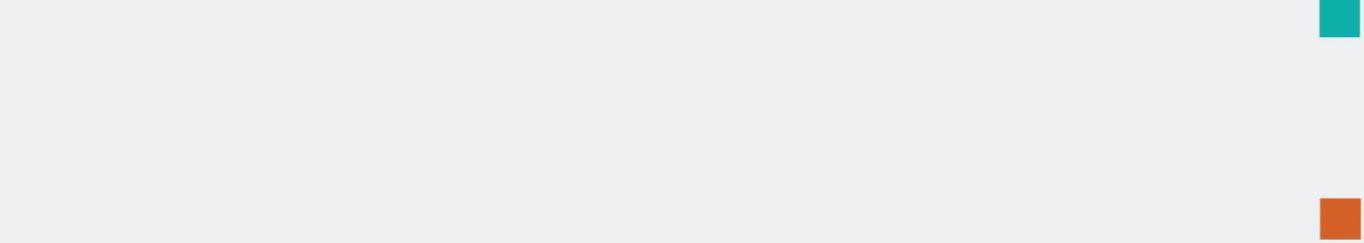
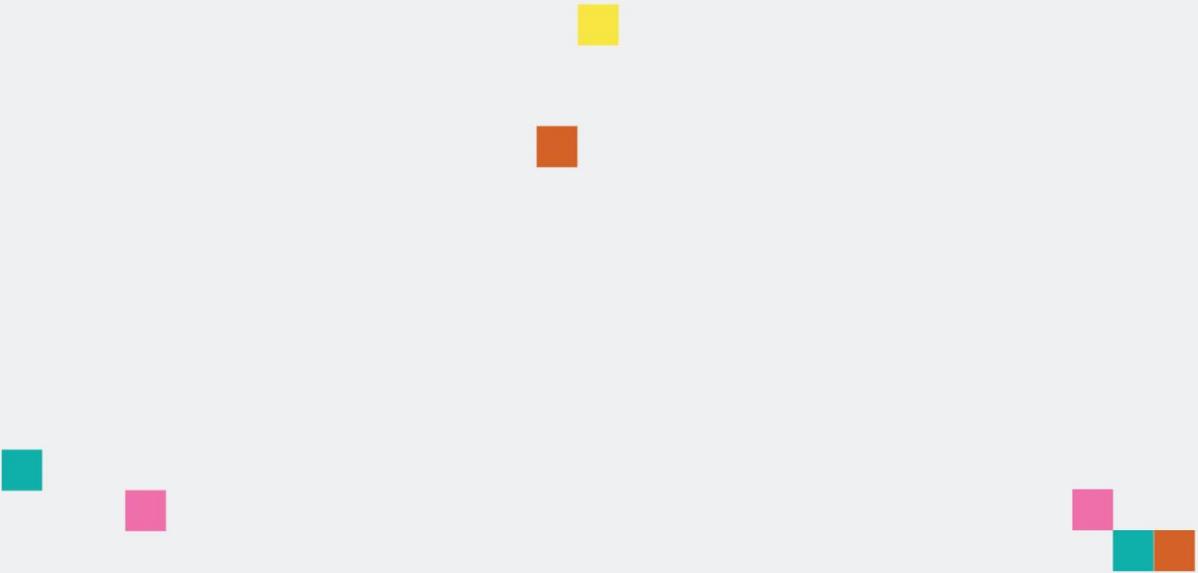




decode



**UX/UI for DECODE
app development
integrated to
BCNNow**



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Project no. 732546

DECODE

DEcentralised Citizens Owned Data Ecosystem

D4.10 UX/UI for DECODE app development integrated to BCNNow

Version Number: V1.0

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Approved by: Francesca Bria (Chief Technology and Digital Innovation Officer, Barcelona City Hall)
Date: 31/07/2019

This report is currently awaiting approval from the EC and cannot be not considered to be a final version.

