decode

D6.5 Co-creation framework, methodologies and templates

DECODE

DEcentralised Citizens Owned Data Ecosystem

Dissemination level:		
PU	Public	X
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)	

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

Contents

Summary

DECODE develops and tests new tools to give people control of their personal data. The pilots in Barcelona and Amsterdam build an active, diverse community of people who are interested in using tools which give them control of their data.

The purpose of this document is to give insight into different tested co-creation methods that can be used with DECODE to create the best possible adoption of citizens, the most performing business models for companies and the most vital ecosystem for policy makers. It is a productive document for stakeholder coordinators, ecosystem managers and practitioners in pilots.

The first section shows how co-creation has been fruitful and productive in earlier connectivity paradigms before Internet of Things. Smart gadgets, smart offices, smart streets were built in the 90s, but as this was before the Cloud (and unlimited data storage) all these attempts remained demos. Co-creation is the key to creating successful services and products[1]

DECODE follows an Agile methodology where pilots were selected through a series of agile inception workshops and co-creation workshops with user communities (see D1.1 for details). The second section describes how co-creation has become a way of working with end-users, industry, service providers as well as policymakers. Ecosystem building is more than partner management or stakeholder coordination, when it comes to new and emergent technologies and services, co-creation means that all stakeholders are ready to change according to a shared vision of the future, a vision that is uncertain.

The third section explains how we want to engage with all the groups in Meetups. We will describe three different templates that can serve as an initial try out to be iterated upon through the project.

The fourth section describes four co-creation methods or enablers that have been tested in other projects by dyne members for the Meetups to draw upon.

In the last section we explain how important creating a shared vision through using collaborative tools that includes internal stakeholders from the start. This is particularly true in a the Consortium with many partners with different institutional cultures, and with different use cases that involve users from divers backgrounds and with diverse needs.

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[1] A similar methodology was used in the EU IoT project SOCIOTAL: http://sociotal.eu

Section 1: Why smart cities need co-creation methods to be sustainable? An overview of co-creation methods applied in EU research programs.

The need to include end-users in every step of the process is grasped from the mid 90s. The EU *Future and Emergent Technologies Progr*am captures the necessity of non-technical research in the 1996 *i3: Intelligent Information Interfaces Research initiative*. It aimed to develop new human centered interfaces for interacting with information for a broad population. It had two follow up programs:

[i] *The Disappearing Computer* (*DC)* whose mission was "to see how information technology can be diffused into everyday objects and settings and t how this can lead to new ways of supporting and enhancing people's lives that go above and beyond what is possible with the computer today"', and *Convivio[ii]*.

Jakub Wejchert, project officer of *i3 and the Disappearing Computer Research Initiatives*, problematized the lack of diversity of kind of knowledges characterizing research into the knowledge-based society and asked how can different kinds of knowledge "ranging from the cognitively abstract, through to knowledge that is 'at hand' and embodied in our physical everyday world, to sequences of past events, and our memories of past experiences...'[iii] be actively supported foreseeing a world in which robots, humans and objects could co-exist and understand each other. The key word in the early projects is 'enhance'. One of the early projects *Living Memory (LiMe)* developed tools to enable local communities to share and capture a collective memory. It viewed digital tools (then called computer applications) for connected communities as a way of "enhancing the way people interact and socialize in geographically co-located communities such as neighborhoods.".[iv] To be able to enhance qualities of situations and experiences citizens in communities need to understand both the situation as well as the new elements. Co-creation means creating a shared understanding; it thus becomes a working and dynamic tool.

1. February 28, 2000 Time Digital: The Disappearing Computer. The article shows Europe leading in this field at the time.

One of the partners in *LiMe*, Philips, created an interactive (RFID) table that was placed in community centers and malls. In a short article Lessons learnt from *LiMe* (2003) Steve Kyffin of Philips defines co-creative design (co-creation) as "listening to and developing technology for ordinary people, involving the end user in a core and proactive manner at all stages in the product or system creation process." In is the 'ordinary...ness', everyday life that is the issue as the new practice becomes combining products and services to suit individual needs. At a very early stage he discovered that this had huge repercussions as design "must now respond to an economic model which supports the provision of converged and connected solutions". This means that the company itself changes and allows for more meaningful processes in house "to provide more holistic and relevant propositions within our commercial practice." [v]

In the days before the Cloud (around 2000) the demos of smart applications and services could not scale as there was no affordable data-storage. Internet of Things was then called ubicomp or pervasive computing or Ambient Intelligence. From about 2000 onwards Industry capitalizes on these early EU projects, enabling them to actualize the idea of the new more participatory user and user-centered design through co-creation. In the commercial Internet of Things world of today's platform wars are not so much on actual performance and capabilities of systems as they have similar functionality. The focus is on building long lasting and deep relations with developers, partners and facilitating the impact on real communities. Co-creation has become a vital business model factor.

Throughout the co-creation process in DECODE we will keep looking back and researching some of these old DC and i3 projects to build a viable and productive history of good practice in involving end-users as early as possible in design processes as well as to grasp their relevance for DECODE.

Section 2: DECODE Ecosystem Management

DECODE aims to take a different approach to the creation of smart cities by putting people in control of their data (smart citizens). This calls for an approach which uses co-creation because it introduces practical alternatives without immediately showing new value or services (rewards come through the actual use), and drawing them away from tools that have grown up with or are extremely familiar with. DECODE is focusing on citizens and their awareness regarding their rights and sovereignty in the digital society. These will not generate new services immediately. Its focus on 'people' is no longer novel as commercial and industrial companies are using the same language: Nokia, for example, wants to bring to our customers and to the world the idea that it is not about machines, "*it is about people.*".[vi]

In his article *How one European smart city is giving power back to its citizens Technology*, David Meyer claims city councils are waking up to the need for citizen-led smart cities but are still unable to answer the question "who owns the data that's at the center of this whole concept?"[vii] According to Francesca Bria, CTO of Barcelona and DECODE lead, the solution is to figure out "the city and citizens' needs, then looking at the appropriate technology and, according to Bria, making sure that the technology is open-source to maximize interoperability." (idem)
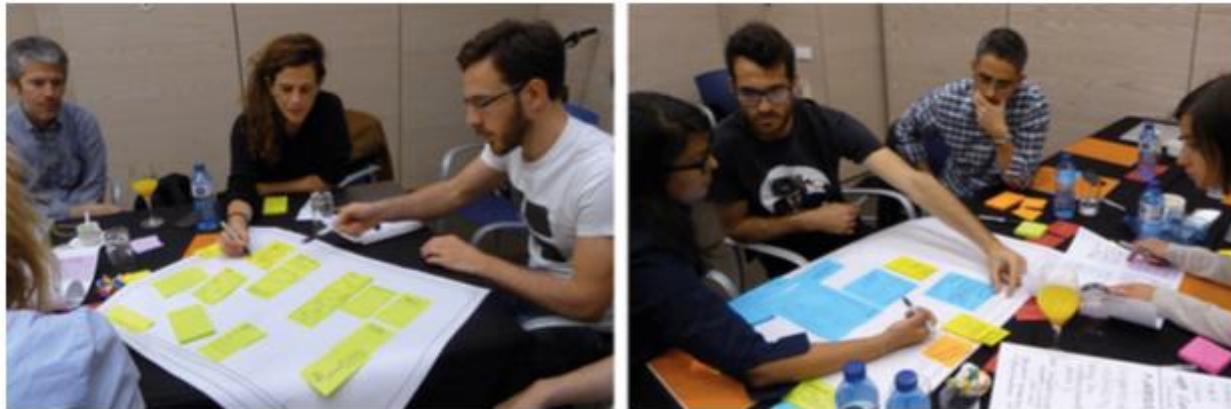
Citizens currently do not fully grasp what is going on in the backend of a city platform or city operating system (City OS) and why blockchain is so (radically) different. In DECODE this gap between citizen's expectations and understanding and the expert skillsets cannot be managed by rationally explaining what is happening. Co-creating experiences and shared situations is the most productive way to build a level of trust and shared understanding strong enough to move citizens away from their familiar interfaces into trying new services. As outlines by Barcelona CTO Francesca Bria "We are implementing DECODE so that the citizens can say, 'OK, I only want to share this data with my community, or with the city, because if the city gets this data, they can do something about the noise level'".

