MOVING
MOuntain Valorisation through INterconnectedness and Green growth

MOVING Mountains App

A mobile application for the MOVING project

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Acronyms

Abbr.	Description
EU	European Union
H2020	Horizon 2020
OIDC	OpenID Connect
T	Task
VRE	Virtual Research Environment
WP	Work package

Executive summary

This document has been considered a living report of the activities and progresses in the development of the MOVING Mountains App.

The MOVING Mountains App (App in short) is the result of task T1.6 of Work Package 1 (WP1: Integrating research with Dissemination, Exploitation, Communication and Outreach activities) of the EU H2020 funded project MOVING.

In the first section “Methodology”, this document reports on the roadmap of the development activity and the corresponding actions.

A list of preliminary requirements has been produced and represents the input to a design phase during which, the software architecture and the functional aspects have been established.

The development delivery plan indicates when the App results will be shown. The first version, of June 2022, reports on the development’s state-of-the-art. The second version (intermediate), reports about the state of the art of development activities in September 2022. The final version represents the feature complete version of the App delivered at end of 2022.

The App development has progressed with a few minor and foreseen deviations, mostly related to ideas that emerged after the design phase and development process optimisations.

In January 2023 the App development will enter the beta testing phase where only maintenance activities will be carried out. After some weeks of tests, the App will be made available to the broader audience of the Moving community.

During this final adoption phase there will be some organizational points to be cleared up mostly related to how the App will be distributed.

1. Methodology

This section describes the preliminary work that has been carried out during the early months of 2022, the requirements that have been agreed upon by the Steering Committee on March 3rd, 2022 and subsequent communications with the project coordinator.

1.1. Preliminary requirements

In the context of Work Package 1, Nubisware has been entitled to develop the MOVING Mountains App (in short App), a mobile application that has the objective of engaging young and tech savvy people.

After getting involved in the activity, Nubisware has agreed with the steering committee a list of basic requirements, the architectural components to be used, a coarse-grained layout for the application and timeline for the delivery process.

The basic requirements are:

- Develop an application oriented to mobile devices for the MOVING Project.

- Support major device vendors: Android and iPhone.
- Member area for users registered to the Community of Practice.
- Upload media related to mountains and rural areas.
- Access feed of media produced by users in app and MOVING project site.
- Access public content such as news, blog, events about the project.
- Access community media in a geo-referenced way.
- Multilanguage.

Nubisware stated that the following list of requirements was out of its competencies and skills and needed some more discussions with the project's management bodies:

- Availability on official app stores.
- Technical support beyond project life.
- Commercial support and marketing.

1.2. Design

Due to the many open points and the tight schedule, Nubisware intends to reduce the typical risks that can occur during development by adopting an agile and flexible work strategy.

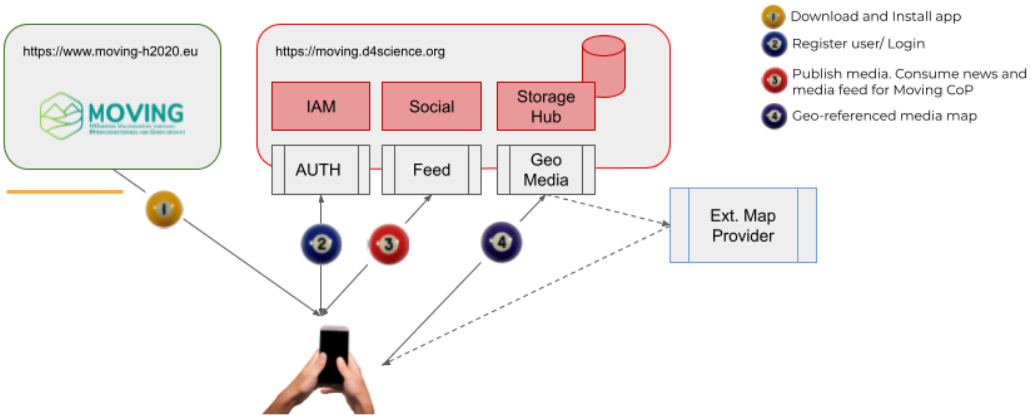
The focus is to start with a solid architectural background and to stay open to change and modifications during the development cycles.