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Introduction

This short document is intended to be distributed with the [wireframes and prototype](#) of the DECODE APP v2.0. Those wireframes are the basis upon which the second version of the DECODE App (link to [store](#)¹ and [repository](#)) is being developed. The wireframes design is intended not only to integrate with BCNNow, but with all the pilots considered in Barcelona (and described in the work package 5 deliverables).

The document is structured in two parts. The first part places into context the previous research performed in the project and introduces the main results of the research done to design the app. The second part presents the design decisions and philosophy behind the prototypes that are presented as well as the wireframes that will be used by the app.

¹ The current app available is not the one present in the repository. *Tester* rights are required to access the beta version, however, it can be run in simulator mode following instructions from the repository.

UX research²

While this deliverable belongs to work package 4 (WP4), it is important to emphasize its direct connection to both the earlier research performed in the WP by other partners, as well as the lessons extracted from the ongoing agile development in WP1 and specially WP5, which is the pilot's implementation WP.

As the project DECODE is advancing and its technology is maturing, most of its main objectives and motivations take form through an iterative and continuously evolving development process, from idea into implementation, testing with real users and communities and iteration. This fits perfectly the agile methodology followed in the inception, design and implementation of the various pilots in WP5, as explained in D1.1, most notably those in the Barcelona's pilots, well described in D5.2, D5.3, D5.4 and D5.5. The technical implementation of the requirements of those pilots has evolved, as seen throughout WP1 and WP4 (D1.4 most notably, but also D4.7 and D4.9) and the related smart rules embodied in [Zenroom](#) and developed in WP3.

The UX presented here tries to gather all the previous research, user as well as expert and technical feedback while preserving the project visual identity (D6.4).

Previous work

The DECODE app is the result of ongoing research in many fields: technological, social,, economic, legal and participatory among others. Thus, its UX and interaction dynamics have evolved in parallel to the evolution and refinement of the DECODE pilots, the community engagement, and their supporting technology.

Previous research on user experience was performed in the context of the pilots' inception in BCN (lead by IMI and Dribia), as well as the work by the Amsterdam partners (Waag and Dyne) and Thoughtworks on user interfaces and technical features. This research lead to the initial development of the first prototype of the DECODE app, with user research supported by UOC, Thoughtworks and IMI. At the point where DRIBIA joined the project, we used the base prototype and research to finalize, in close collaboration with Eurecat, Dyne and Thingful, a minimal viable product (MVP) that was successfully used using two versions (IoT and DDDC) for the Barcelona pilots.

The results presented here build on the feedback obtained by users, interacting with those prototypes and insights during the pilot testing process.

² All deliverables referenced in this document can be found at the project website (<https://decodeproject.eu/publications>).

UX methodology

The UX methodology followed for this design has been structured in two separated streams, aimed at testing different pilots and components with the idea of extracting common conclusions to produce the final wireframes for the app: IoT and DDDC context, with integration with the UX conducted for BCNNow by Eurecat.

We have balanced a qualitative with a quantitative approach, using personalized interviews as well as normalized forms to obtain statistics over users' opinions.

For the Decidim Barcelona, Digital Democracy and Data Commons use case, we have performed a large test with users during an open event in April 2, 2019, where we tested the application with Barcelona's citizens. You can see a summary of the open users event here: <https://elaragon.net/2019/04/02/decode-dddcfinale/>

After that, we also performed two users' sessions on June 5th 2019 and June 14th 2019 with 7 and 5 users respectively to refine the UX of the application, integrating more specific feedback. We used several versions of the app prototype as well as wireframes for the different sessions.

For the IoT/smart citizen case, besides continuous meetings with users (see D5.5 and related Deliverables), we have performed two specific user sessions at the Institute for Advanced Architecture of Catalonia (IAAC) in May 2nd and June 12th.

The materials used in the user sessions are documented in [the appendix](#).



Figure: Photos from different user sessions

Key insights from users testing

We have extracted two major lessons from the whole process of UX regarding DECODE. One on the technological aspect and the other on the purely user experience aspect of the actions.

