



decode



Final Report on Pilots Amsterdam and sustainability plans





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DECODE

DEcentralised Citizens Owned Data Ecosystem

D5.7 Final Report on Pilots Amsterdam and sustainability plans

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Abbreviations

AMS	Amsterdam CITY COUNCIL
ABC	Attribute Based Credentials
IoT	Internet of Things
IRMA	I Reveal My Attributes (App for ABC by RU)
MVP	Minimum Viable Product
TW	ThoughtWorks
TH	Thingful
WP	Work Package
WS	Waag
RU	Radboud University
PET	Privacy Enhancing Technologies
BCNNow	Barcelona Now (tool described in detail in deliverable D5.3)
SCK	Smart Citizen Kit

1. Introduction

This document provides a general overview and final review of DECODE pilot activities in Amsterdam. It is recommended that this document be considered in conjunction with D5.5 'Deployment of Pilots in Amsterdam'¹ which was published in March, 2019. As such, this document (D5.7) emphasises the updates from DECODE pilot activities since that time.

Specifically, this document reports on the final outcomes of the Amsterdam pilots and progress related to:

- pilot 1: the implementation of attribute-based credential (ABCs) into Gebiedonline (GO) through IRMA.
- pilot 2: the Anonymous Proof of ID (Formerly 'Claim Verification 18+') pilot.
- educational and engagement efforts (with governments in particular).
- governmental dedication to developing privacy enhancing technologies.

The document concludes with a discussion on the impact of the Amsterdam pilot on three significant target groups: governments, developers across fields, and the general public. People and organizations within each of these groups have demonstrated a development in their approach towards issues of privacy and digital identity.

1.1 Pilot Goals, Process, and Roles

1.1.1 Pilot Goals

According to the Description of Action², DECODE pilots had 6 general objectives:

1. Test and validate a set of technical building blocks for a distributed and privacy-aware data architecture open to broad adoption
2. Create actionable legal and governance tools for European citizens, companies and cities running on a distributed cryptographic ledger that enables disruptive commons-based business models intrinsically respectful of privacy and digital sovereignty.
3. Empower citizens to control and own their data.
4. Validate the platform with use cases providing public value.
5. Create a level playing field and impact through participatory innovation methodologies.
6. Contribute to an open standardization process in the fields of data portability, federated or distributed identity management, blockchains, and smart rules.

¹ <https://decodeproject.eu/publications/deployment-pilots-amsterdam>

² Found in Part B, section 1.1.2 of the DECODE Grant Agreement

During the course of designing pilots, additional goals were added and developed. As reported in D1.1 'Scenarios and Requirements Definition Report' and D5.5 'Deployment of Pilots in Amsterdam, the DECODE pilots are usable systems that promote the project's core values. The Amsterdam pilots took an **educational approach** towards citizens and public administrations, which is guided by the following:³

- Pilot partners aim to **build technical solutions that demonstrate opportunities** and possibilities in the realm of digital identity.
- The solutions should be **useable by the general public** and **provide a clear path forward for further development**.
- Amsterdam pilot partners utilize this technology as a framework to **educate people about DECODE values** such as privacy by design, attribute-based credentials, digital identity, data ownership, and data commons.
- Finally, the direct, applied, real-world effects of these pilots should clearly **demonstrate the benefits of DECODE values** to users.

Specific goals for each of the pilots individually can be found in the pilots' corresponding sections in D5.5.

1.1.2 Piloting Process

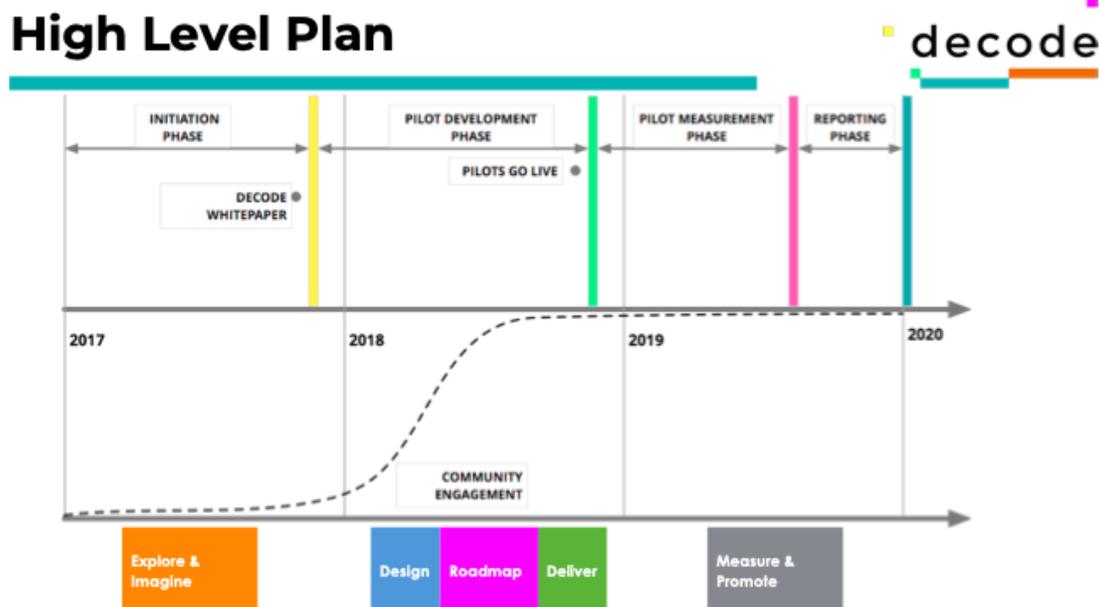


Figure 1: Overview of pilot phases in DECODE (from presentation during midterm project review).