Nubisware started activities by designing a sound and solid architectural plan for the development of the App. The plan takes care of exploiting as much of the existing technical infrastructure as possible leveraging effort and results achieved in the meanwhile by the project partners.

In particular, as shown in the following Figure 1, the following components are used:

- MOVING Project Site [1]. The result of Task 1.2 which contains a wealth of mediated and supervised public content about the project.
- VRE resources made available as a result of Task 1.4 such as Authentication and Authorisation service, Social Service and Storage service.
- An external Map provider that is able to provide open and free geo-referenced content that can be included without royalties in an open app such as the MOVING Mountains App.

Figure 1. Architecture.



Following the architectural design, Nubisware presented the overall layout for the App which consists of a rough idea on which are the screens that the App exposes with the content expected on them in addition to a description of a navigation among these screens.

The following Figure 2 and Figure 3, show the agreed overall App layout.

The overall layout is not to be considered mandatory and it should only give a global idea of what kind of features the App will provide. Some screens and features like for example the possibility to register to the Platform need to be investigated thoroughly and could be added or excluded in accordance to decisions which are not necessarily technical ones.

The App will for sure have a Title Screen with the title of the application.

Access to public, supervised and mediated content such as Project About, News etc, will be immediately reachable through a dedicated action (question mark in Figure 2).

A Community area, preliminary named as Home, will show the possibly geo-referenced feed of content produced by the users of the Community of Practice.

A user who has an account on the D4Science platform and is authorised to access VREs or Gateways related to the MOVING project (say the Community of Practice),can log into the application and at that point she or he will be able to post media files (pictures and movie clips) in order to contribute to the community feed. Which VREs or Gateways will grant access to this section is still under evaluation.

Figure 2. Overall App layout (I).

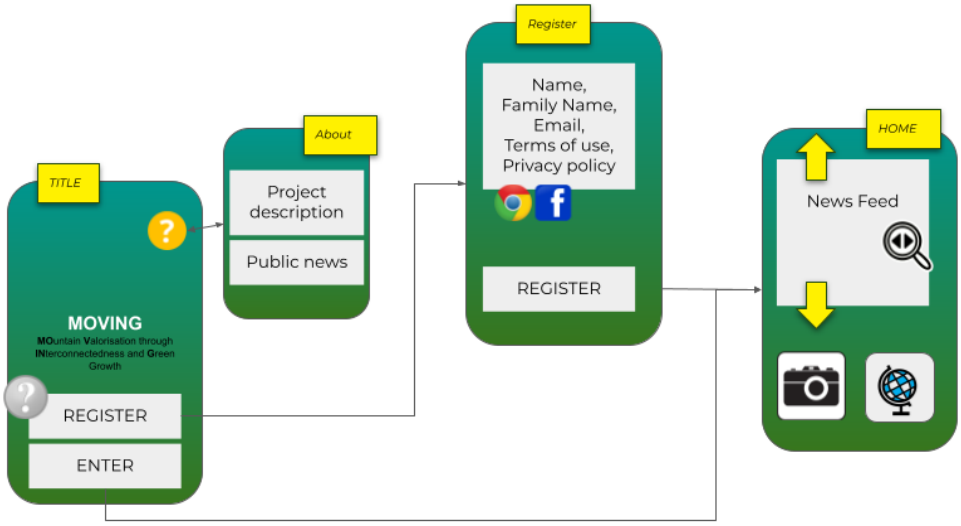
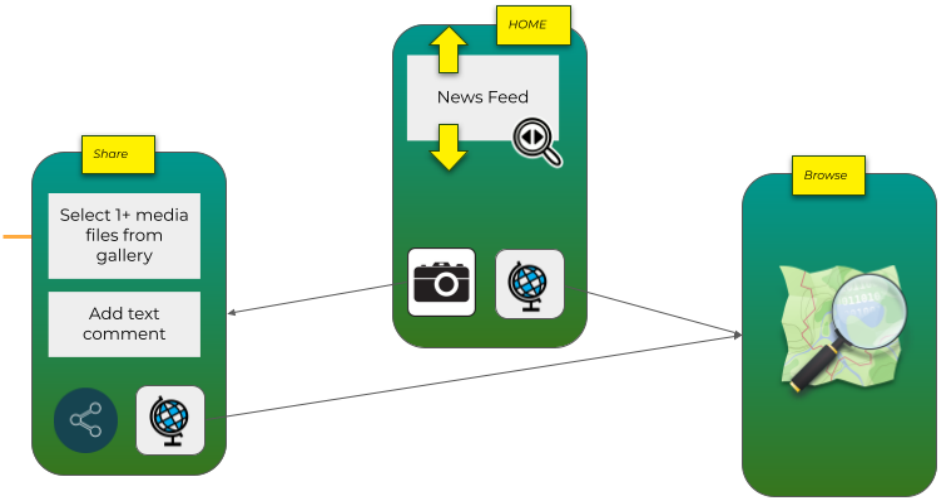