The templates for the Meetups are co-created through stakeholder meetings, inception meetings, the desk-research, co creation expertise and local ecosystem meetings. DECODE has now conducted two rounds of inception meetings in Barcelona and Amsterdam to identify the user requirements and social needs for the pilots (see D1.1 for details of the inceptions outcomes), like the examples listed below.

Meetups, Policy Meetings, Inceptions, developer and co-creation sessions align and converge into a DECODE Ecosystem aimed at enhancing the skill, expertise and knowledge of every stakeholder to this level of shared understanding data practices and daily use.

We aim to influence policy makers to ask the right questions and be alert to practical alternatives like DECODE in procurement and funding strategies. We want citizens to rethink their data

management. We want companies to stop authenticating with Over the Top Players like Facebook, Airbnb.

1 Inception1 Barcelona, May 2017

2 Inception 1 Barcelona Personas and empathy mapping

Meeting Amsterdam inception1: Gemeente Amsterdam: DECODE will join at fixed times actual change management methodology that will be in operation from 2017 in Amsterdam[viii]. DECODE can participate in the trajectories, identity the moments where its focus on data

sovereignty be injected (and thus made as modules), as well as be inspiring in creating timely Meetups.
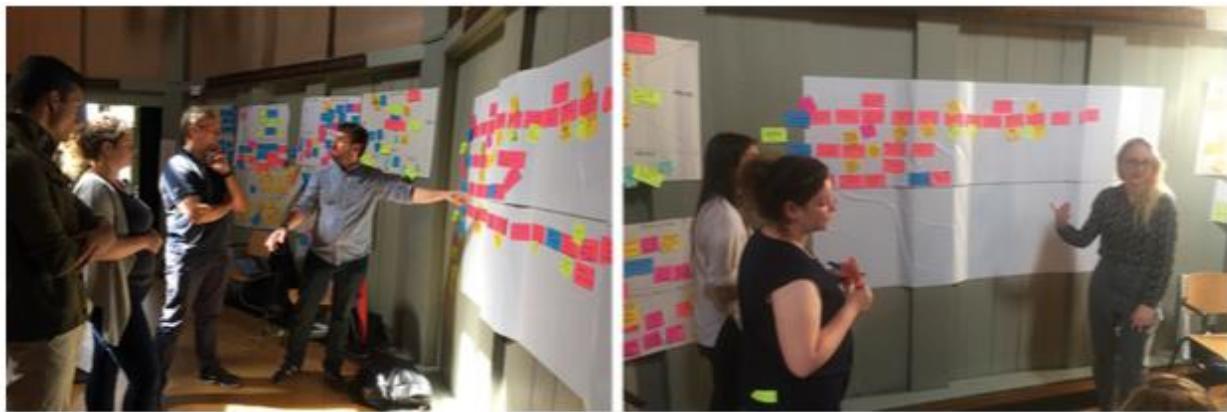
Meeting Amsterdam inception with communities: Fairbnb: What if, "in the world "of short-term accommodation rentals, guests, hosts and neighbors could collectively decide together with municipalities how to make the rental process fairer, more sustainable and more rewarding for the whole community?""[ix] Fairbnb is interesting for DECODE in the link between municipality and platform for a fair cash flow. A set percent of the incomes people make for renting their house will be transferred to the municipality with the single purpose of improving the neighborhood of the rented house. The insurance issue of the rented houses (who is responsible when something goes wrong?) makes this also an interesting case.

Inception II Amsterdam: A full report on the Inception week that took place from July 10 to July 15 with the Amsterdam pilot Gebiedonline (GO, a co-operatively owned online platform for neighborhood communities) is documented in D1.1. Currently 4.000 citizens of IJburg use the platform to create a wealth of information, without any centralized organization or editorial office. Goal: All citizens in local urban networks together create value with (and in) their own online platform. Local urban networks inspire and drive societal and democratic innovation.[x] The general problem faced by GO is linking existing data to new submitted data without creating duplication. By end of 2017:

- being able to run DECODE authentication in parallel with the GO authorities' infrastructure, perhaps verifying assumptions already present on GO database.
- aim towards implementing Fairbnb on top of existing infrastructure (maybe as
- part of GO, like the initiative for book exchange)

3 Inception I Amsterdam, June 2017

4 Inception1 Amsterdam, meeting with FairBnB community

Section 3: The Meet up Templates

DECODE is an experimental project to develop practical alternatives to how we use the internet today - four European pilots will show the wider social value that comes with individuals being given the power to take control of their personal data and given the means to share their data differently.

In this section, we describe three Meetup Templates.

5 Inception workshop II, Amsterdam at Waag Society, July 2017

Template of Meetup Co-creating a working model

Template: Half hour walk-in

Opening:

One hour Initiative X explains idea + technology

What is the problem?

How can blockchain/decentralization be the solution?

Under what circumstances this can work?

How do I know that this technology endorses my beliefs?

How does this technology change power structures in this domain?

What could be the effects of large-scale implementation?

How do you get citizens to be users of this alternative?

Co-creation of working model with multiple co-creation tools. Mapping, visualizing or make the story/scenario substantial so it becomes accessible to a wider audience, what decentralized or blockchain technology brings to this idea.

End with discussion & conclusion

The idea of these Meetups is partly based in the vision of users as designers. To put users in the designer seat, basic knowledge on blockchain technology is required. Only with this knowledge we can start co-creating applications and critical approaches to the technology. Part of the Meetups will be devoted to getting the general understanding of the potential of blockchain technology.

The Meetups are focussed on reaching new target groups in the pilot cities. These groups are people with their own ideas or projects in blockchain and people who are generally interested in the technology with questions on the potential of it. The Meetups are a way to explore which and if projects using blockchain technology and distributed ledgers will have impact on our societal challenges. Therefore we need them to be able to critically assess and research these projects.

The Meetups in the pilot cities have the following goals:

- Create a community in Amsterdam and Barcelona around the topic of decentralized and blockchain based technology solutions for societal challenges.
- Creating awareness for people who are interested in the topic but don't have all the knowhow on the technology.
- Co-create a policy ecosystem with local, national and EU policymakers and industry.
- Co-creating a 'working model': help people to understand the foundations of technology in such a way, they will be able to ask critical questions to blockchain initiatives and ideas.