On the tech aspect, we have realized that the use of distributed technologies and advanced cryptography involve tight restrictions in terms of interface design. Allowing a more democratic, accountable and controllable infrastructure means that actions that are *trivial* to enable for users in a centralized, server-dependent environment for an app, suddenly become hard to implement on other types of systems. Hence, UX and architecture are strongly tied and have strong dependency in this context. This means that accomplishing a *seamless* experience by users (one click log-ins for example) is very challenging. However, this is an important challenge for the DECODE project and

in general an area where progress is needed if we want privacy-enhancing technology to be widespread and become part of the daily toolkit of European citizens.

On the user experience side, the hardest challenge is to manage user expectations. The space of mobile applications has been quickly occupied by a paradigm where everything is extremely easy for users, who are perceived as clients (not active citizens with agency and rights) and do not hold any control over the internal workings of the service they use. The price to pay for easy usage is then that of control and data surveillance.

Trying to overcome this, besides technical aspects, is a matter of cultural change and education. Thus, supporting information (a web describing the DECODE app and its inner workings) must be presented to users as part of DECODE following deliverables, with the understanding that the vast majority of users will not be interested in what is presented there, but on the fact that such explanations exist. This recommendation is derived from our contact with users, which, seem to care much more about trust than they do about the technology used. They seem to follow a binary process of either trusting or not trusting apps, as they are used to do with the usual “term of service” contract. Hence, it is a hard challenge to transmit the idea of granular data permissions (entitlement) and granular trust regarding the use of internet services. We think that the insight gathered in this process working with users are very important for the field of privacy-enhancing decentralized technologies.

Lastly, in all interviews performed with various and diverse user profiles, there is an agreement that DECODE objectives are important for society, and that besides the proposed pilots, there is room and great potential to adapt to many more cases with the current infrastructure. However, all users expressed the need for a high level of adaptation to each concrete use case.

Decode APP UX/UI

Philosophy & design decisions

The continuous input from users, as well as the dedicated sessions have lead us to enunciate the following general key principles that guide our design (for details, see research notes):

- **Single purpose:** The DECODE app is a tool meant to allow users to control their personal data when using it interacting with services. It is founded on the use of personal data, external services, and cryptographic credentials (tools to validate certain claims about the app user).
- **Separation of uses:** Anything not related to the single purpose above will be referenced outside the app. Be it information, credential exploration or use of services.
- **Context:** The use of the app is based on the two-way journey: App-Service-app. This means that when users access the app to perform specific actions related to services, *they already have a frame and context* about the action that is about to be executed.
- **Generalization:** While the re-usability for the app with different services is obvious on the practical side, the weight of the adaptation lies on the service willing to use the app, that is, on the context provided to the user *prior* to starting the app to perform a specific action. The app is an app for concrete use cases that can be extended with development work to other services.
- **Detail:** The current app will be implemented for the DDDC and BCNNow DECODE pilot cases, while being designed to be compatible with the IoT pilot as well. The present work has laid the foundations also for relatively easy adaptation to the Amsterdam pilot use-cases as well.
- **Support:** For basic users, credentials and cryptographic details will be as hidden as possible to prevent confusion. For advanced users wishing to obtain more information, links will constantly provide access to external sources that explain in detail the actions that the app is doing. In particular, a web (aligned with DECODE milestones) will be provided specifically for the App with references and information, as well as links to repositories and source code.
- **Control:** Users will be informed at all times whenever their personal data leaves the device. Users will be actively informed that the app is self-contained and does not depend on an external server, with the price to pay on usability (inability to recover PIN or data).

Wireframes & Prototype

The resulting UX proposal is distributed below for the 3 main user stories identified. The rest of actions a user can perform are included in the ones below, for details the appendix can be checked. Also, the IoT case could be adapted to fit the current design, as it follows a clear mapping to the actions depicted here (for details, see D3.9 “IoT privacy-enhancing data sharing: integration with pilot infrastructures”).