³ These goals have developed from the DECODE criteria for selection, principles, and architectural themes described in D1.1. A summary of these can be found in Appendix 1.

As seen in the image above, both pilots in Amsterdam followed a similar trajectory over the course of three years. Generally speaking, 2017 involved planning and initial steps towards piloting, including the DECODE Challenge to identify pilots in Amsterdam; 2018 was the height of community engagement and pilot development, and included a number of workshops and meetups during which key aspects of the pilot were developed; and 2019 has seen the further iteration and improvement of these pilots, as well as the measurement, reporting, and dissemination of these pilot activities.1.1.3 Pilot Roles Amsterdam

In the Gebiedonline Pilot, the roles were as follows:

- **Coordinator:** Waag
- **Consortium partner(s):** Radboud University, Dyne, CTO Amsterdam
- **Pilot partner:** GO cooperative
- **Implementation partner:** CrossMarks
- **Community:** GO communities including *Hallo IJburg* and *Wij Zijn Nieuwland*. Dutch governmental bodies were also a target of educational and outreach efforts.

In the Anonymous Proof of ID pilot, the roles were as follows:

- **Coordinator:** CTO Amsterdam
- **Consortium partner(s):** Waag, Dyne, Radboud University
- **Pilot partner:** CTO Amsterdam, and later OIS Amsterdam (Office of Research, Information, and Statistics)
- **Implementation partner:** Dyne
- **Community:** policymakers, hackers and developers, citizens of Amsterdam

2. Gebiedonline Updates

2.1 About Gebiedonline

D5.5 'Deployment of Pilots Amsterdam'⁴ provided relevant background information on the Gebiedonline pilot including a description of the pilot's aims, a technical schema for integration of IRMA, and a plan regarding the dissemination of the pilot's results (with a particular focus on an educational campaign for citizens and policymakers).

Gebiedonline is an open source platform for community connections on a neighborhood level. The website provides the following description:

Are you looking for more connection in your neighborhood or village? Do you want to let other residents know what's going on? Or work together on what is important for the neighborhood? Gebiedonline offers a solution: An online neighborhood platform developed for and by neighborhoods⁵.

With the objective of improving users' security and privacy (verification), as well as enabling users to have granular control over the data they share, the Gebiedonline pilot proposed a set of features to be implemented on the GO platform using Attribute Based Credentials. By this way, this already popularized open source platform developed by Radboud University could achieve higher standards of data ownership, through the integration of IRMA, a platform that facilitates the use of ABCs (attribute-based credentials).

Furthermore, beyond the technical implementations, a discussion process was developed regarding the attribute-based credentials. In that regard, this previous report noted that the Gebiedonline pilot effectively provided the basis for further educational outreach about digital identity, targeting both citizens and public administrations to:

- inform people about ethical and technical issues and risks regarding digital identity
- inform people about digital identity, data ownership, and data management
- provide opportunities to address these issues through the uptake of technology

⁴ <https://decodeproject.eu/publications/deployment-pilots-amsterdam>

⁵ Translated from Dutch at <https://gebiedonline.nl/ons-platform>

2.2 Updates Since February 2019

D5.5 'Deployment of Pilots in Amsterdam' Chapter 2 provides detailed information on the development of the GO pilot through March, 2019. There are two main updates for the GO pilot since then: Firstly, **ABC features have now been implemented in GebiedOnline using IRMA⁶. This ABC login option is now available to all communities on GebiedOnline.** Secondly, **efforts to engage and educate policymakers and developers in key contexts have continued.**

2.2.1 Update on (Technical) Implementation of ABC Features into GO

2.2.1.1 Timeline of Updates

The process of implementing ABC features into Gebiedonline involved the following meetings and workshops with representatives from Waag, GO, IRMA, and citizen communities:

- February 15, 2019: General assembly at Waag including DataVakbond, a member of the European Parliament, and a member of the Dutch privacy authority (AP). <https://waag.org/nl/event/meetup-datavakbond>
- February 25, 2019: Citizen Panel — Do you trust your city with your data? <https://waag.org/nl/event/citizens-panel-amsterdam>
- February 28, 2019: Data Union Fork 'Tools for a data strike' with artist Lara Blazic <https://waag.org/en/event/data-union-fork-tools-data-strike>
- March 18, 2019: Presentation to the board of GO. This meeting included Waag, the GO board, as well as people from across the Netherlands who use the GO platform. 4 communities expressed interest to take part in the subsequent piloting phase. After following up with these communities, an Amersfoort community (Nieuweland) was selected for specific piloting.
- May 1, 2019: Workshop (tech team of Waag and CTO of GO) This meeting provided an update with Michel Volkler (head of GO). Those present identified needs to move from test to implementation.
- May 8: Workshop in which the tech team of Waag and CTO of GO met to further preparations for ABC launch with GO.
- June 12, 2019: Presentation in Amersfoort for the board of the local community in Nieuweland. At this meeting, IRMA was demonstrated in the test phase.
- June 28, 2019: Amsterdam GO communities were presented to about how they can login to GO using IRMA.
- Throughout Summer 2019: Crossmarks implemented DECODE, negotiated and discussed the schema definition 'scheme of their credentials' with Waag

⁶ This implementation was based on the schemas provided in D5.5 Deployment of Pilots Amsterdam

(mediator) and IRMA. This included technical testing and debugging of the login features and various scenarios using different operating systems.

- October 1: final event / IRMA launch in Nieuwland (Amersfoort) plus forward / future looking workshop: community health care scenarios enabled by ABC-technology.



Figure 2: General Assembly at Waag. Photo from <https://www.twipu.com/datavakbond>

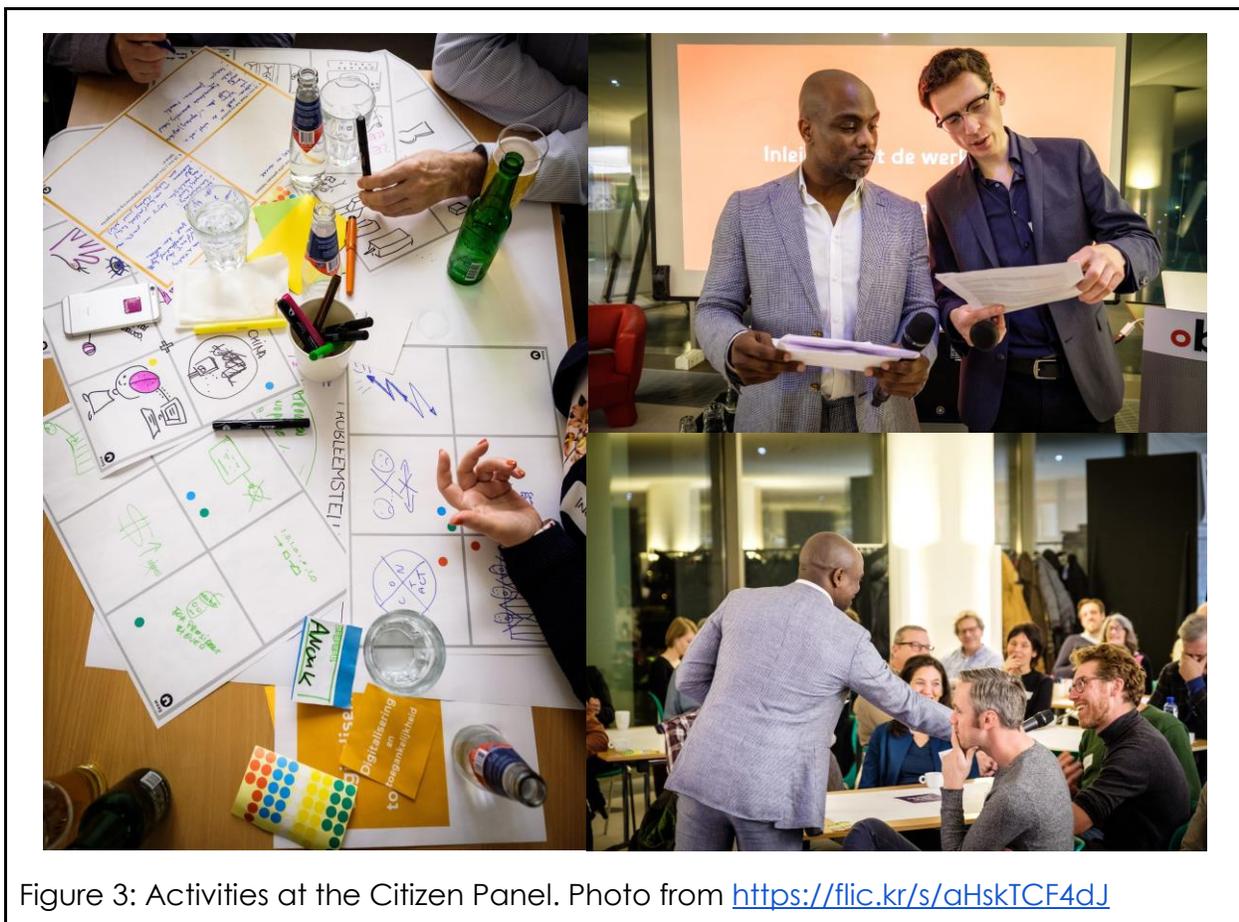


Figure 3: Activities at the Citizen Panel. Photo from <https://flic.kr/s/aHskTCF4dJ>

