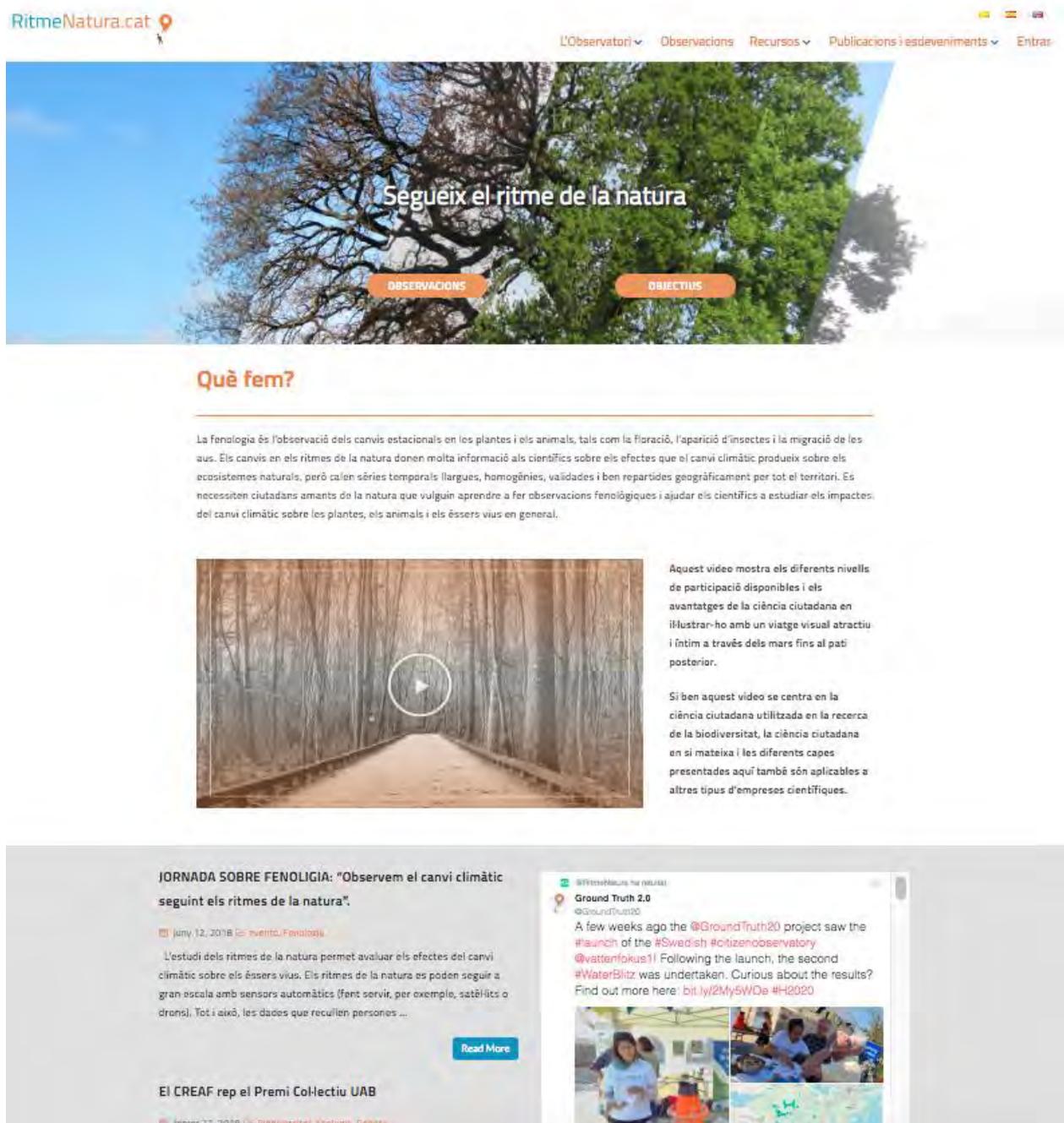


Figure 17 Integral view of the homepage of RitmeNatura website

Table 3 Development of Technical Platform. Technical Design and integration of components.

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT ?	TOOL	WHERE?
DISCOVER THE OBSERVATORY	Read portal/info pages	Yes (first version)	NA	WordPress (plugin)	http://ritmenatura.cat
	Watch videos	Yes (first version)	NA	YouTube	http://ritmenatura.cat
	Play games/do quizzes	no	-	NA	NA
	Access public data/materials	Yes (first version)	NA	WordPress (Api Natusfera)	http://ritmenatura.cat/contribuir/
	Take guided tours	no	-	NA	NA
JOIN THE COMMUNITY	Register account/agree terms	Yes (second version)	NA	WordPress (customized plugin)	http://ritmenatura.cat/login/
	Provide information required for user assessment/verification	Yes (second version)	NA	WordPress (customized plugin)	http://ritmenatura.cat/login/
	Create profile & link to other users (Natusfera)	Yes (second version)	NA	WordPress (customized plugin)	http://ritmenatura.cat/login/
	Choose notifications channels	no	-	NA	NA