Figure 3. Overall App layout (II).



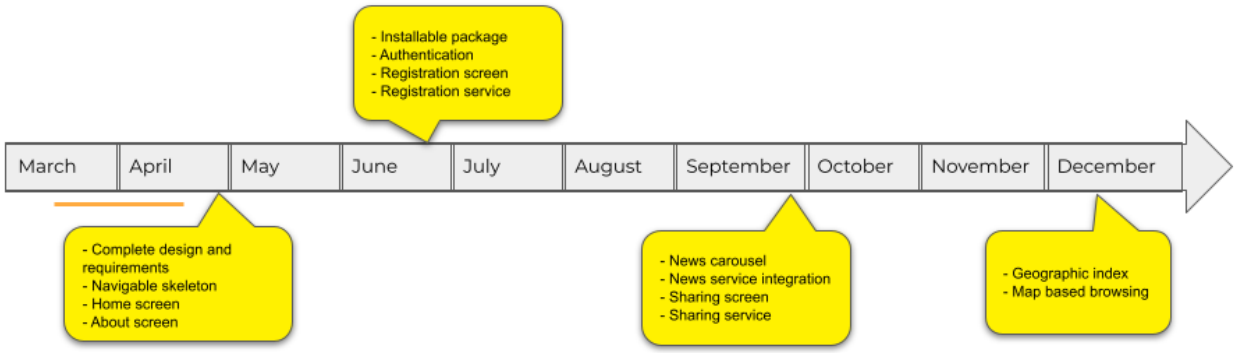
1.3. Plan

The following Figure 4 shows a preliminary delivery timeline that has been agreed with the steering committee. The Plan starts in March 2022 when Nubisware has been entitled to develop the App and sets the deadline of the activity to December 2022.

Like the overall App layout, the plan also is a rough idea on the activities that need to be carried out. Adjustments and reviews may occur during the development as always happens with agile approaches.

Thus, according to the first plan the milestones have been set to April, June, September and December 2022.

Figure 4. Rough delivery plan across 2022.



2. Progress Report

This section reports about the progress of the development of the App.

Possible deviations are added whenever they occur.

A list of open points for discussion is recorded in order to keep track of issues to be faced together with the project's management bodies.

The whole section will be kept living and updated according to the plan of Figure 4.

2.1. State of the art

2.1.1. State of the art at June 2022

By the end of June Nubisware presented the first prototype of the App containing many of the expected features even if not fully developed.

The Title Screen has been developed.

From the Title Screen it is possible to navigate to the About Screen containing a more detailed description of the project.

The concept of Home Screen has been reviewed and has become the page that groups together News, Blog and Events. Actually, the public content that is accessible from the MOVING project website. On these pages, content is shown according to a "vertical infinite scroll pattern" which is pretty convenient for feeds like these.

From the Home, it will be possible to enter also the Community Page which is able to show its content according to an infinite scroll pattern but also in a geo-referenced way. The type of presentation can be switched to a proper action button at the bottom of the page.

The plus sign on the Community Page is the action button to start sharing content on the MOVING social service. In order to proceed with this activity, the user needs to have logged

into the D4Science platform at least once. This security measure is required in order to grant correct ownership of the content that is being uploaded.

At the moment this operation is the only one that requires authentication and authorisation.