The Meetups will be used for community building, co-creation and testing of DECODE OS and applications. Asking multiple stakeholders to work together, participate and co-create potential applications based on DECODE OS, but also bring a critical approach to other blockchain based technology.

A first investigation among DECODE partners mapped how close partners are to blockchain pilot's domains. Eurecat has contacts with researchers at Universitat Pompeu Fabra (UPF) in Barcelona, working on a project on blockchain in the domain of security and IoT (Automatic Topology Analysis for Distributed Anomalies Prevention Systems in the IoT)[xi] Waag has close

access and relationships with blockchain pilots in policy (1), p2p sharing (1), social networks (1). Universitat Pompeu Fabra has an active project on blockchain: "AUTODAPS is aimed at the analysis of well-known and effective topological data analysis approaches/tools and at the remodeling of such solutions for a blockchain-based IoT network. Unlike common networks, in our environment AUTODAPS will have to deal with virtual devices that can be arbitrarily and easily created/modified/removed by other devices within the network thus radically changing its topology. To do so, AUTODAPS will exploit already existing blockchain protocols (as bitcoins or other powerful solutions such as the Colored Coins) to spread some malicious software among the devices. Those infected devices will then be analyzed to understand and to model how they tend to behave within the network to extract topological information and to compare them with known results. With the obtained data, a topology-based Intrusion Detection/Prevention System (IDS/IPS) will be designed/developed that can autonomously and automatically adapt to different topologies and dynamically re-design anomalies prevention systems (APS) as the environment changes by exploiting isomorphism algorithms."

UOC (partner Dimmons) has few degrees of separation with the following: a pilot actively engaged in the blockchain community in Barcelona. The group participates and connects in different ways with administrations at the European, Catalan and Barcelona level regarding the Collaborative Economy. A researcher affiliated to the group has expertise and different contacts around the regulatory framework at European level.

Template of Meetup Co-creating awareness for people:

The Quadruple Helix Innovation model is used to specifically look at regional and local digital transformation. In this model governments facilitate funds and frameworks, companies and universities shape conditions for scaling, citizens apply and demand new services and play an active role. The digital itself is no longer merely enabling integration between these four actors but creating new conditions itself. These emergent conditions are mediated through bottom up and fringe artistic, cultural, and social activities. According to Cardiff "arts and artistic research, as a new form of creation and possibly also as a new form of knowledge creation."[xii] In line with recent innovation insights about this model partnerships like DECODE seek to realize a sustainable circulation of different kinds of knowledge. This template specifically focuses on the emerging (f)actors.

Template

Observation, narrative building and analysis:
- an overview of the place, and a basic map is drawn with official data, observations, a walk in the neighborhood
- the overview is used to create the ambience for the game
- a "book of stories" is initiated with basic findings and used to tell the story of the meetup to future participants, iterating in it. Can be just a shared pad.
- a group of people is selected and invited to join for a meet up in their zone on the theme of tourism
- the composition of the group is made for example as such:
 - two active Airbnb hosts
 - two home sharing
 - one that has a small business
 - two from a social project in the vicinity, either scouts, church, gardening, open library
 - one elderly person that volunteers in the area
 - a teacher that teaches a basic school in the area
 - some volunteers with experience in DECODE themes, and are available to act as facilitators

Introduction to the themes through a match of "le grand jeu"

- at the end of the game the group is confronted with the task of determine a set of questions to pose to their neighbors: what questions to ask, were and to who, and what time of the day is best to ask them? - an observer, external to the game, reads a list of stories that happened in the game - story of DECODE is re-iterated and the variations are noted. Have the objectives of DECODE changed to meet what has been found? Are these changes possible or just too complex?

- the book of stories is shared and opened for everyone to give input
- another "game session" is proposed

Metrics

- quality assessment on the type of questions emerging from the meetings
- number of people joining in a second time
- number of interactions between them
- follow up participation

Questions envisaged are:

Why should citizens trust this solution as fundamentally different from the others?

Are there new services, or are they offered the same functionalities in more granular and more 'difficult' interfaces?

Will they understand how important this first step is, acknowledging data as a key resource and entitling providers to enrich this, or will they think it will make no difference and keep using Facebook, Google, Airbnb, Uber as they do not understand how this initial act will affect these mega players?

What is the difference being woken by the sound of trolleys on cobbles if the tourists are coming through Airbnb or Fairbnb?

Template of a Meetup Co-creating Policy

DECODE is timely, and thus it is not the only project with similar goals.

In *Smart Decentralization: Moving From The Cloud To The Fog,* Dominik Schiener, Co-Founder — IOTA Foundation, asks what the evolutionary transition towards smart decentralization means for both the internet of things and our society? "With the introduction of blockchain, the internet of things will move away from the cloud and towards the fog[xiii] – something that in turn could give rise to a fully autonomous machine economy, one that no longer needs the intervention of human managers."

In his text *Liquid Democracy: True Democracy for the 21st Century,* he outlines how in this vision of liquid democracy delegation is a sign of trust: "a voter trusts a delegate to represent her on certain decisions. If this trust is broken (by for example increasing ideological differences or corruption of the delegate), the voter can simply revoke the delegation and either vote personally, or delegate someone else. As we will see later, exactly this notion of provisional trust is important to create a sense of responsibility and accountability for delegates."[xiv]

This notion of provisional trust is paramount to real use by citizens and large groups of consumers in vertical or domain ecosystems. Anonymization services are growing. Anon.ai, for example, is a startup anonymizing your data with AI. They are pre-funding, but have a proof of concept prototype. However, does anon.ai create any algorithmic transparency on how AI operates on data?[xv]

IDEO, Microsoft, IOTA is supporting Decentralized Identity Foundation (DIF) in building an open source decentralized identity ecosystem for people, organizations, apps, and devices."[xvi]

uPort is an open source software project to "establish a global, unified, sovereign identity system for people, businesses, organizations, devices, and bots."[xvii]

Accenture and Microsoft are creating a blockchain solution to support ID2020, a global public-private partnership dedicated to solving the challenges of identity faced by more than 1.1 billion people around the world. [xviii] How will DECODE interplay from the supply side with the GDPR framework?[xix] See for example the current Consent Management offerings from Magushi.io[xx].

We will address the issues raised above in an integrated way in the first Policy Meetup in Brussels, November 22, venue to be announced. In the policy workshop the following EU policy people will be invited

Andrea Servida[xxi], Head of Unit "eGovernment and Trust" at DG CONNECT, European Commission European Commission, DG CONNECT, Unit "eGovernment and Trust"

Susana Nascimento, Policy Analyst - Foresight, Behavioural Insights and Design for Policy, European Commission JRC, DLT: Upcoming activities of the EU Policy Lab.