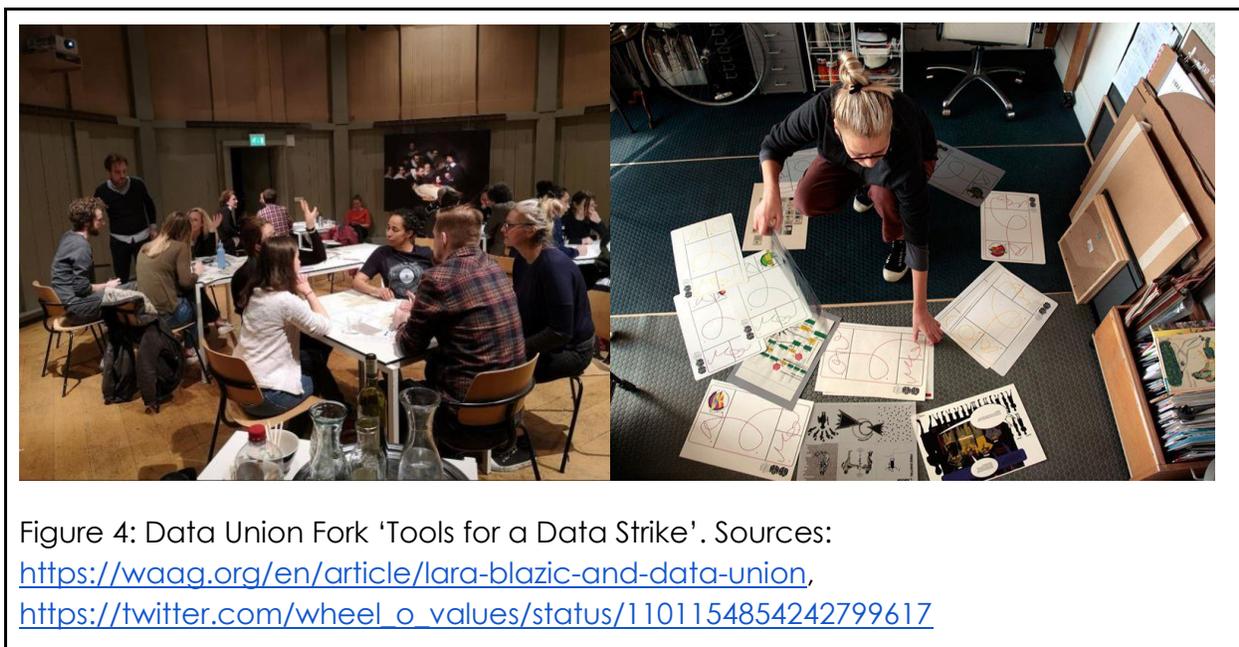
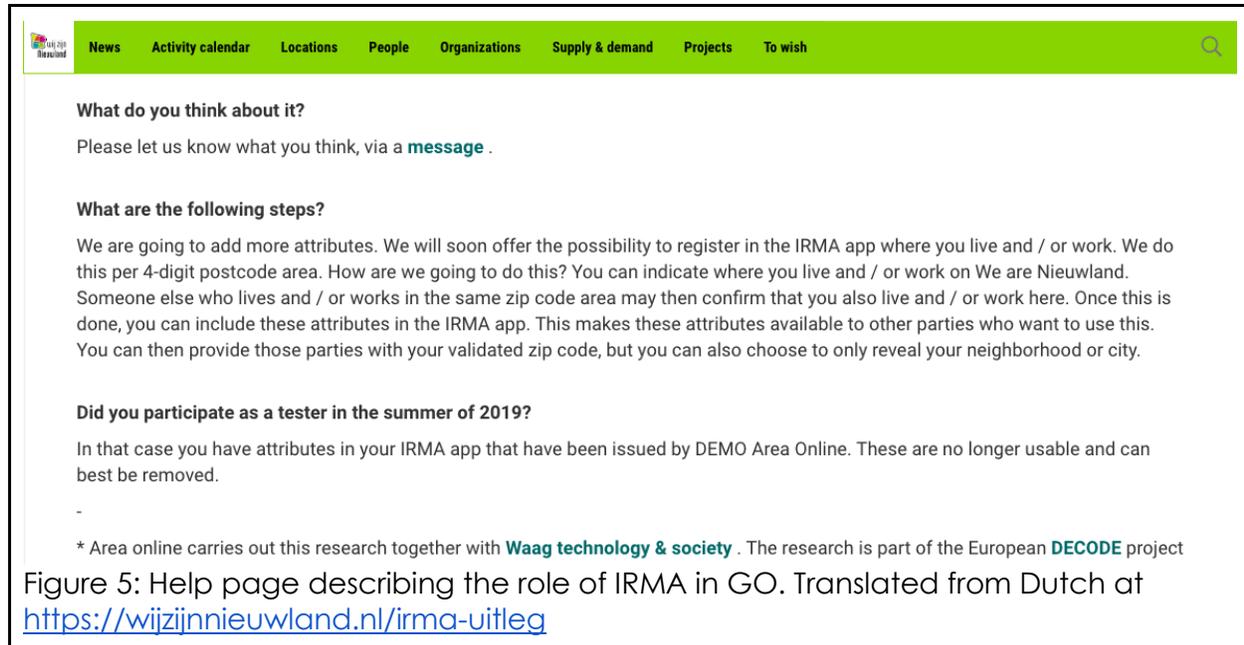


