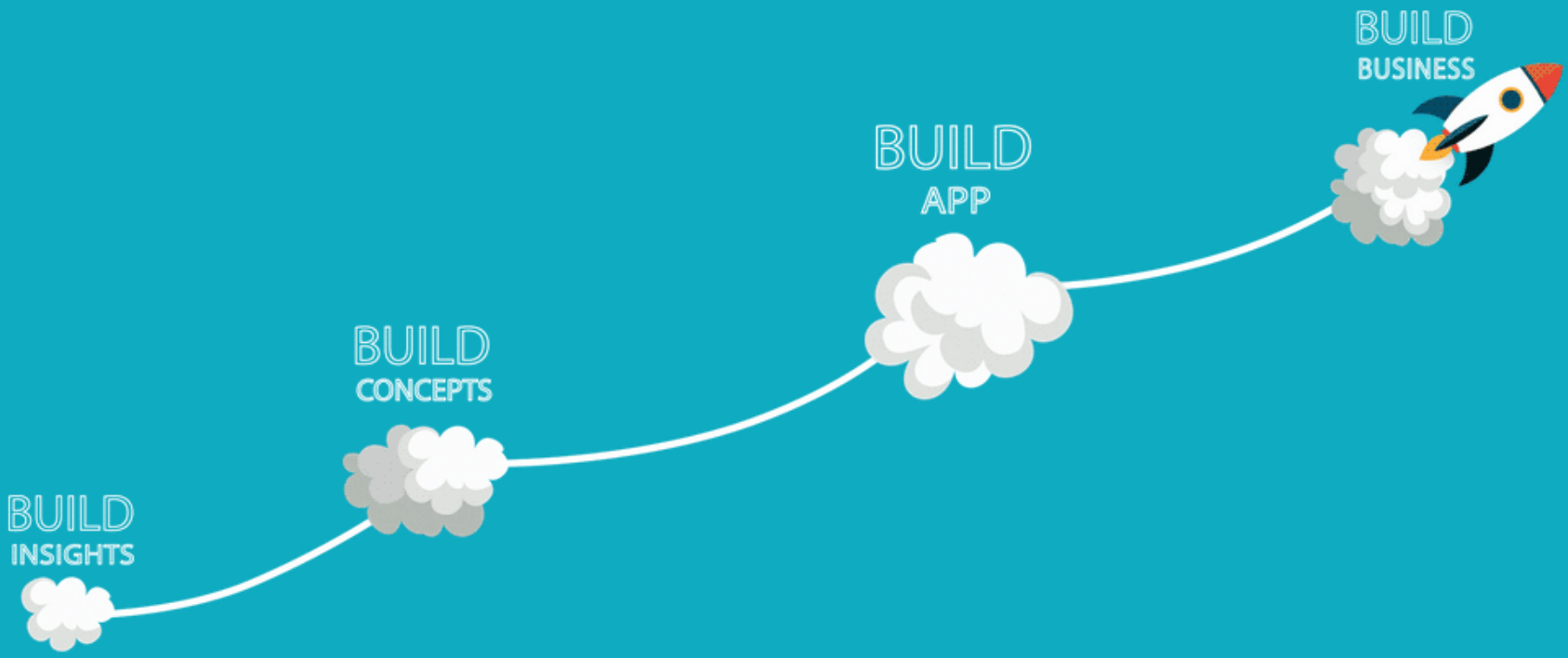
IT TOOLS FOR CO-DESIGN

DEVELOPMENT OF THE OPEN DATA LAB PLATFORM TO SUPPORT CO-DESIGN PROCESSES

PROCESS REPORT

MASTER THESIS BY MARIEL WALKIRIA BACKMAN | 20152043



Acknowledgement

Many thanks to

- **Open4Citizens** for their collaboration and feedback on this thesis

  Copenhagen Pilot
  - Janice Pedersen, Antropologerne
  - Amalia de Götzen, Aalborg University
  - Nicola Morelli, Aalborg University
  - Louise Klitgaard Torntoft, Aalborg University
  - Anne Sophie Juul Sørensen, Dataproces
  - Mehdi Ben Taarit, Dataproces

  Rotterdam Pilot
  - Péter Kun, TU Delft

- **My classmates and alumni from the Service Systems Design Master,** for being my sparring partners and for their help and patience whenever I got stuck

- **My friends, family, co-workers at Gramex, and everyone who supported me** in any and every way in this process. You know who you are - *ingen nämnd och ingen glömd!*

Glossary

Co-design: an activity where different kinds of people, such as researchers, designers, coders, public authorities, citizens, and users, who are “experts of their experiences”, come together to cooperate creatively (Steen, Manschot, & De Koning, 2011).