Marloes Plomp presenting Blockchain Pilots:
https://www.blockchainpilots.nl/internationalepilots

DECODE has strong links with other stakeholders networks in the EC Research and Future Internet Community. Regular updates will be shared amongst other networks with the CAPS community mailing list and in particular with the CAPS coordination action CHIC that helps us assessing the outcomes of the project; the NGI Initiative (Next Generation Internet Initiative) and the IERC (The European Research Cluster on the Internet of Things). IERC has created several activity chains to favor close cooperation between the projects addressing IoT topics and to form an arena for exchange of ideas and open dialogue on important research challenges. Dyne leads *Activity Chain AC04 Hyper- connected Society*, Rob van Kranenburg (dyne, Council) Francesca Bria (IMI) and Martin Serrano (OpenIoT). Dissemination will happen also through the LinkedIn Group[xxii] and focus on, among others: oneM2M, AIOTI, and RRI Forum.[xxiii] Dyne chaired the Privacy section of Open IoT Assembly 2017[xxiv] that was gathering approximately 160 people to collaborate on creating a certification mark and set of principles for an open internet of things.

Section 4: Tested co-creation formats

The Meetups can draw on several co-creation formats. Based on prior EU research (SOCIOTAL, D-CENT), the practice of running meetups (in Ghent, Santander, and Novi Sad), Stakeholder Coordination in IoT-A.eu, FP7 Internet of Things Reference Architecture Flagship Project and Tagitsmart.eu, a Horizon 2020 project on smart QR codes, and hacker meetings and sprints we posit that co-creation must be seen in a holistic context, creating awareness on the one hand and conditions for adoption on the other.

We propose a granular approach regarding co-creation in use cases that ideally consists of four steps: mapping all relations and stakeholders in purposeful scenarios with a version of the co-create methodology of Nathalie Stembert, integrating all relevant activities including business development with the Urban Innovation Toolkit of Umbrellium, managing and arranging for friction through the one day meetup templates and through Giga Mapping assisting in the visualization of an ecosystem.

It is not required nor productive for every use case to go through all four steps. We want to test the full loop with one use case in Barcelona and one use case in Amsterdam. We describe the co-creation methodologies that will lead to case by case templates to be co-created with all stakeholders and end-users from the very beginning of asking the first questions as to why a specific tool should be introduced.

Format 1: Mapping

6 Using real maps and objects to build a scenario. Showing on the right the interface options (phone, tablet, computer)

The first step builds on the co-creation work that was done by members of Dyne in the context of the FP7 project SocIoTal. In *Making Onlife Principles into Actionable Guidelines for Smart City Frameworks and #IoT Policies* the authors describe how co-creation workshops and meetups addressed (i) lack of understanding by SME (Small and Medium Sized Companies) and City Councils, (ii) lack of third-party trust providers and (iii) lack of involvement of end-users in building use cases and developing new services.[xxv] The main differentiator with other co-creation methods is the toolkit that fronts pictures as the kick-starter of the discussion. By tailoring 3D printed objects that are specifically tuned to the local situation citizens can understand what kind of connectivity is in place, what kind of sensors are doing what and how the data from the sensors is related to a backend that can bring about new scenarios. There is no need to talk about sensors at all in the beginning, as it is about seeing (camera), hearing (microphone), speaking (feedback), counting (movement for example).

7 The co-creation tools in a workshop on air quality, system visualization and interfaces

SOCIOTAL was among the first in which part of the use cases were co-created with citizens without any experience in sensor related systems. It shows how crucial the start, context and each step in the process to get buy in and ownership from all stakeholders. Below the steps are outlined, taken from the co-creation workshop *Accessible routes in the city*, Santander 6 February 2015[xxvi]. They clearly show the steps that are needed to map a scenario with all stakeholders involved.

"Steps 1-3 ----- Interaction cards

The objective of these steps is to elicit rich insights about the barriers and challenges people encounter to define the content of the application.

The deck of interaction cards is totally focused on the appropriate context (in this case: Santander (pictures of the city) and possible architectural barriers (doors, stairs, etc.).

Participants are asked to select one picture with a positive aspect and one picture with a negative aspect (in this case in terms of accessibility)

Once the cards are selected they are presented to the other participants.

The participants choose three scenarios to discuss about and define one of these scenarios to elaborate on in step 4-5.
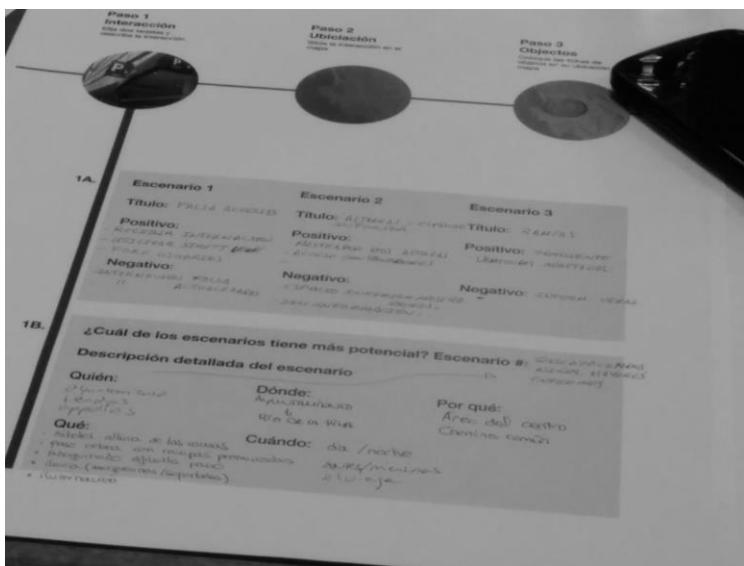
8 The selection of the Inspiration cards

Steps 4-5 ----- Tangible toolkit

The objective of these steps is to stimulate the participants to talk about smart objects in relation to a use case, in this case determining the optimal route through the city by means of smart objects.

Therefor objects related to the use case (i.e. crutches, wheelchair, ramps, obstacles) were on forehand added to the object tokens in the toolkit.

The participants then identify multiple stakeholders that are involved in the scenario."

9 A full scenario written out

Once the results from the Mapping are clear the next step is *The Urban Innovation* Toolkit[xxvii] Whereas the *Mapping* is mostly about the *who, integrate* is about the *why.*

Format 2: Integrate

DECODE will explore how to build a data-centric digital economy where data that is generated and gathered by citizens, the Internet of Things (IoT), and sensor networks is available for broader communal use, with appropriate privacy protections. The purpose of the Urban Innovation Toolkit and methodology is "therefore to make it easier to be rigorous in making sense of and defining a shared understanding of an urban technology project, particularly in terms of its problems, stakeholders, methods, evidence and impact."[xxviii]

Using the Toolkit provides a framework for a conversation around project development by concentrating on these five components (problems, stakeholders, methods, evidence, impact – because these are the core parts of a project that often miss deep consideration in project development processes since they seem obvious) and exploring how they are all interconnected.

The process focuses specifically on the 'tools for evidence', forcing a proposal to think from the point of view of end-users and other actors understanding their own needs in such a way that it matches the proposed offer as seamlessly as possible.

Dr. Mazlan Abbas, CEO of REDtone IoT, asks, in *Tips for City Authorities – How to Avoid Citizen Engagement Pitfalls*, "Many citizen engagement mobile apps (example – identifying pothole, drainage faulty traffic light, illegal parking, unattended, etc. issues) failed simply because it's unable to sustain the popularity, usage, and continuous enhancement. Why?"[xxix]

Mainly the answer is that the 'why' itself of the smart applications is not addressed.