Figure 4: Data Union Fork 'Tools for a Data Strike'. Sources: <https://waag.org/en/article/lara-blazic-and-data-union>, https://twitter.com/wheel_o_values/status/1101154854242799617

2.2.1.2 Example User Journey: Logging into GO with IRMA

The *Wij Zijn Nieuwland* community hosts a page which provides detailed instructions for those who wish to be log in using IRMA (in Dutch) at <https://wijzinnieuwland.nl/irma-uitleg>. More information about IRMA generally can be found in English at <https://privacybydesign.foundation/irma-explanation/>. This following section follows an example user journey of logging into Gebiedonline with IRMA.



Step 1: Access the login page. This is possible by adding '/irma' to the end of a GO community's URL. The image below displays this page for the *Wij Zijn Nieuwland* community at <https://wijzinnieuwland.nl/irma>.

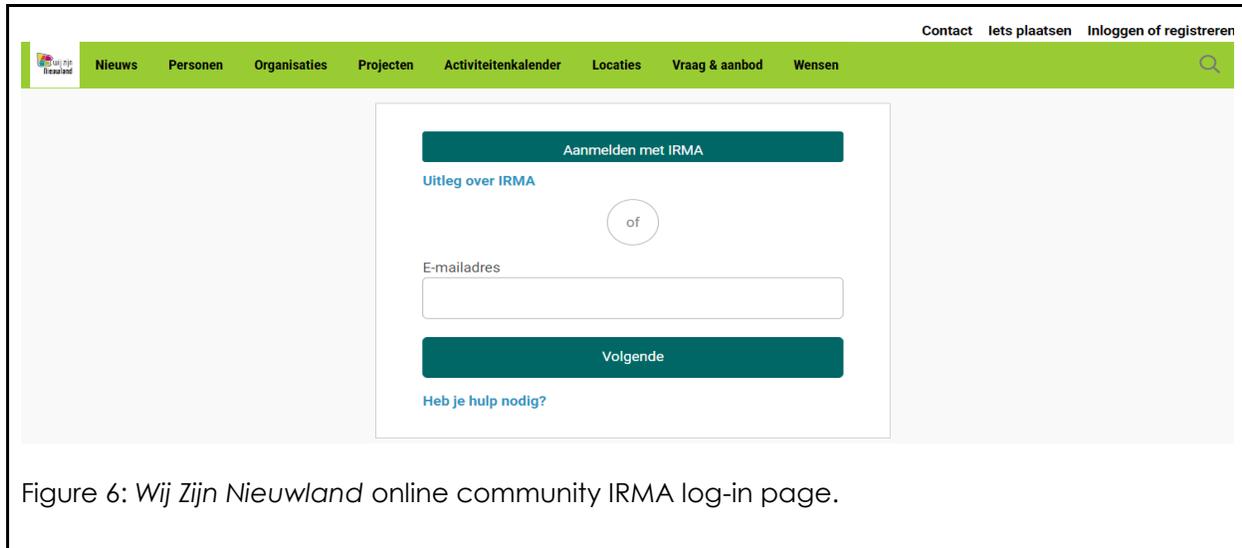


Figure 6: *Wij Zijn Nieuwland* online community IRMA log-in page.

Step 2: Open IRMA⁷, Scan a QR code from your computer screen with your phone, and enter your security code.