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT ?	TOOL	WHERE?
SUBMIT AND PROCESS DATA	Submit open observations for exploration and discovery	Yes (first version)	NA	WordPress (Api Natusfera)	http://ritmenatura.cat/contribuir/ http://natusfera.gbif.es/projects/ritmenatura-cat-segueix-el-ritme-de-la-natura
	Send notifications to “go and observe”	no	-	NA	NA
	Submit observations according to research protocols and instructions	Yes (first and second version)	NA	WordPress (plugin)	http://ritmenatura.cat/roda-fenologica/ http://ritmenatura.cat/especies/
	Add tags and meta-data	Yes (second version)	NA	Natusfera	https://natusfera.gbif.es/
	Provide comments on observations	Yes (second version)	NA	Wordpress (forums) and Natusfera (observations)	https://natusfera.gbif.es/
	Integrate external data sets	no (third version)	NA	WordPress and Sensor Observation System (SOS)	NA

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT?	TOOL	WHERE?
SUBMIT AND PROCESS DATA	Validate/process scientifically	Yes (first version)	NA	Natusfera	https://natusfera.gbif.es/
EVALUATE RESEARCH ACTIVITIES OR POLICY/ STEWARDSHIP RESULTS	Rate and review activities	no	-	NA	NA
	Launch or respond to surveys	no	-	NA	NA
	Post or review results data	Yes (second version)	NA	WordPress (forum)	http://ritmenatura.cat/forum/
	Discuss results	Yes (second version)	NA	WordPress (forum)	http://ritmenatura.cat/forum/
TRAIN AND LEARN	View instruction videos	no	-	NA	NA
	Access/download manuals and field guides	Yes (first and second version)	NA	WordPress (plugin)	http://ritmenatura.cat/roda-fenologica/ http://ritmenatura.cat/especies/
	Test knowledge	no	-	NA	NA
	Create and get feedback on test submissions	no	-	NA	NA

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT?	TOOL	WHERE?
TRAIN AND LEARN	Develop personal competencies	Yes (second version)	NA	WordPress (material)	http://ritmenatura.cat/descarregues/
USE KNOWLEDGE HUB TO UPLOAD OR ACCESS EXISTING DATA, INFORMATION AND SERVICES	Search/Browse observatory data	Yes (first and second version)	NA	WordPress (plugin)	http://ritmenatura.cat
	Browse observatory database	no	-	NA	NA
	View maps and visualizations	Yes (second version)	NA	WordPress (customized plugin)	http://ritmenatura.cat/maps
	Upload existing data and information	Yes (second version)	NA	WordPress (news, forums, downloads/uploads)	http://ritmenatura.cat/noticies/ http://ritmenatura.cat/descarregues/ http://ritmenatura.cat/forum/
	Use CO knowledge hub	Yes (first and second version)	NA	WordPress (plugin)	http://ritmenatura.cat
	Use enhanced services	Yes (second version)	NA	WordPress (customized plugin)	http://ritmenatura.cat
INFLUENCE BROADER POLICY AGENDA	Participating decision makers	no	-	NA	NA
REACH OUT AND RAISE AWARENESS	Share contents on social media	Yes (Not relevant)	NA	WordPress, Twitter	http://ritmenatura.cat https://twitter.com/ritmenatura

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT?	TOOL	WHERE?
REACH OUT AND RAISE AWARENESS	Create, send or read newsletters	no	-	NA	NA
	Download information/promotion materials	Yes (first version)	NA	Word-Press (plugin)	http://ritmenatura.cat/descarregues/
	Launch or take part in online campaigns	no	NA	NA	NA
	Find/join/promote offline activities	Yes (second version)	NA	Word-Press (plugin)	http://ritmenatura.cat/calendari-esdeveniments/
DISCUSS AND SET THE CO AGENDA FOR RESEARCH AND NATURAL RESOURCE MANAGEMENT	Post concerns/ideas in discussion fora	Yes (second version)	NA	Word-Press (plugin)	http://ritmenatura.cat/forum/
	Take part in (live) online discussions	no	NA	NA	NA
	Organize offline activities	Yes (Second version)	NA	Word-Press (plugin)	http://ritmenatura.cat/calendari-esdeveniments/
	Interpret exploratory data and set internal agenda	Yes (second version)	NA	Word-Press (plugin)	http://ritmenatura.cat/maps
	Develop a shared vision	Yes (first and second version)	NA	Word-Press (plugin)	http://ritmenatura.cat