In the context of this thesis, co-design processes will refer to events such as hackathons, design jams, workshops and/or other kinds of events where people build interdisciplinary groups to work on an idea or a challenge. However, the word “hackathon” is the one most frequently used in this thesis.

Data: a value assigned to a thing, that when interpreted creates information (Open4Citizens, 2016a).

Open data: The Open Data Institute defines open data as data that anyone can access, use and share (Open Data Institute, 2017). In addition, the Open Data Handbook states that open data is data that can be freely used, reused and redistributed by anyone, available in a convenient and editable format, preferably by downloading it over the internet (Open Data Handbook, 2017).

Service: something that helps a user or customer to do something (Downe, 2016).

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Introduction

- Introduction to the thesis
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Introduction

Data is an important component in many services and applications today. When interacting with these services and applications, we generate data, which is then transformed. For example, the information we share on our preferred social media could be used for targeted ads; an online shop makes suggestions based on goods we have previously purchased; a fitness app uses the data from previously tracked runs to show us how we have improved over time; a music service recommends new artists and tracks similar to what we have listened to before. Websites collect information about our preferences, where we click, how long we read, etc. - in order to customize their content and offer us a personalized experience.

Within the universe of data, one kind is of particular interest in many countries (Open Knowledge Foundation, n.d.b): open data. Most of us have, at some point in our lives, used a service based on open data. One example is the travel planner we access when we need to know the location and timetable of the bus or the train closest to our place of residence or work. Open data, which is data that can be freely used, reused and redistributed, is here to stay.

The Open Knowledge Foundation (OKFN) states that open data "is a tremendous resource that is yet to be untapped", with many areas where it can be of value not only for governments but also for citizens (Open Knowledge Foundation, 2017).

For the public sector it creates transparency, as citizens could easily access available datasets and gain knowledge of what the government is doing and therefore be able to take better informed decisions. For citizens it could be the raw material for the creation of innovative services that can make their lives easier (Carrara & Tinholt, 2016).

Open data is particularly valuable in smart cities, and has so far been used mostly in the areas of infrastructure and technology, according to The Open Data Institute in their blog post "A smart city is an open city" (Open Data Institute, n.d.). In this post they imply that citizens have a rather passive role in the movement, in which they are not being seen as a resource and missing out on sharing their input for the development of the cities they live in. Boyd Cohen, in his article "What Exactly is a Smart City" (Cohen, 2012), advocates including citizens as part of the smart cities vision. He, too, sees citizen engagement as a missing ingredient of sorts in the smart city agenda.

One other factor observed in talking to many people about the topic of this thesis in informal situations is that there is a general perception of open data as something difficult to grasp or "something for 'techies'". Thus, a need has been seen, in which providing knowledge about open data and ways to play with data could bring awareness of how powerful our role in society could be if we learned to identify opportunities with the data that is being created. Usually those statements are followed by these 2 examples below, in addition to those explained at the beginning.

A fairly new take on the classic train timetable application was implemented by a software developer at a bar close to Linköping Station in Sweden. The application, which uses open data produced by the Swedish Transport Administration, shows in a big screen not only the train departure information (time, platform and possible delays and/or cancellations, if any), but also if it is time to board the train or if there is time to enjoy a small or large beer (Alvin, 2016).

A citizen's problem with incontinence and with not being able to find a list of public toilets while in the city led her to create the FindToilet[1] app, which uses open data to show

1 http://www.findtoilet.dk/

on a map where the closest public toilets are. Her project also opens up for municipalities to upload their own dataset on location of facilities, so her app showcases the most up-to-date information.

The train timetable/beer service and FindToilet are examples of how citizens with an idea or a need to be met can take advantage of all the possibilities that open data brings, while acquiring new knowledge and skills. However, to get from the initial idea to the identification of the needed information, the creation of the dataset and eventually to the creation of a service there is a know-how gap that needs to be reduced. This is something that the European project Open4Citizens is keen to address, by providing tools that will enable citizens to learn about and unlock the potential of open data and use it to create open data-based services that fit their needs. One of these tools is the digital platform Open Data Lab Platform, which was specifically created "to help its users build an understanding of what open data is" (Open4Citizens, 2016a).