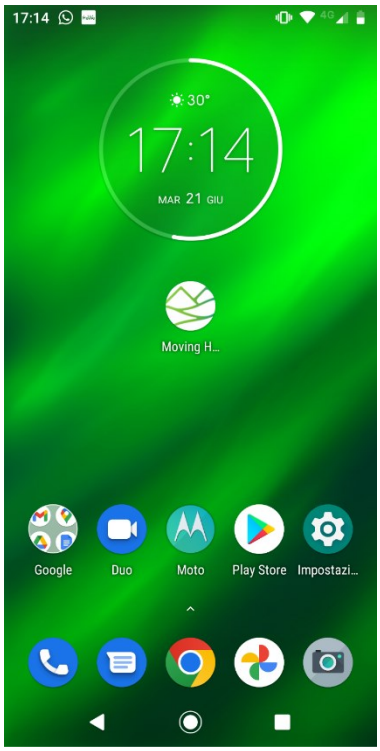
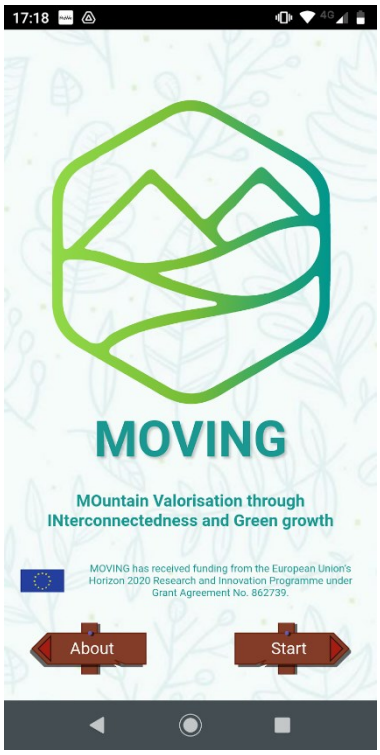
The login process is implemented according to industry state-of-the-art procedures.

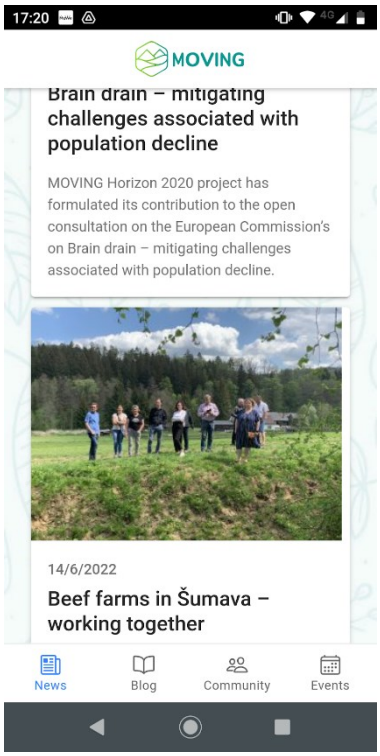
It is a browser-based, OIDC [2] compliant flow completely delegated to the D4Science Identity and Authorisation Management System. This avoids the necessity to share the users' credentials with the MOVING App.

The set of screenshots in Table 1 shows the current state of the art of the App.

An emulated and testable version of the App is made available for browsers at the following address https://cdn.dev.d4science.org/movingapp/phone-preview.html. In this emulated version, only the login to D4Science is not working yet.

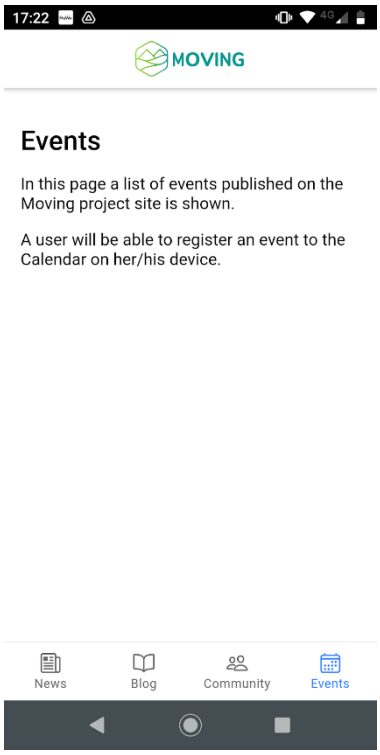
Table 1: Screenshots showing the current state of the art of the App

		
The app on the phones home screen	Title Screen (I)	Title Screen (II)