PLATFORM IMPLEMENTATION					
HEADLINES	SUBHEADLINES	YES/NO	WHY NOT?	TOOL	WHERE?
SUPPORT IMPLEMENTATION OF PLANS AND POLICIES WITH MONITORING AND INFORMATION SHARING	Communicate new policies/plans	Yes (second version)	NA	WordPress (plugin)	http://ritmenatura.cat/noticies/
	Access info how to comply/participate	Yes (second version)	NA	WordPress (plugin)	http://ritmenatura.cat/noticies/
	Create, promote or find offline activities	Yes (second version)	NA	WordPress (plugin)	http://ritmenatura.cat/noticies/ http://ritmenatura.cat/calendari-esdeveniments/
	Track progress of activities	no	-	NA	NA
	Monitor status of a resource	no	-	NA	NA
	Encourage compliance and facilitate communication with formal authorities	no	-	NA	NA
PARTICIPATE IN POLICY CONSULTATIONS AND DESIGN PLANNING ACTIVITIES	Post policy drafts and request feedbacks	no	-	NA	NA
	Provide feedback on policy drafts	no	-	NA	NA
	Organize/Invite to off-line activities	Yes (second version)	-	WordPress	http://ritmenatura.cat/calendari-esdeveniments/

HEADLINES	SUBHEADLINES	YES/NO	WHY NOT?	TOOL	WHERE?
PARTICIPATE IN POLICY CONSULTATIONS AND DESIGN PLANNING ACTIVITIES	Report on results of the planning process	no	-	NA	NA
	Platform features to co-design mutually	no	-	NA	NA

Table 4 Summary of contents of each page of RitmeNatura website

Page ¹	Content ^{2, 3}	Spain Story Map ⁴ Headline - User card
<i>Pàgina d'inici</i> [Home page]	Links to all website pages and platform functionalities.	H1. Discover the observatory - 1.1. Read portal and info pages
<i>Objectius</i> [Objectives]	Description of the observatory and the topic: phenology	H1. Discover the observatory - 1.4. Access public data/materials
<i>Nosaltres</i> [We]	Brief description of the RitmeNatura participating organizations and link to the website of each one	H1. Discover the observatory - 1.4. Access public data/materials
<i>Sobre el Ground Truth2.0</i> [About the Ground Truth 2.0]	Brief introduction of GT 2.0 project and link to the project website. RitmeNatura Vision, Mission and Objectives.	H1. Discover the observatory - 1.4. Access public data/materials
<i>Observacions</i> [Observations]	Call citizen participation in the observatory project "Segueix el ritme de la natura" for occasional as well as recurrent observations. (http://natusfera.gbif.es/projects/ritmenatura-cat-observacions-ocasionals and http://natusfera.gbif.es/projects/ritmenatura-cat-observacions-recurrents)	H3. Submit and process data - 3.1. Submit open observations for exploration and discovery - 3.5. Submit observations according to research protocols and instructions
<i>Especies en observació</i> [species under observation]	Description of the most relevant species to observe	H3. Submit and process data - 3.1. Submit observations according to research protocols and instructions

Page ¹	Content ^{2,3}	Spain Story Map ⁴ Headline - User card
<i>Forum</i> [Forum]	Forums section, providing space to discuss any relevant topic, around communities, science, potentially policies.	H6. Discuss and set the agenda - 6.1 Post concerns/ideas in for a discussion
<i>Roda Fenològica</i> [Phenological wheel]	A request is made to people to participate in the observatory, making phenological observations and using "phenological wheels" as register tools, to follow the nature rhythm.	H3. Submit and process data - 3.1. Submit open observations for exploration and discovery
<i>Descàrregues</i> [Downloads]	Content management section to provide educational, and promotional material to the community	H5. Train and learn
<i>Calendari d'esdeveniments</i> [Calendar]	Ads of public events (meetings, work sessions, conferences and so on) related to nature and climate change, for the next months and year.	H11. Reach out and raise awareness - 11.9. Find/join/promote offline activities
<i>Notícies</i> [News]	Posting news about the observatory and the community	H11. Reach out and raise awareness
<i>Prensa</i> [Press releases]	Posting press release about the observatory activities	H11. Reach out and raise awareness
<i>Entrar</i> [Subscribe]	Registration as user of platform functionalities reserved for registered users.	H2. Join the CO community - 2.1. Register account and agree terms

Page ¹	Content ^{2,3}	Spain Story Map ⁴ Headline - User card
<i>Què fem?</i> [What we do?]	What are doing and what will do the community members. This area of the main page present a video explaining the value of citizen observers' registries.	H1. Discover the observatory - 1.4. Access public data/materials
<i>Ver mapa</i> [See map]	This page will give access to georeferenced data and information in the RitmeNatura database and in the library of the Natusfera web.	H4. Use CO to upload or access existing data, information and service - 4.3. View maps and visualizations
Twitter panel in homepage	This panel displays the last tweets received in the twitter account of RitmeNatura (@RitmeNatura, https://twitter.com/ritmenatura), in order to show the contributions and opinions of the community in real time.	H11. Reach out and raise awareness - 11.1. Share contents on social media

Notes to Table 3.

¹ The Catalan page name is written in italics; its English translation is written between square brackets.

² Abbreviations: GT2.0, Ground Truth 2.0 project

³ All the pages, with the exception of homepage, have Search function

⁴ See "GT2.0-Deliverable 1.5 Functional Design of the citizen observatories", v2.0, 4.4.4 User-generated Story Map, Spain Demo Case, pages 47-48