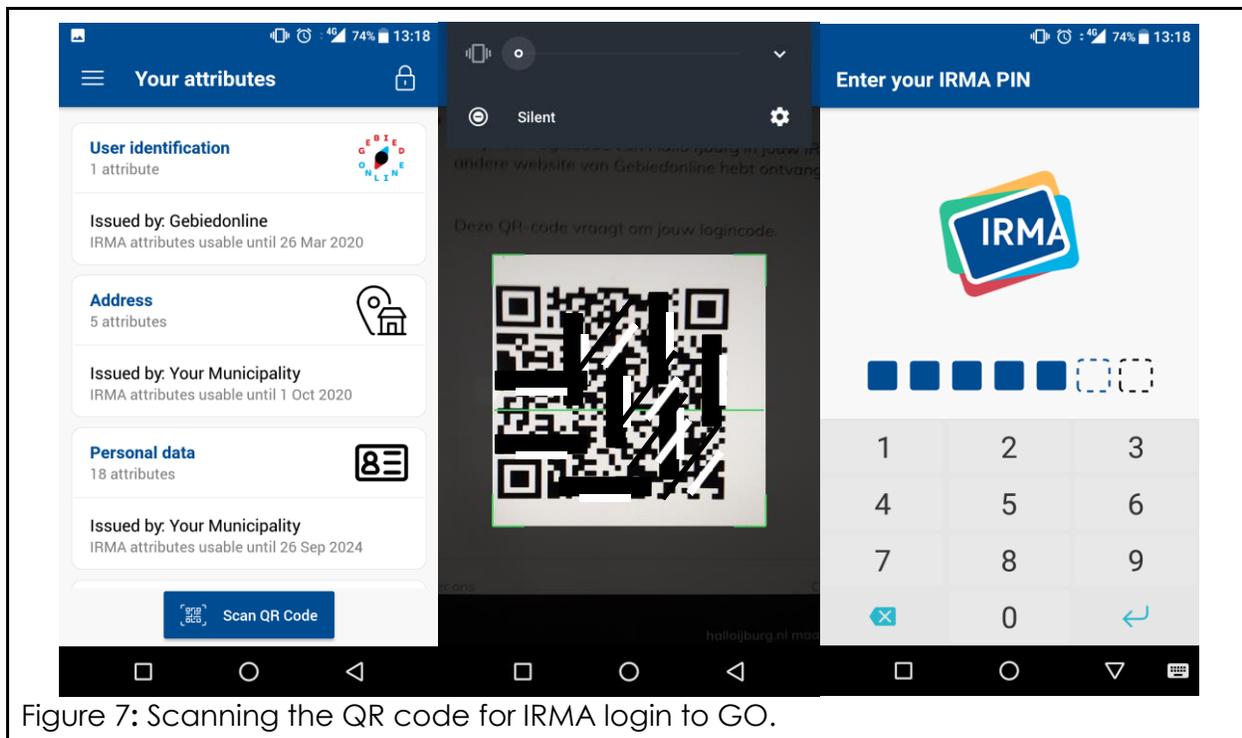


Figure 7: Scanning the QR code for IRMA login to GO.

⁷ IRMA can be downloaded at <https://privacybydesign.foundation/download-en/>

Step 3: Agree to share credentials from IRMA to GO and receive confirmation that you have successfully logged in.

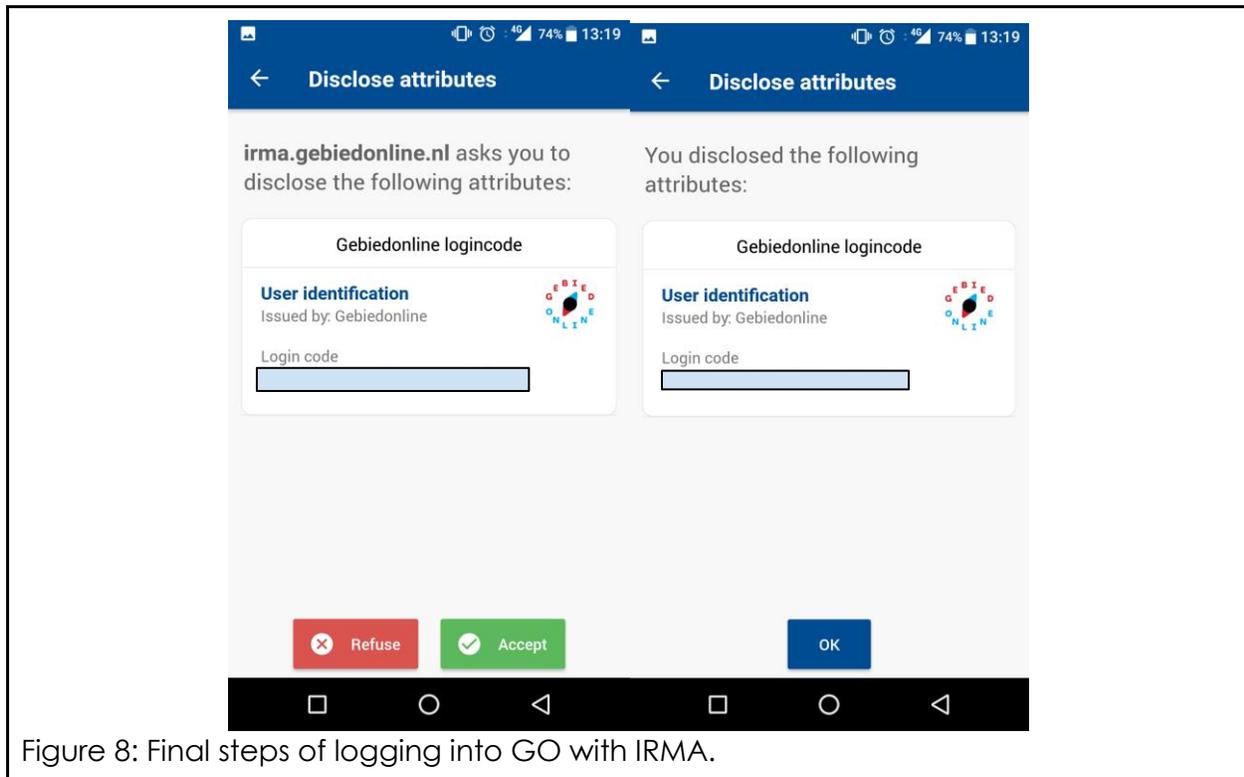


Figure 8: Final steps of logging into GO with IRMA.