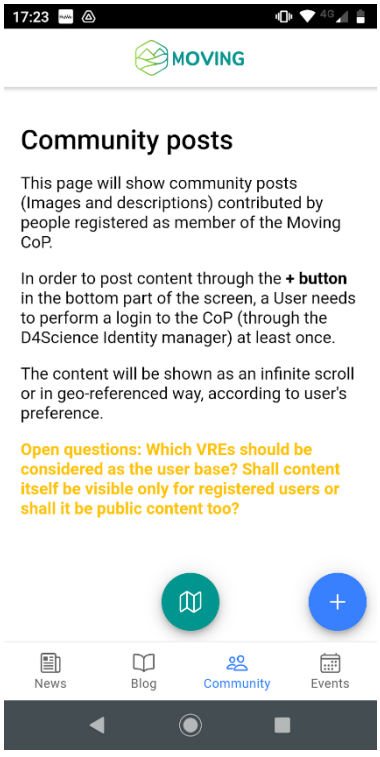


News Screen

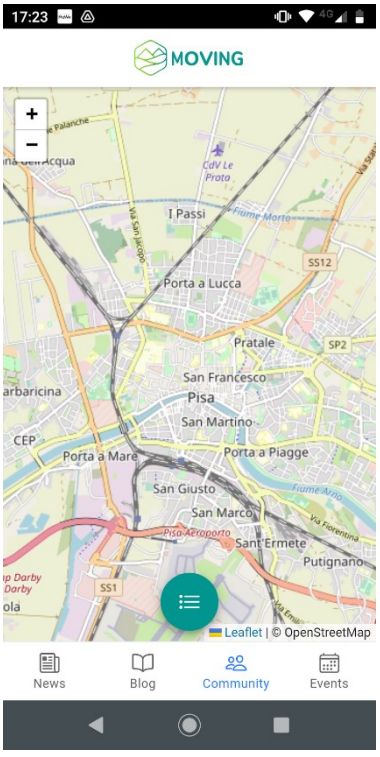
Blog Screen



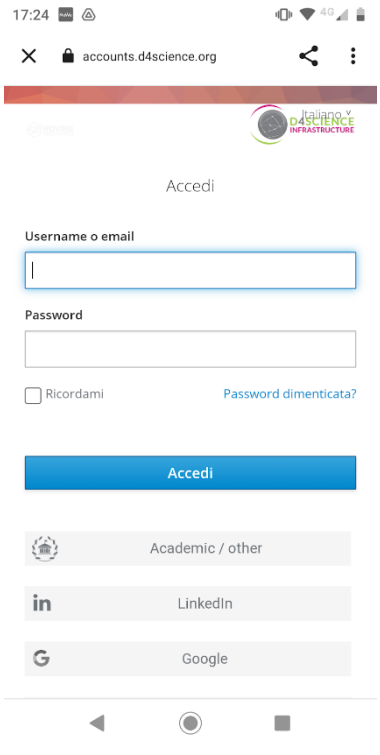
Events Screen



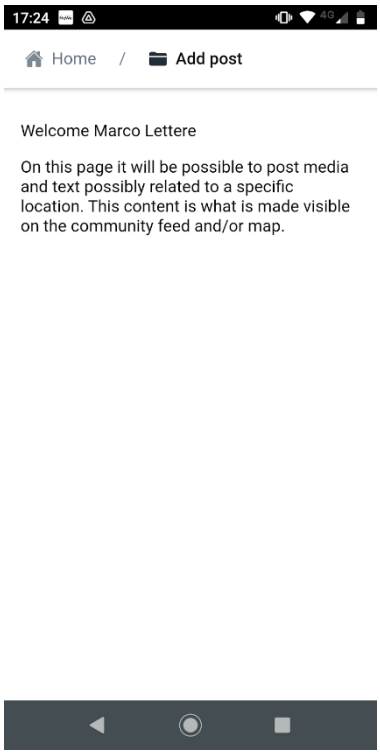
Community Screen



Georeferenced Community Screen



Login screen on D4Science



Upload screen with identified user.

About Screen.