All user stories are enumerated and can be checked in detail on the [user stories document](#). Their implementation in wireframes can be seen on [the attached PDF](#), where the stories happen sequentially. Note that the wireframes are in Spanish, to ease and simplify interaction with users from the focus groups. Also, on the prototypes the logo of the EC and acknowledgment of funding is not present, but it will be added on publication time.

User story 1: App navigation

- When? → User knows about DECODE but has never used it.
- What? → User wants to install and set-up the app, and explore its features (services and data).
- Why? → User wants to understand what the app does.

User story 2: DDDC petition sign

- When? → User is browsing the [DDDC site](#) and wants to support a petition using the DECODE App (which is installed).
- What? → **User scans the QR code** and prepares to sign the petition, while obtaining first a credential in the process.
- Why? → User knows what the app can do in DDDC and simply is using it.

User story 3: BCNNow log-in

- When? → User goes to [BCN Now](#) and wants to sign in using DECODE.
- What? → **User scans the QR code** and prepares to log-in.
- Why? → User knows what the app can do in BCNNow and simply is using it.

Conclusions

The UX presented here captures the basis of all the elements DECODE proposes to tackle, while leaving space for further improvements as more services are added to the platform.

It has been compiled leveraging on previous research performed throughout the project by a variety of partners working jointly. Furthermore, it has been validated with real users, capturing their feedback and evolving the prototypes iteratively, using different supports, and most notably, diverse pilot implementations.

On the one hand, one must note the main difficulties of the design process being the inherent complexity of the technology used in DECODE, as well as the ambitious objective that we are trying to address, with a single set of tools being designed to use for apparently very different use cases (the pilots). The other main challenge for the design of the app is the current world paradigm related to apps and data sovereignty: Users are not educated in the values of privacy and data control, and hence are habituated to extremely simplified and easy to use interfaces, which are supported by centralized infrastructures at the cost of extremely low levels of privacy, awareness and control by users.

On the other hand, the main strengths of the design and the process are that we have been able to synthesize a tool that can be used in multiple contexts and which is able to be extended with limited development effort. Hence, it is a founding stone for more services to be integrated into DECODE, which make use of data in a responsible way and giving sovereignty and control to people on its use, thus moving us closer to the main objectives of the project.

Acknowledgments

The work has been performed in close collaboration with IMI (lead coordinator of DECODE), Eurecat ([BCNNow](#) main developer), UOC (BCN pilots social liaison) as well as support in the IoT case from Thingful. Dyne has provided useful comments and discussion, feedback and contributed ideas and sketches for the wireframes for the app.

We would like to thank all the participants in the user sessions, as well as our pilot partners outside of the consortium ([MakingSense](#) and [Decidim](#) projects) for their support, comments and attendance to the workshops.

Appendix

All referenced documents are linked to existing links or can be found [here](#).

IoT UX sessions

- [Notes on session](#)

DDDC UX sessions

- [Notes on session 1](#)
- [Notes on session 2](#)

Wireframes

The wireframes have been developed in an iterative way following the feedback received from user sessions. Version 0 refers to the initial app used in the DDDC pilot trial, and successive numbers allow for further iterations.

- Wireframes obtained from earlier user sessions and used for DDDC trial, and tested in the first UX session:
 - [Wireframes v0.0](#) (used in DDDC pilot)
- Wireframes generated between first and second UX sessions:
 - [Wireframes v0.1](#)
 - [Wireframes v0.2](#)
 - [Wireframes contributed by Dyne](#)
- HTML Prototypes used in the second UX sessions:
 - [Prototype 1](#)
 - [Prototype 2](#)
- Wireframes generated after the second UX session:
 - [Wireframes v0.3](#)
 - [Wireframes v0.4](#)
 - [Wireframes v1.0 \(Final version\)](#) (PDF)

Detailed user stories

The detailed user stories ranked and generated in this design process are detailed in [the following document](#).