This thesis represents the continuation of the work done as an intern for O4C's Copenhagen Pilot, which laid the foundation of the analysis carried out for this project, as well as the application in a case of the knowledge acquired throughout the studies at the Master in Service Systems Design. The case is to investigate how service design can be applied to the development of the Open Data Lab Platform, so that it can be used in both co-design contexts and for independent purposes outside of the framework of a co-design event.

Learning Goals

Official Learning Goals

The study curriculum states the following goals to be reached.

Knowledge

- Must have knowledge about the possibilities to apply appropriate methodological approaches to specific study areas
- Must have knowledge about design theories and methods that focus on the design of advanced and complex product-service systems

Skills

- Must be able to work independently, to identify major problem areas (analysis) and adequately address problems and opportunities (synthesis)
- Must demonstrate the capability of analysing, designing and representing innovative solutions
- Must demonstrate the ability to evaluate and address (synthesis) major organisational and business issues emerging in the design of a product-service system

Competences

- Must be able to master design and development work in situations that are complex, unpredictable and require new solutions (synthesis)
- Must be able to independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility (synthesis)
- Must have the capability to independently take responsibility for own professional development and specialisation (synthesis)

Personal Learning Goals

Besides the official goals, I set the following goals for myself.

- To apply service design knowledge to a business case and to complete a design process individually
- To make good use of my background as a front-end developer and my interest in research and analysis in a service design context

Methodology

The chosen methodology for this thesis is the Double Diamond. It is a framework that is structured and gives a clear overview of the different stages to follow in a simple manner, while also allowing for some flexibility should it be tailored to suit the needs of the project it will be applied to (Stickdorn & Schneider, 2015, pp. 124-135).

In this project, a pre-project stage was added, where information about the project context was given. From here a use case was chosen and details about the local context are provided. Following this stage, an initial problem statement was made to steer the focus of the thesis. The Double Diamond was then tailored to allow for iterations between the Discover and Define stages.

To track the process over time, the Kanban chart was chosen, given its quality to provide a quick overview of the tasks and the phase they are in (LeanKit, 2017). At Scrumy.com, which provides a scaled down online Kanban chart, a chart called “Mariel’s thesis”[2] was created. As time went by, tasks were added, thus the chart was updated often to reflect this. Please refer to Appendix 5 to see the changes throughout the project.