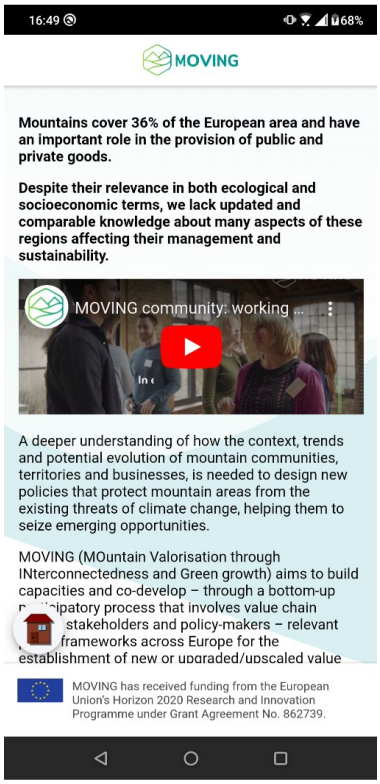
2.1.2. State of the art at September 2022

By the end of September Nubisware presented the second prototype of the App containing two more of the expected features.

The Project's About page has been integrated with all the content including the carousel of Project Objectives.

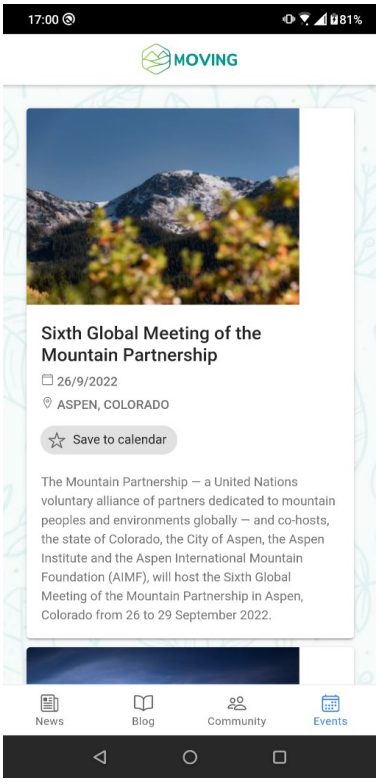
The Events page shows future events only, ordered by date. Moreover, on smartphone and tablet devices, this page allows a user to save the date of preferred events on her or his personal calendar, in order to receive notifications.

Table 2: Screenshots showing the current state of the art of the App

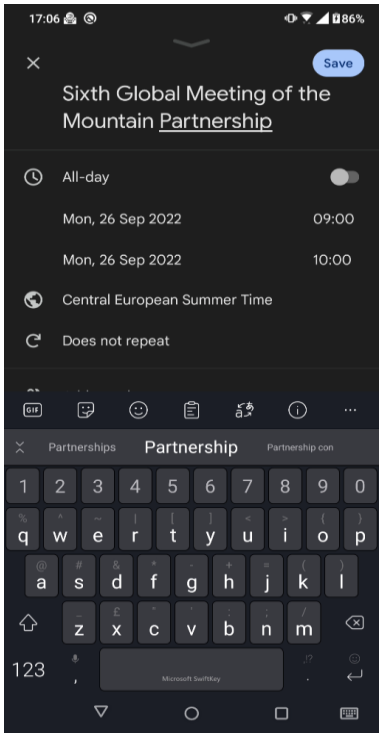


About Screen 1/2

About Screen 2/2



Events Screen



Save event on calendar

2.1.3. State of the art at December 2022

By the end of December Nubisware presented the third and final prototype of the App containing completing all of the expected features.

The D4Science Social Service has been integrated in the Community page. It is now possible to post messages to the Moving Community inserting text and attachments in the form of pictures or documents. Optionally it can be requested to notify about the new message all the members of the community.

Pictures can be taken from the gallery or from the integrated camera on mobile devices.

In addition the D4Science Social Service has been augmented to incorporate a geographic indexing service. This allows post to be georeferenced.

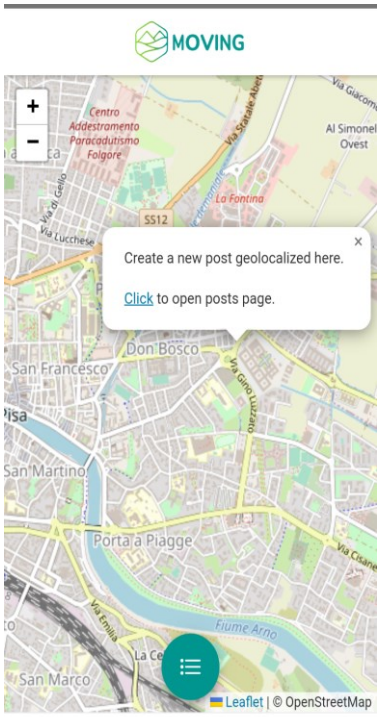
A georeferenced post can be created by clicking on the geographic map available as shown in Table 1. The map is also able to show posts that have been created and georeferenced in a given area. By default the map shows the area surrounding the current location of the user when the mobile device is able to get this information.