That is why there are four main aspects to using the Toolkit:

"Use it to frame discussion around five core project concepts and create a common understanding between participants: problems, stakeholders, methods, evidence, impact

Use it to explore how these elements join up, or identify gaps (e.g. methods that don't have evidence, or stakeholders that are not involved in project development, or impact that cannot be evaluated)

Use it to discover Case Studies that are related to the project you are working on (matched by topic tags)

Use it to generate collateral that you can distribute to others:

Project Landscape diagram (that summarizes the content you have entered)
• Project Brief (text version of the same)
• Project mid-stream evaluation
• Final project evaluation
• Project Risk, Uncertainty & Complexity score"[xxx]

10 Example from the Toolkit

The Innovation Toolkit[xxxi] is not yet commercially available as it is a joint project of Umbrellium and Digital Catapult. In DECODE we can use the toolkit as part of further internal Umbrellium testing.

Format 3: Friction

In the coming period, we should build an ecosystem for entities that current stakeholders are not aware of how these will disrupt and/or enrich their services. As co-creation and co-design becomes more usual as building blocks in the process of engaging end-users it is becoming more professional, formal and data driven as well. This is what we strive for in *Mapping* and I*ntegrate*.

In this third step, 'Friction' we want to investigate this formal process. We work with elements from the game *le grand jeu* and *trasformatorio*, to problematize and question the relationship between citizens and the researchers/coders/investigators and bring out situations that can only be actualized by the performative aspects of the co-creation situation itself. We thus go beyond the notions of data entities but to *identity* itself.

The basic premise that guides the involvement of stakeholders, end-users, co-creation participants and the larger infrastructural, city, industrial and policy ecosystem in this template is a clear and productive design guideline:

Transformation is the welcomed rise of complexity (in any kind of process)

Trauma is the un-welcomed rise of complexity (in any kind of process)

Originating and tested in practice and participation of the *Trasformatorio* methodology this guideline explains and communicates the requirements for successful change, the positive attitude to invest in new and strange tools and eventually the success and real uptake of the DECODE enablers.

If new tools are not welcomed and complexity rises the mental models that generated them will not be effective, thus effectively grounding the situation in the old mental models provided by the very entities that is campaigned against.

"le Grand Jeu"[xxxii]

"le Grand Jeu"[xxxiii] is a working example of situation oriented analysis for sustainable micro-economies, through gamification and artistic methodologies. A table game allows to set a situation where concepts emerge from doing, players are by default considered as peers. Gamification techniques are intended "to leverage people's natural desires for socializing, learning, mastery, competition, achievement, status, self-expression, altruism, or closure, or simply their response to the framing of a situation as game or play. Early gamification strategies use rewards for players who accomplish desired tasks or competition to engage players."[xxxiv]

11 Action in le grand jeu

Trasformatorio

The Trasformatorio methodology can be resumed starting from its components:

- establish as soon as possible a core activity within all the partners and stakeholders using artistic methodologies and open game like strategies;
- lead to stories that helps transforming a situation with active action,
- evolve stories into a positive local narrative;
- catalyze processes of co-design and self-representation integrating art practices of various kind;
- allow (and curate) positive feedback cycles in both narrative space and design space.
- The most poignant elements that we will be 'performing' are

- Situations cannot be meaningful if isolated
- A situation is always in a place. The place is therefore an actor in the process
- A situation has a duration
- A situation has actors. No pure observer exists; a situation that is spied upon is a different situation from one that is not spied upon, no matter if those in the situation know or not about their observers.
- A useful situation is temporary

A situation is useful to our aims when there is a third force that determines its end: for a performance or a final presentation or a review

Transformation is the element that describes the welcomed rise of complexity in a creative process.

Transformation occurs when the rise of complexity is welcomed. This means there is agency. Trauma occurs when the rise of complexity is un-welcomed. This means there is no agency, only 'exposure'.

We address the reasons why new tools such as the DECODE enablers and tools can and will be broadly adopted. This will not happen by itself. Friction is inevitable. Rational arguments are in themselves not decisive:

What happens if we do not question the very notion of data that is put forward by IoT?

What is the difference in agency if people can entitle their sensor data and not add their own personal feelings, ideas and experiences as equally relevant?
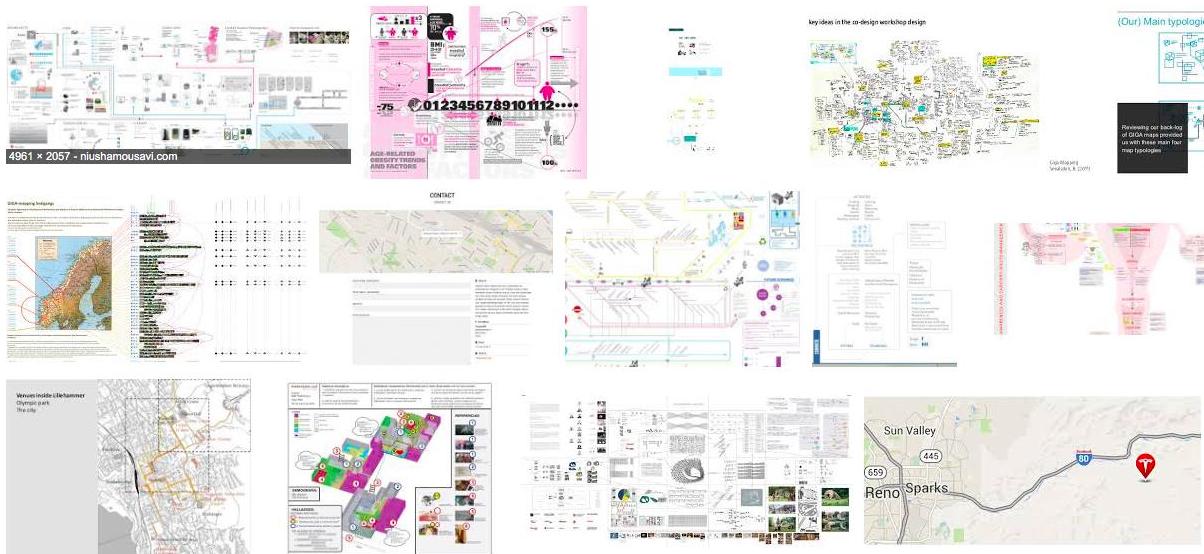
What happens if data can be reclaimed but neoliberal and datafied notions of the 'self' remain unchanged?

Can we foster notions of multiple ideas of self-accepting the insecurity and instability of any notion of 'stable' self?

Will notions of 'sharing' refer simply to 'goods' or to levels of transparency of individuals sharing 'feelings', 'spheres', hospitality?

Format 4: Giga Mapping

The fourth step is to orchestrate the methodologies, tools and appropriate research outcomes in a coherent and iterative way. The main instrument in the ecology orchestration of the relationships between the tools and the pilots will be a GIGA-map, a visual tool to help stakeholders understand complex subjects with large amount of data. GIGA-mapping is "super extensive mapping across multiple layers and scales, investigating relations between seemingly separated categories and so implementing boundary critique to the conception and framing of systems."[xxxv]

12 example og GIGA maps

Section 5: creating a shared vision through using collaborative tools is including internal stakeholders from the start.