2.2.2 Update on (Educational) Engagement of Policymakers, Developers, and Citizens

Since the previous reporting, pilot partners in Amsterdam have continued their efforts to educate policymakers, developers, and the general public on issues related to digital identity. This was done in part through the following events and sessions:

- June 19, 2019: 'Cities for Digital Rights' in the Zuiderkerk⁸, a conference where DECODE partners Waag and CTO Amsterdam took part in answering the question: *How do we protect civil rights in fast digitising cities?*
- July 3, 2019: DECODE presented at 'iBestuur Congres', an informatics/IT conference for Dutch municipalities and governments.
- September 11, 2019: Presentation and workshop at the Haarlem municipality regarding digital rights, digital identity, and digital sovereignty.
- September 13, 2019: Waag hosted a workshop on stakeholders and use cases, posing the question: How to involve citizens in a debate on digital rights and digital sovereignty?
- September 25-27, 2019: Waag attended the MyDataConference in Helsinki⁹.
- September 25, 2019: Waag presented DECODE at the ProBus Business Club in Maartensdijk, Netherlands.

Key updates regarding the outcomes of this educational and outreach effort include:

- The Dutch Ministry of Internal Affairs has provided funds¹⁰ to several cities to experiment with privacy enhancing technologies, for example implementing IRMA into cities' digital infrastructures.
- SamenBeter has developed a series of use cases for how ABC and IRMA may be applied in the field of social healthcare in a digital context.
- Multiple municipalities who were involved in DECODE have continued to pursue the uptake of DECODE principles including data sovereignty, data privacy, and data ownership. This includes the municipalities of Haarlem, Leiden, Amersfoort, Amsterdam, Almere, Nijmegen, and Groningen.
- There is interest amongst policymakers in pursuing the development of a national system for regulating home rentals (such as AirBnB) which utilizes ABC to help protect the privacy of renters. Preliminary conversations between DECODE tech partners and Dutch municipalities are taking place in this respect.

⁸ <https://waag.org/en/event/cities-digital-rights>

⁹ <https://waag.org/nl/event/my-data-2019>

¹⁰ <https://www.digitaleoverheid.nl/overzicht-van-alle-onderwerpen/innovatie/innovatiebudget/toekenning-innovatiebudget-2019/>



Figure 9: 'Cities for Digital Rights' in the Zuiderkerk. From <https://flickr.com/photos/waagsociety/albums/72157709153891861>

3. Digital Identity Team Updates (continuation of Anonymous Proof of ID)

The Amsterdam CTO is continuing efforts to improve the Anonymous Proof of ID pilot while also taking substantial steps towards further addressing issues of digital identity. Moving ahead with the Anonymous Proof of ID, the Amsterdam CTO will continue:

- a number of smaller studies on further developed parts of the Anonymous Proof of ID app: the user interface, the visual style, the interaction model and micro-animations that support the use.
- a number of tests with proof of driving ability via the app: young people aged 16 and over can use it to demonstrate that they are allowed to ride a moped on inspection.
- tests with demonstrating age (18+) for buying alcohol.¹¹

An article highlighting this work can be found at the following URL: <https://data.amsterdam.nl/artikelen/artikel/een-app-die-alleen-deelt-wat-nodig-is/c66f85d4-a0f4-46b8-9455-5bf2cb00593f/>. The article (in Dutch) presents outcomes of the pilot, noting that a number of usage scenarios have been prototyped and submitted to a first group of users:

- Install the app and register
- Retrieve the data from the Personal Records Database (BRP)
- Demonstrate that you are older than 18
- Vote for a local initiative
- Log in at mijn.amsterdam.nl
- Forgot PIN
- Add identity card in the app
- Add driver's license in the app

As an outcome of the work done in this pilot, the 'Digital Identity' team was formed as part of the Amsterdam municipality's CTO. They are developing projects largely inspired by DECODE principles.

The Digital Identity Team in Amsterdam is implementing privacy-enabling authentication methods for citizens to access digital city services. The CTO will start with pilots and aims to slowly make the added protection available for additional city services accessible through the city's central authentication service. For example, where Amsterdam citizens can currently log in with DigId (a classic, centralised,

¹¹ This and more information is available in an online article in the Dutch language at <https://data.amsterdam.nl/artikelen/artikel/een-app-die-alleen-deelt-wat-nodig-is/c66f85d4-a0f4-46b8-9455-5bf2cb00593f/>

government offered authentication service), they will soon be able to do so through IRMA as well. This will be applied to areas like digital voting through the city's OpenStad service. The goal is that all aspects of Amsterdam's digital services will soon be supported with ABCs.