The development process is completed at December 31st 2022. Early January a first version of the Moving App will be distributed to a selected audience of beta testers. The development team will enter the maintenance mode.

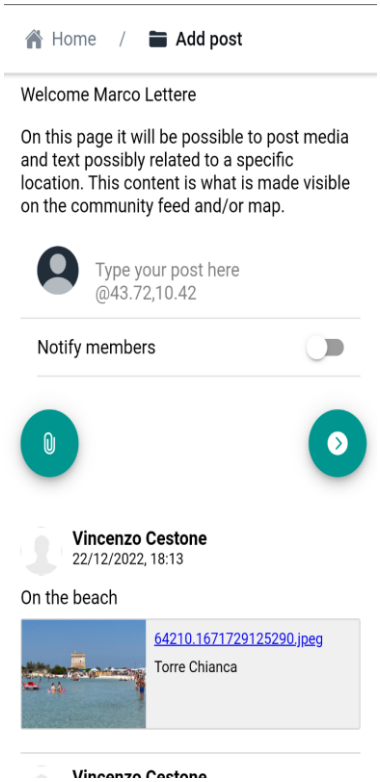
In the following weeks the audience of users will be progressively increased upon indications of the coordination team.

In the meanwhile the coordination team will take the decision on how to distribute the application officially as pointed out in the discussion of section 3.2 Publication of the App. Two example projects that have produced mobile apps are c-mobile [8] and Smart4Health [9].

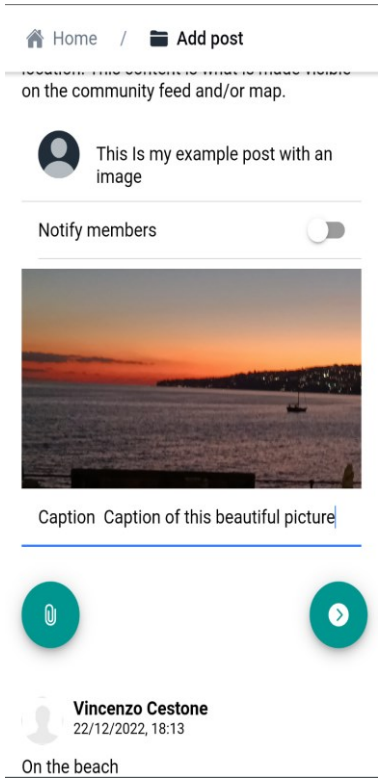
Table 3: Screenshots showing the current state of the art of the App