DECODE believes that people should have a choice about what happens to their digital identity, who uses their data online, and for which purposes. One of DECODE's aims is to create local open and decentralized data platforms, where people can use data to guide meaningful decisions and actions. One key reason cities and municipalities have so far failed to foster local alternatives to dominant internet services such as Uber or Airbnb is that they lack access to data. Another reason is failing to introduce tools that have extreme usability and user experience, coupled with educational – but not patronizing – stories explaining why the public tools are better.

The premise of DECODE is that tools are not neutral. Rethinking what we mean by 'knowledge representation', constructing "new forms of 'flows' between content and context, and exploring the balance between the 'global' and the 'local'", requires a toolset that is able to allow new forms of 'flows' to emerge and codify them in a 'beta' way, so they can, be iterated upon. In *The Myth of Neutral Technology*, Jan Miller Polgar argues: "When technology is viewed as a tool, as something that is a necessary and integrated part of daily life, it becomes an enabler of activity. However, far too often, technology is a reminder that the user cannot participate in their community as they wish. Technology that is recommended without input from the consumer is in danger of being abandoned, at a cost to the user, their community, and society."[xxxvi]

In *Imagined Communities: Awareness, Information Sharing, and Privacy on the Facebook*, the authors find in 2006 that "an individual's privacy concerns are only a weak predictor of his membership to the network."[xxxvii] Eleven years later these parameters have not really changed as "most of respondents, who seem to be active users of Facebook, do disclose a considerable amount of private information of themselves, and contrary to their own belief, are not too well aware of the visibility of their information to people they do not necessarily know. Furthermore,

the privacy policy and terms of use of Facebook were largely not known or understood by our respondents."[xxxviii] In *The Effects of Perceived Functionality and Usability on Privacy and Security Concerns about Cloud Application Adoptions* Makoto Nakayama, Charlie Chen, Christopher Taylor find that improved usability perception eases both privacy and security concerns. They cite a survey in a past study showing that user experience affects trust (Beldad, de Jong, & Steehouder, 2010). Trust in turn lowers the degree of risk perception (Kim, Ferrin, & Rao, 2008): "That is, as Google Docs users continue to use the application, they develop more trust on Google Docs and, in turn, have lower risk perception. These are driven by the user learning through continuous interaction with the cloud application over time."[xxxix] This shows that educating users in the tools and language of the applications that pose the risk themselves will not lead in itself to a change in attitude or behavior, in fact it reinforces by the very nature of its familiarity the notion that it can be trusted.

This familiarity can only be broken *by bringing in new tools.* For this Dyne has brought tools into the project that were tested internally in the context of this deliverable. They are disrupting usability familiarity. Yet it is clear from the above that if the Consortium itself is not able to adopt these new toolsets it will not build the necessary skill and mind-set to convince other stakeholders and end-users to adopt the DECODE Hub and move away from the ease, convenience, familiarity and usability of successful Over the Top Players (OTT).

The tools provided by Dyne are:

Odoo is an open platform, evolved from open ERP that Dyne has adopted for project management and information sharing. The data is stored and automatically backed up on Dyne's servers.

[https://www.odoo.com/page/docs]

Owncloud: Last version of documents related to the project (Grant Agreemnt, Ammendment, Deliverables,…) are placed here for reference.

Gogs: gogs.dyne

A free and open source web-git platform adopted by Dyne for storing and co-creating data and software.

Secure pads: pad.dyne / calc.dyne

An in house secure platform to co-create test documents or spreadsheets. Used for collective note-taking during meetings.

Mailinglists

For communicating important updates to the entire consortium (general mailing-list) or a specific group (tech, or specific work-package)

VDC

For online stand-ups or regular meetings. Since the VDC is still unsuitable for a large group the proprietary service GoToMeeting for meetings larger than 10 attendants is used. We keep monitoring this solution to eventually migrate off proprietary services in the future. The software running server side to make conferencing available is Jitsi (https://jitsi.org)

Regular stand-ups

The partners involved in the tech and the partners involved in the inceptions are having (separately) weekly meetings to keep each other up to date of the tasks and discuss next steps. Each month therefore in GoToMeeting (until the VDC is fully applicable) there is a stand-up with representatives of all partners within the consortium. This helps to keep everybody up to date of the whole of the project, even when not directly connected to all tasks.

Markdown[xl]: is highly re-usable across all kind of platforms for essential text highlight and formatting.

The DECODEproject.eu site uses Google Analytics. The action points implicit in this analysis are:

1) install a piwik instance at dyne (likely on stubborn)

2) change dyne website and eventually other *dyne sites with piwik

3) contact DECODE and offer to use our piwik instance

Opsec (Operational Security) has been put in place to avoid unwanted leaking of information to third parties and corporate espionage.[xli] Not to use the tools as provided is a problem for reasons of data security, dispersion of documents in parallel versions, finding documents and co-creating documents.

The consortium is a community itself. The problems we have encountered in the first six months within the consortium in adjusting to secure tools will help us to think about the problems we will face when trying to get end-users to use DECODE. Conclusions from this process will be an addition to the ones developed in the pilots. Why did the consortium find it hard to start using them? That is the question we need to answer if we want to generate insight that helps us to persuade the outside world to adopt DECODE technology. We have chosen the *trasformatorio template* as the enabler to enhance and facilitate the friction experienced in the Consortium. The results will lead to a further iteration of the template. Two weeks before the GA the template will be send. As change management and nudging end-users into more granular ways of approaching identity management (making easy things more complex) the same kind of incentives could apply to partners themselves who – understandably – long to keep working tools which they are used to. From habit these platforms seem easier to use but the size of the

consortium makes it harder to break the habit. We adapt ourselves as well and design our approach in a more efficient way both for end-users as well as for ourselves internally.

Conclusion

In *Key Elements and Enablers for Developing an IoT Ecosystem*, Omar Valdez-de-Leon concludes that ecosystem will ultimately be the competitive unit in the digital transition. Building an IoT ecosystem, according to him "is a complex undertaking that requires many interconnected factors to be balanced. The challenge for businesses is to establish an IoT ecosystem strategy that is holistic, considering all the elements described above and adopt an ecosystem mindset that moves away from vertical value chains with one set of customers at the end of it." [xlii].

To those who says that a 2 billion user network cannot be 'defeated' we can only point to the slow and purposeful growth of, for example, Facebook itself. Other networks were existing before Facebook launched in 2004. Club Nexus was too complex. Friendster became too slow as it failed to match the back end to the demand. Marc Zuckerberg learned from this and controlled new registrations carefully to be always 'working', building the backend faster than the data flows. He thus added one school at a time.[xliii]

It is quite possible that blockchain and crypto currencies enable a situation in which DECODE can add one neighborhood at the time. Creating and tracking identity, recording contracts, reputation management, distributed consensus and secure channel communication are powerful tools once solely in the hands of mega corporations and states. Toby Considine relates why blockchain in logistics is so in demand. He notes that it is now possible to locally track disconnected events "without multiple expensive data connections [to the middle of the Pacific]. All concerned parties could use the CC database when they get to shore, each trusting that the database was not changed because of the immutable consensus."[xliv]

Citizen-centric approaches to the Smart City still lack enough real added value for citizens. DECODE claims that the key to a successful smart city is having shared access to the highest level of granularity of the data within all the networks: wearables (Body Area Network or BAN), home (Local Area Network or LAN), connected transport (Wide Area Network or WAN) and smart city (Very Wide Area Network or VWAN).