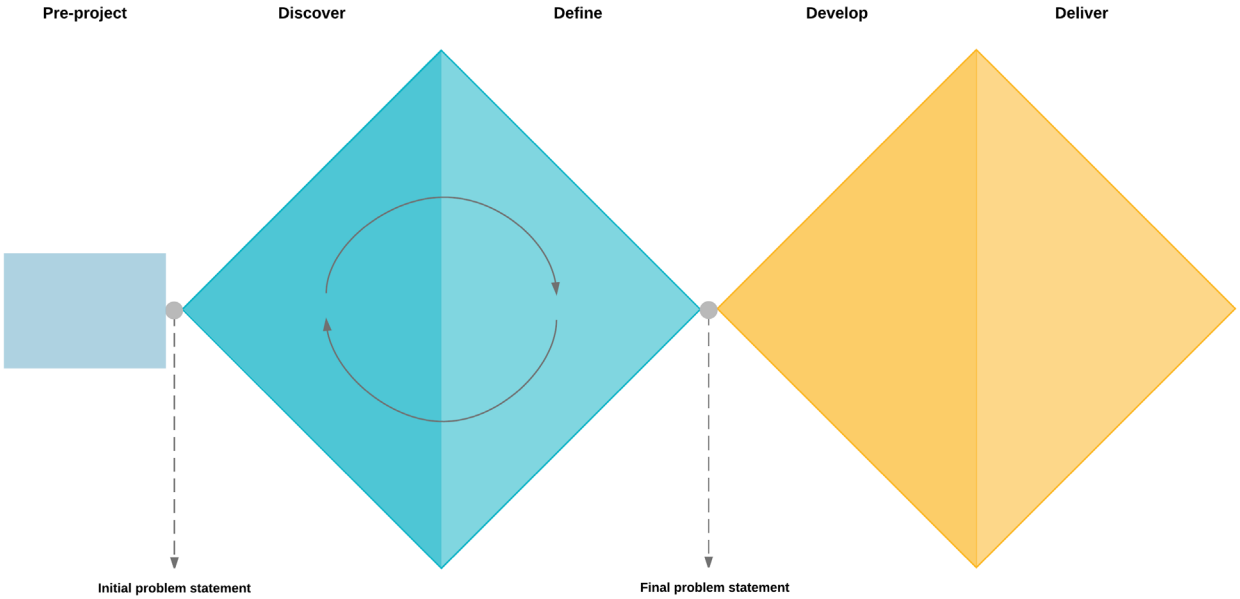


Fig 1. The Double Diamond applied to this thesis.

2 http://scrumy.com/marielsthesis

Pre-Project: Project Context

This chapter is written from documents of public domain, some internal documents and professional experience as an intern for Open4Citizens.

What is Open4Citizens?

Open4Citizens (O4C) is a 30-month European-funded project that aims to empower citizens to make meaningful use of open data[3] and to reduce the gap between the opportunities that open data present and the citizens' capability to make meaningful use of it. It involves citizens into a co-design process, hereby referred to as hackathons, for the duration of the project, together with experts from various areas: IT, public authorities, startups, designers, etc. to develop new services to improve aspects within their everyday life.

During the project there will be 2 rounds of hackathons. The first round of hackathons happened in 2016 and the second round will take place in the fall of 2017.

After the project is finished, an Open Data Lab (ODL) will be created physically or virtually, which will become a reference for anyone with an interest to propose innovative open data-based applications or services.

The Pilots

The project is composed of 5 pilots (Fig. 2), who for the hackathons that took place in 2016 have chosen to address needs they have identified locally within this overall theme (Open4Citizens, 2016b):

- **Milan (MIL):** transparency during urban renovation processes
- **Copenhagen (CPH):** integration
- **Rotterdam (RTM):** urban services for public parks
- **Barcelona (BCN):** urban public health, improvement of neighborhood services and better access to local culture
- **Karlstad (KSD):** health

The O4C consortium is formed by 8 partners throughout the 5 pilots, as shown on Fig. 3.

Fig. 2 (left). Icons that represent O4C's 5 pilots.
Fig. 3 (right). The consortium.

3 http://open4citizens.eu/

The Hackathon Process and the Hackathon Starter Kit

The hackathon process that O4C designed for the hackathons they conduct consists of 3 phases (Fig. 4).

- **Pre-Hack:** where the pilots identify challenges, datasets, and possible stakeholders within their chosen theme; this is also the stage where participants can register to the hackathon
- **Hackathon:** this is the event where teams take on the proposed challenges and come together to find solutions to them
- **Post-Hack:** this is the stage where the pilots can provide support to the concepts created during the hackathon phase. This could be activities related to getting funding or finding other potential stakeholders to turn the concepts into services

From this hackathon process, it is desired to raise the knowledge of open data among the citizens, create specific open data driven solutions to everyday problems considering the citizens' and other stakeholders' needs, and to establish a community of citizens who can create their own hackathons and collaborate on the creation of solutions to benefit the society.

The Hackathon Starter Kit (HSK) is a collection of 9 tools created specifically for