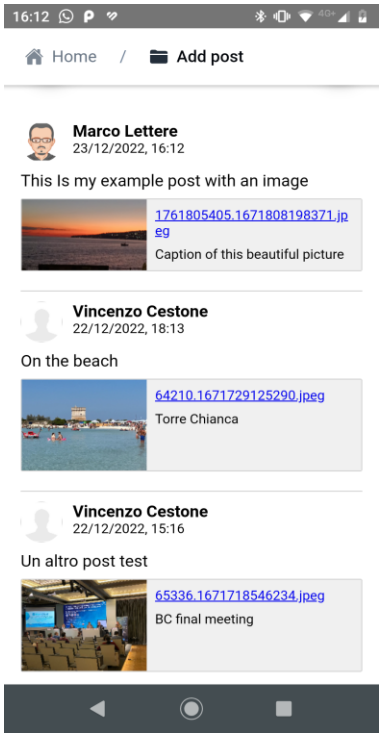
Post from geographic location



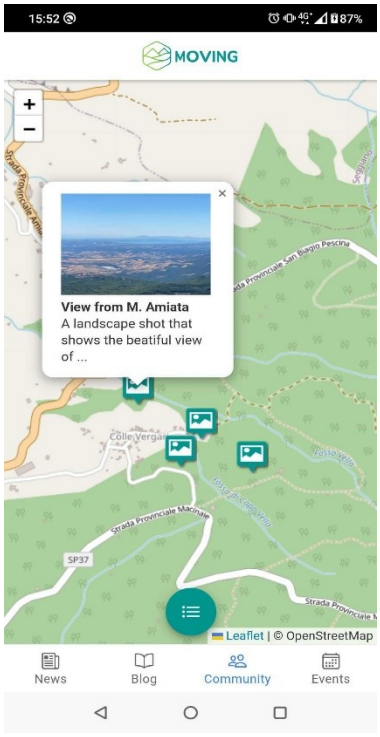
Social feed with post form



Writing a post with an image



Social feed with new post



Geo-localized social feeds

2.2. Deviations

2.2.1. Deviations at June 2022

There are no significant deviations by the end of June 2022.

As expected, some of the activities reported in Figure 4 have been shifted and exchanged with others. This is mainly due to decisions that aim at optimising the development process.

Other ideas on how to increase the appeal of the App have emerged during development and will be implemented.

For example, the presentation of other content in addition to the News section namely Blog and Events has been decided. In particular, the Event page will allow a user to save the date of preferred events on the calendar of her or his device in order to receive notifications.

During the Technical Committee of 22nd May 2022, partners CNR and Nubisware agreed to set up a meeting to discuss about the possibilities to integrate the Story Maps product created by CNR as part of T3.5 and D3.3 in the APP . Given that the related deliverable will be submitted to the EC by the end of August 2022, possible discussions could be retaken in September 2022.

2.2.2. Deviations at September 2022

We can confirm that there are no major deviations in September 2022 according to the technical development. Minor deviations of June 2022 have been addressed.

2.2.3. Deviations at December 2022

We can confirm that there are no major deviations in December 2022 according to the technical development.

3. Discussions

This section reports about two open points that need discussion and decisions to be made by the consortium and or Steering Committee.

3.1. Community of Practice

A functional decision is related to the identification of the audience for the Community Page described in previous sections.

This page requires the identification of users that are registered to the D4Science Identity and Access Management service.

The first point is related to the exact audience. Shall it be all the users that have access to the MOVING Gateway? Shall it be limited to the users of a particular set of VREs? Shall a new VRE be created for this purpose?

Another point is to decide whether registration of new users from the App will be allowed. This could cause, depending on the distribution of the App, an unsupervised increase of the user base of the Community of Practice.

A mitigation could be to launch the App without this functionality and possibly enable the registration only after more knowledge about the App's usage practices has been gained.

We think that these points need to be cleared up by requesting an opinion from the CNR staff involved in the management of the D4Science infrastructure for MOVING.

3.2. Publication of the App

A more administrative issue is related to how the App will be published on Marketplaces.

Nubisware is available for implementing the technical process and workflows related to the publication but there are several non-technical issues that need decisions to be made by the project's management boards or legal office.

In the first place the consortium needs to decide who will appear as the owner and responsible for the App and proceed with the creation of an account and possibly other administrative activities.

There are currently two dominant marketplaces for Android devices and iOS devices which are Google Play Store [3] and Apple's App Store [4]. Both marketplaces have rather strict and very specific policies and regulations. It is necessary to verify whether these policies are compliant with the EU regulation in the first place.

In addition, the App Store also has a pricing policy. If you are an organisation that wants its applications to be published on the App Store, you need to pay an annual fixed fee to adhere to the Developer Program [5].

There are opportunities to benefit from discounts for subscriptions to the program in presence of particular organisations but they are limited to geographic areas and countries [6].

As another opportunity, the MOVING mountains app could be published in alternative stores [7]. Despite reduced visibility, there could be a more suitable store that does not violate EU regulations or required fees.

The Project management team will check with the International Project Office (Legal) – UCO, the experience of other projects that have produced a mobile app as a result, and if there are best practices and guidelines on how to publish mobile apps developed in the EU funded projects' framework.

4. References

[1]	https://www.moving-h2020.eu/
[2]	https://openid.net/connect/
[3]	https://play.google.com/store/apps

[4]	https://www.apple.com/app-store/
[5]	https://developer.apple.com/programs/
[6]	https://developer.apple.com/support/membership-fee-waiver/
[7]	https://thewebappmarket.com/alternative-app-stores/
[8]	https://c-mobile-project.eu/
[9]	https://smart4health.eu/