If we think of these networks (BAN, LAN, WAN, VWAN) as seas and the points where citizens make actual connections as shores then it is quite reasonable in the current climate of full distrust that DECODE and solutions like it will be able to benefit, grow and become sustainable.

DECODE thus provides tools that put individuals in control of whether they keep their personal data private or share it for the public good. These tools are tested in four pilots. Recent work in Digital Social Innovation has shown that through co-creation shared meaning and shared context arises to leads to faster and more mature, sustainable, adoption of the tools.[xlv] Rational arguments and ideological explanations alone will not change behavior as the internal experiences in the consortium towards the use of new tool show. Users need to see real value, developers need to see viable business cases and policy makers need to see sustainable building

blocks that are as effective as the current commercial offerings. Co-creation is thus becoming more of an attitude, a way of working without which stakeholder coordination on all levels (users, developers, policy) cannot be build, and ecosystems cannot be managed.

i   "To explore how everyday life can be supported and enhanced through the use of collections of interacting artefacts. Together, these artefacts will form new people-friendly environments in which the computer-as-we-know-it has no role. The aim is to arrive at new concepts and techniques out of which future applications can be developed." The Disappearing Computer Proactive Initiative in FP5 (1998-2002)

ii   http://cordis.europa.eu/project/rcn/67029_en.html

iii   Cited in Designing, Developing, and Facilitating Smart Cities: Urban Design to IoT Solutions, by Vangelis Angelakis, Elias Tragos, Henrich C. Pöhls, Adam Kapovits, Alessandro Bassi Springer, 06 Jan 2017 - Technology & Engineering - 336 pages, p 34

iv   http://cordis.europa.eu/news/rcn/12167_en.html

v   ¥   ""USEFUL ...listening to and developing technology for ordinary people sums up what we might refer to as Co-Creative design. Involving the end user in a core and proactive manner at all stages in the product or system creation process.

¥   RELEVANT ...listening to and developing technology for ordinary people is so relevant because the 'ordinary...ness' is the issue. Much of what we concentrated on in Living Memory was the means by which people interact with each other (the technology) and the interfaces to that technology, which we offer.

¥   IMPORTANT ...listening to and developing technology for ordinary people. The world of stuff is not enough... the design discipline is changing fast. Design must now respond to an economic model which supports the provision of converged and connected solutions, such as LIME, combining products and services to suit individual needs.

¥   SUCCESSFUL ...listening to and developing technology for ordinary people. The extent to which the project was successful is the subject of the complete review and validation process, which we conducted. Design is often seen as an applied discipline, where fine art may be regarded as the pure discipline. We believe that this is not the case and that it is possible to: research the 'pure' Design discipline in order to develop its future role in differing contexts; to use Design as a research tool to help us better understand and contribute to the changing nature of People, Culture and Society and in turn assist in the integration of emerging and future technologies into the lives of 'ordinary people'; to find more effective tools and research areas for Design to consult and investigate in order to provide more holistic and relevant propositions within our commercial practice.

¥   INSPIRATIONAL.... listening to and developing technology for ordinary people. Certainly, in all the ways mentioned above...inspired us to find NEW KNOWLEDGE: NEW ROLES FOR DESIGN: ways to integrate SYNTHETICAL and ANALYTICAL research: NEW IP: seeds for NEW OPEN PRODUCTS-SYSTEMS-SERVICES...

¥   DIFFERENT ... Research is by definition, DIFFERENT, especially when it is this trans disciplinary, collaborative, human focused, artistic and scientific driven end results in such enriched experiences for people... "

vi Nokia have begun implementing a number of smart city initiatives across the world. In the Tianfu New Area Chengdu Administrative Committee and Nokia have signed a strategic agreement (MoU) regarding digital city development.Under the agreement, both parties will collaborate on the establishment of the new digital city including the construction of the data centre and related telecom infrastructure, the deployment of the trial network for internet of things (IoT), the incubation of IoT applications and devices, big data, and the deployment of an end-to-end optics network in Tianfu New Area. Mr. Luo Qiang, Mayor of Chengdu, attended the ceremony and witnessed the signing.

http://www.information-age.com/global-smart-city-drive-gaining-traction-123467250/

vii   http://www.alphr.com/technology/1006261/how-one-european-smart-city-is-giving-power-back-to-its-citizens

viii Conversation with Ger Baron CTO AMS, Manon den Dunnen, Innovation Police NL Futurelab Vondelpark, Rob van Kranenburg and Jennifer Veldman (Dyne)

One of the first 'communities' that was approached was the City of Amsterdam. The cooperation with both the city of Amsterdam and the City of Barcelona as two leading smart Cities makes a very strong case for DECODE.

Ger feels that there is room to move new organizational principles in the ways of working of the City. Within the units a new organizational structure is set up, a new entity, a Foundation that should act as the new face of public digital agency. This new entity will also operate in a new legal landscape; alliances, waternet, police, fire brigade, in short a number of city services will form this new entity.

The keyword is Urgency: people inside organization really feel the move from mainframe (Oracle, SAP) to the Cloud. Now is the time to change organizational principles, as well as providers. Validate what needs to be validated. Vision on data means that citizens are able to push their credentials and tokens to services.

We need Actionable & Concrete Focus on workplace (operational activities) and concrete interactions with the citizen. Currently there is no incentive for city services to be honest about their security status; schools get hacked for "grade management". Although datasets are known, during incidents (fire) data on residents cannot be shared with all parties. To break open concepts like privacy and security into *privacies and securities*. According to Ger Baron privacies are *levels of accountability and rights*.

ix https://Fairbnb.coop

x https://amsterdamsmartcity.com/projects/gebiedonline-q401tgsl

xi   https://www.upf.edu/web/mdm-dtic/projects/-/asset_publisher/Ef1was9TxNY4/content/id/4112155#.WUvWjB-YH7c

xii Caduff et al. (2010) io: Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth. This report was written by Simona Cavallini, Rossella Soldi, Julia Friedl, Margherita Volpe (consortium Progress Consulting S.r.l. & Fondazione FORMIT).

xiii "Cloud Computing, is defined as a group of computers and servers connected together over the Internet to form a network. Today, as many enterprises and large organisations are beginning to adopt the Internet of Things, the need for large amounts of data to be accessed more quickly, and locally, is ever-growing. This is where the concept of "Fog Computing" comes to play.

Fog Computing, or "fogging", is a distributed infrastructure in which certain application processes or services are managed at the edge of the network by a smart device, but others are still managed in the cloud. It is, essentially, a middle layer between the cloud and the hardware to enable more efficient data processing, analysis and storage, which is achieved by reducing the amount of data which needs to be transported to the cloud."

https://www.westbaseuk.com/news/fog-computing-vs-cloud-computing-whats-the-difference/

xiv Working on Blockchain, eGovernance and Collective Intelligence

https://medium.com/organizer-sandbox/liquid-democracy-true-democracy-for-the-21st-century-7c66f5e53b6f

xv Discussion on Council List.