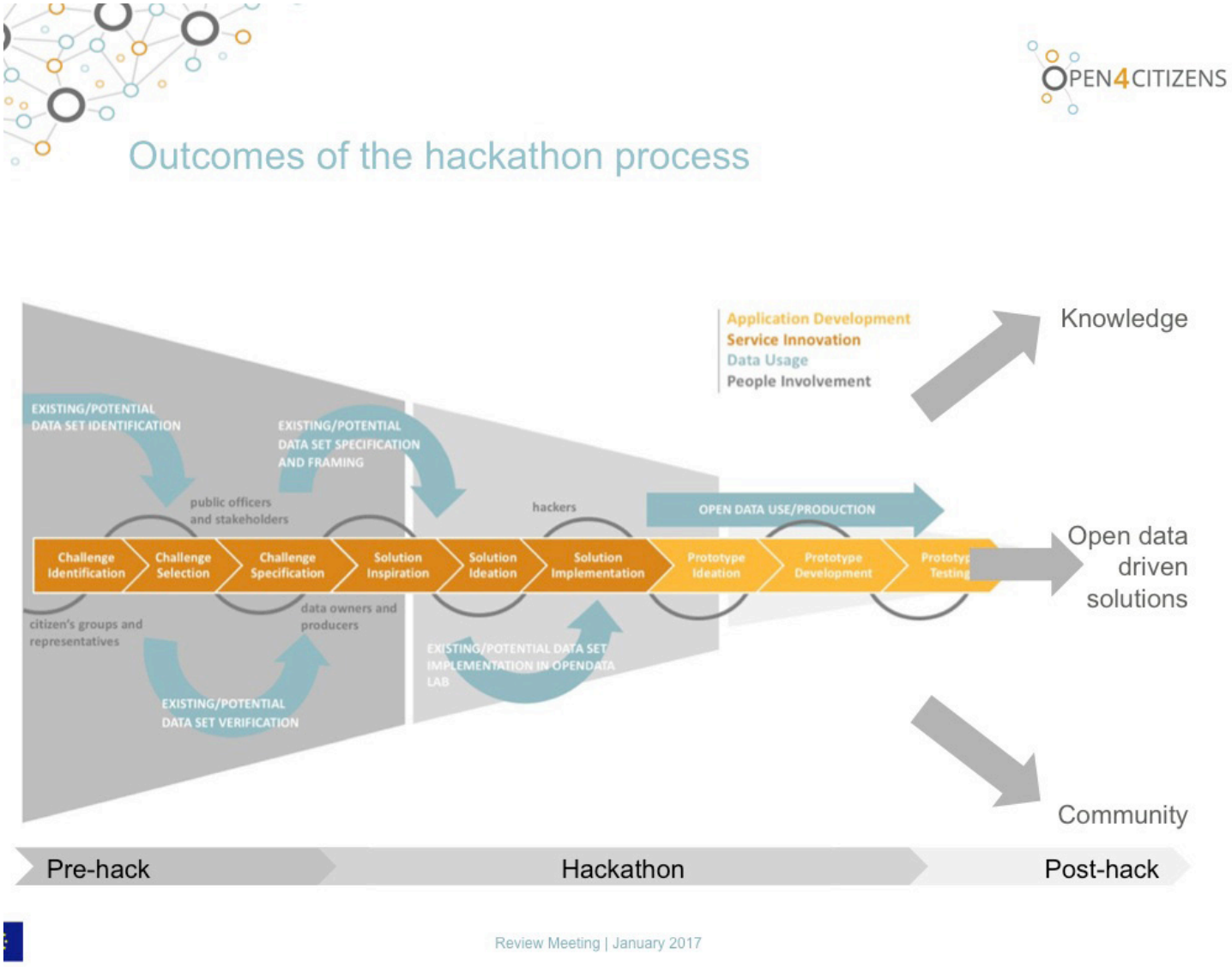


Fig. 4. The hackathon process and its outcomes.

this project. It is primarily intended to lower the entry barrier for participants in hackathons, thus enabling any citizen to take part. Additionally, it can provide a standardized approach to hackathon activities across the pilots (Open4Citizens, 2016c, p. 6). The tools forming the HSK are:

- Open Data Introduction
- Inspiration Cards
- Preliminary Need Definition Card
- Need Definition Tool
- Concept Definition Tool
- Data Validation Tool
- Open Data Lab Platform
- Scenario Tool
- Prototype Planning Tool
- Pitching Tool

What is the Open Data Lab Platform?

The Open Data Lab (ODL) Platform (Fig. 5) is a tool that enables any citizen to explore the possibilities of open data and understand its full potential. It is conceptualized to be used by tech-savvy citizens and non tech-savvy citizens alike, providing both groups tools and guidance to raise their data literacy, build concepts and start building prototypes of services. It is the vision of O4C that the Platform will live on after the project is finished, as part of the offerings of the Open Data Lab initiatives.