4. Final Outcomes, Sustainability and Legacy

DECODE began with the ambitious goal to engage and impact people from across society, particularly in terms of addressing governments, developers across fields, and the general public. One of the most lasting implications of this effort has been a noticeable development in attitude and approach amongst each of these groups: Instead of approaching technology in terms of 'I want it to work' or 'it has to be easy', there has been a perspective shift on technology, architecture, and how that relates to power, ownership, agency, privacy. Concepts including ABC, 0-knowledge proof, and encryption (and their importance) are all better understood. This shift is reflected in the actions taken by governments, the general public, and across sectors in fields including tech development and healthcare.

Uptake in government

Educational outreach efforts in DECODE have helped to raise awareness about issues surrounding digital identity at multiple levels in the Dutch government. In addition to the Digital Identity team created in Amsterdam, other similar dedicated teams/projects/efforts have also begun in cities around the NL. For example, the Dutch digital government agenda 'DigiBeter' is supporting a project with the Dutch VNG (union of municipalities) and Ministry of Interior in which municipalities will develop further applications of ABC within their digital systems. This project includes Almere, Amsterdam, Groningen, Haarlem, Leiden, Nijmegen, and Utrecht.

Separately, the Amsterdam CTO office and Digital Identity group are also developing another project, Dig.ID.Proef, which will allow for IRMA to be filled with with personal data from the Dutch central government. This effort will also be undertaken with multiple Dutch municipalities. It is the first proof of concept of proving identity through the central government in order to provide derivative identities for other ID tools. This raises the level of security from low to substantial within the Netherlands and helps enable the Netherlands to better comply with EU regulations.

Uptake across sectors

DECODE partners have collaborated with a number of organizations and projects over the past three years, many of which continue to build upon shared values:

- The WijZijnNieuwland community on GO has been working with the group SamenBeter. Now, the two groups are interested in continuing their work

together in the form of ABC pilots relating to social healthcare in a digital setting¹².

- Coalitions including the Tada manifesto¹³ and the Public Spaces manifesto have brought together a number of people, organizations, developers, and municipalities around shared values relating to privacy, data ownership, and digital identity¹⁴.
- In several GO communities, the site's collaborative backlog indicates a shift over the past three years from user experience discussions towards technical and political deliberations regarding how to best secure user privacy and agency on the website.
- IRMA has significantly improved and simplified their product with the help of DECODE partners, improving the ability for new users to implement ABC into their systems.

Uptake with the general public

People are demonstrating increased concern and understanding regarding the relationship between data, technology, control, and privacy. Interest in public events has been high, both in terms of small workshops as well as in larger events like WeMakeThe.City and the DECODE Symposia. A video series¹⁵ made as part of the Digital Identity Lab highlights the engagement of Amsterdam citizens in these subjects.

Key Outputs Pilot Amsterdam

The impact of DECODE pilots in Amsterdam is the result of a number of events, activities, and outputs. The following are some of the most impactful:

- **Wegingskader**¹⁶ is policy document to inform policymakers and provide them with recommendations in the fields of privacy and digital identity.
- **The Digital Identity Lab** was created to house the various educational outputs stemming from Waag's efforts to educate citizens and policymakers about digital identity in DECODE. This includes interactive games, videos, policy recommendations, responsive storytelling, blogs, and articles. Written and visual materials that have been created in the lab can be found online at <https://digitaleidentiteit.waag.org/>. An English version of the site, containing many of the resources which are relevant for an international audience, can be found at <https://policylab.waag.org/>¹⁸.

¹² More information on this partnership can be found at <https://wijzinnieuwland.nl/project/5515/samenbeter>

¹³ <https://tada.city/en/home-en/>

¹⁴ See <https://publicspaces.net/manifesto/> and <https://tada.city/en/home-en/>

¹⁵ <https://policylab.waag.org/article/video-series/>

¹⁶ <https://digitaleidentiteit.waag.org/artikel/wegingskader/>

¹⁷ Quoted from D5.5 Deployment of Pilots in Amsterdam

¹⁸ Quoted from D5.5 Deployment of Pilots in Amsterdam

- The **Passport Box and Web App from the Anonymous Proof of ID pilot** demonstrated a proof of concept for ABCs' capacity to authenticate (Dutch) government-issued credentials.
- **Gebiedonline users have a secure login option via IRMA.** Developers and volunteer community members with the site continue to implement further applications of ABC into the website.

4.1 Conclusion

Pilots in Amsterdam were successful in implementing privacy enhancing technologies into use cases that hold a relevance in people's everyday lives. The process of developing this technology was open and collaborative, such that the technology itself served as a springboard for further efforts in education and outreach. With both the GO and Anonymous Proof of ID pilots, citizens, policymakers, and developers were able to better understand DECODE principles through interacting with these tangible case studies on digital identity.

All of this work has culminated in a major shift in the Dutch context, towards the development of further privacy enhancing technologies. Public administrations have shown a willingness to adopt DECODE principles; developers have displayed interest and capability in developing privacy enhancing technologies; and citizens from the Netherlands and elsewhere have repeatedly demonstrated their interest in these topics and their desire for a fairer and safer Internet.

This process now continues through the work of Amsterdam-based project partners Dyne, Waag, and CTO Amsterdam, as well as through the influence that DECODE has had on outside groups.