 IoT@lists.dyne
https://mailinglists.dyne/cgi-bin/mailman/listinfo/iot

xvi https://decentralized-identity.github.io

xvii https://www.uport.me

xviii http://id2020.org

xix The EU General Data Protection Regulation (GDPR) replaces the Data Protection Directive 95/46/EC and was designed to harmonize data privacy laws across Europe, to protect and empower all EU citizens data privacy and to reshape the way organizations across the region approach data privacy. The key articles of the GDPR, as well as information on its business impact, can be found throughout this site. http://www.eugdpr.org

xx Our dashboard uses "privacy by design" modelling of data and of the operations carried out with it, making it possible to quickly visualize the entire process. Our processing tools include blurring and anonymization features, available at different degrees to best serve users. With our data model, user data can be separated from a user's identity to prevent reidentification.

http://magush.io/en/page-principale/produits/tableau-de-bord-gdpr/

xxi All speakers are confirmed.

xxii   https://www.linkedin.com/groups/13530087

xxiii   http://www.onem2m.org
https://aioti-space.org
https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

xxiv   #iotmark
https://join.slack.com/iotmark/shared_invite/MjAwNjE1NDEwODA0LTE0OTc5NjgyMjgtNWQ5MTAzNjg1NQ
iotmark.org
https://docs.google.com/document/d/1b_0Wz6pEM8282t8H4MMfBpfCBkxwNGYR1enJOTuolJ4/edit?usp=sharing

xxv   Nenad Gilgoric, Christine Hennebert, Srdjan Krco, Carmen Lopez, Ignacio Maestro, Colin Ő Reilly, Michele Nati, Antonio Skarmeta, Rob van Kranenburg , Nathalie Stembert, Alberto Serra. Making Onlife Principles into Actionable Guidelines for Smart City Frameworks and #IoT Policies. Designing, Developing, and Facilitating Smart Cities pp 33-48 06 December 2016

Activity	Description	Start	Duration
Arrival and welcome	*Awaiting all the participants to arrive.*	*9:00*	*15 min*
Introduction	Short introduction of the organizers, facilitator and all the participants.	9:15	15 min
Step 1 - 3 Interaction cards	Defining scenarios (use cases) by means of the interaction cards and elaborate on the selected scenario.	9:30	30 min
Break	*Small break*	*10:00*	*15 min*
Step 4 - 5 Tangible toolkit	Building the selected scenario by placing /connecting (smart) objects and their sensors on the city map.	10:15	30 min
Step 6a Interfaces	Visualizing the interfaces of the app.	10:45	15 min
Break	*Small break*	*11:00*	*15 min*
Step 6b Business models and conclusion	Tinkering about potential business model opportunities and concluding on the workshop output.	11:15	30 min
Wrap-up	Thanking the participants for their input.	11:45	5 min

| **Total**** | **Including 10 minutes for possible extension of activities if needed. | | **3 hours** |

Table 1 – Workshop schedule

xxvii Urban Innovation Toolkit

For more information contact info@umbrellium.co.uk

xxviii   http://umbrellium.co.uk/initiatives/urban-innovation-toolkit/

xxix   Dr. Mazlan Abbas : Tips for City Authorities – How to Avoid Citizen Engagement Pitfalls. In: IOT Talk Series (Part-6) – Making Sense of Data – But What Data? Posted on August 1, 2016, by IOT World

xxx Description provided by Umbrellium; http://umbrellium.co.uk/initiatives/urban-innovation-toolkit/

xxxi http://umbrellium.co.uk/initiatives/urban-innovation-toolkit/ Contact usman@umbrellium.co.uk

xxxii   "Le Grand Jeu" (www.legrandjeu.net) is the name of a game designed in May-July 2016 by Federico Bonelli and Raffaella Rovida, and that finalised in a 4 days workshop held in Milan 10-14 July 2016 and perfectioned in another 2 iterations in Venice and presented last 11 of May in SALE Doks for Darkmattergames, a side event of Biennale 2017. The group of players includes artists, engineers, experts of design and planning, citizens and activists. The idea and the direction of the process came by to help design a situation where some narratives about the future of our society could be told, crafted and eventually discussed in a positive way. It is copyright with creative commons non-commercial sharealike 4.0 international.

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xxxiv https://en.wikipedia.org/wiki/Gamification

xxxv   Sevaldson, B. GIGA-Mapping: Visualisation for complexity and systems thinking in design. Nordic Design Research Conference 2011 Helsinki www.nordes.org http://www.nordes.org/opj/index.php/n13/article/view/104/88

xxxvi Jan Miller Polgar, The Myth of Neutral Technology. In M.M.K. Oishi et al. (eds.), Design and Use of Assistive Technology: Social, 17 Technical, Ethical, and Economic Challenges, DOI 10.1007/978-1-4419-7031-2 2, c Springer Science+Business Media, LLC 2010

xxxvii   Acquisti A., Gross R. (2006) Imagined Communities: Awareness, Information Sharing, and Privacy on the Facebook. In: Danezis G., Golle P. (eds) Privacy Enhancing Technologies. PET 2006. Lecture Notes in Computer Science, vol 4258. Springer, Berlin, Heidelberg.

http://www.heinz.cmu.edu/~acquisti/papers/acquisti-gross-facebook-privacy-PET-final.pdf

xxxviii   Virpi Kristiina Tuunainen, Olli Pitkänen and Marjaana Hovi In Users' Awareness of Privacy on Online Social Networking Sites – Case Facebook. Telematics and Informatics. Volume 34, Issue 1, February 2017, Pages 412–424

http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1000&context=bled2009

xxxix   http://jisar.org/2017-10/n2/JISARv10n2.pdf#page=4

xl https://guides.github.com/features/mastering-markdown/

xli   *references and useful links*
- Best multiplatform Password Manager http://thehackernews.com/2016/07/best-password-manager.html

- The GNU Privacy Guard GnuPG is a complete and free implementation of the OpenPGP standard as defined by RFC4880 (also known as PGP). https://gnupg.org
- Internal communication and engagement toolkit
- Once secure email communication is established the toolkit can be introduced.
- ERP: DECODE.dyne, Odoo.

xlii Key Elements and Enablers for Developing an IoT Ecosystem, by Omar Valdez-de-Leon. May 17, 2017 IEEE Internet of Things

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xliii http://www.businessinsider.com/secrets-to-facebooks-success-2012-5?IR=T#4-figure-out-what-will-kill-you-and-make-sure-it-doesnt-4

xliv exchange on the Council list.

xlv Co-creation workshops across 5 cities, by Hannah Rich, Young Foundation

It was crucial for the host centres to engage with key actors in order to develop meaningful and sustainable solutions, including the wider social innovation community, local stakeholder and unusual suspects – across the 5 centres, these included public employees, civil servants, young professionals, private businesses and refugees, all with varying degrees of familiarity with the world of social innovation.

https://www.siceurope.eu/network/intermediaries/co-creation-workshops-across-5-cities