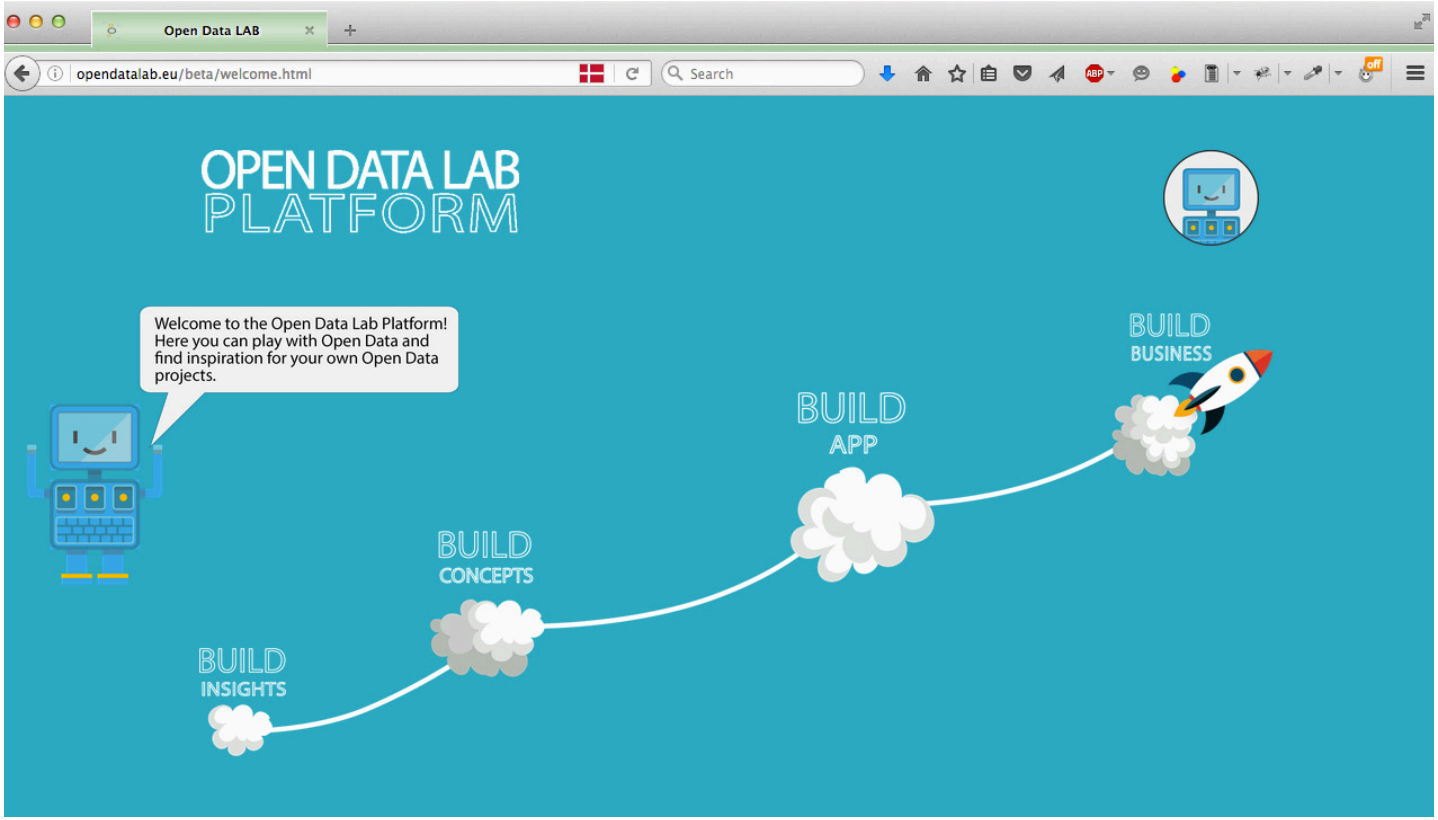


Fig. 5. The ODL Platform as of the writing of this thesis.

First Round of Hackathons

The HSK was designed to provide tools to support the hackathons. It refers to a combination of paper tools and the ODL Platform, which will be subjected to an iterative design process that will lead to the development of a Citizen Data Toolkit when the O4C project is finished (Open4Citizens, 2016c, p. 14).

The Kit comprises tools for inspiration, ideation and implementation, which were the hackathon activities identified when it was being designed (Open4Citizens, 2016c, p. 15), as explained in Fig. 6.

The HSK provides a unified hackathon process across the pilots, which could allow the different information and results to be compared once every country has held their event, but it also left some flexibility to tailor the tools according to the local needs.

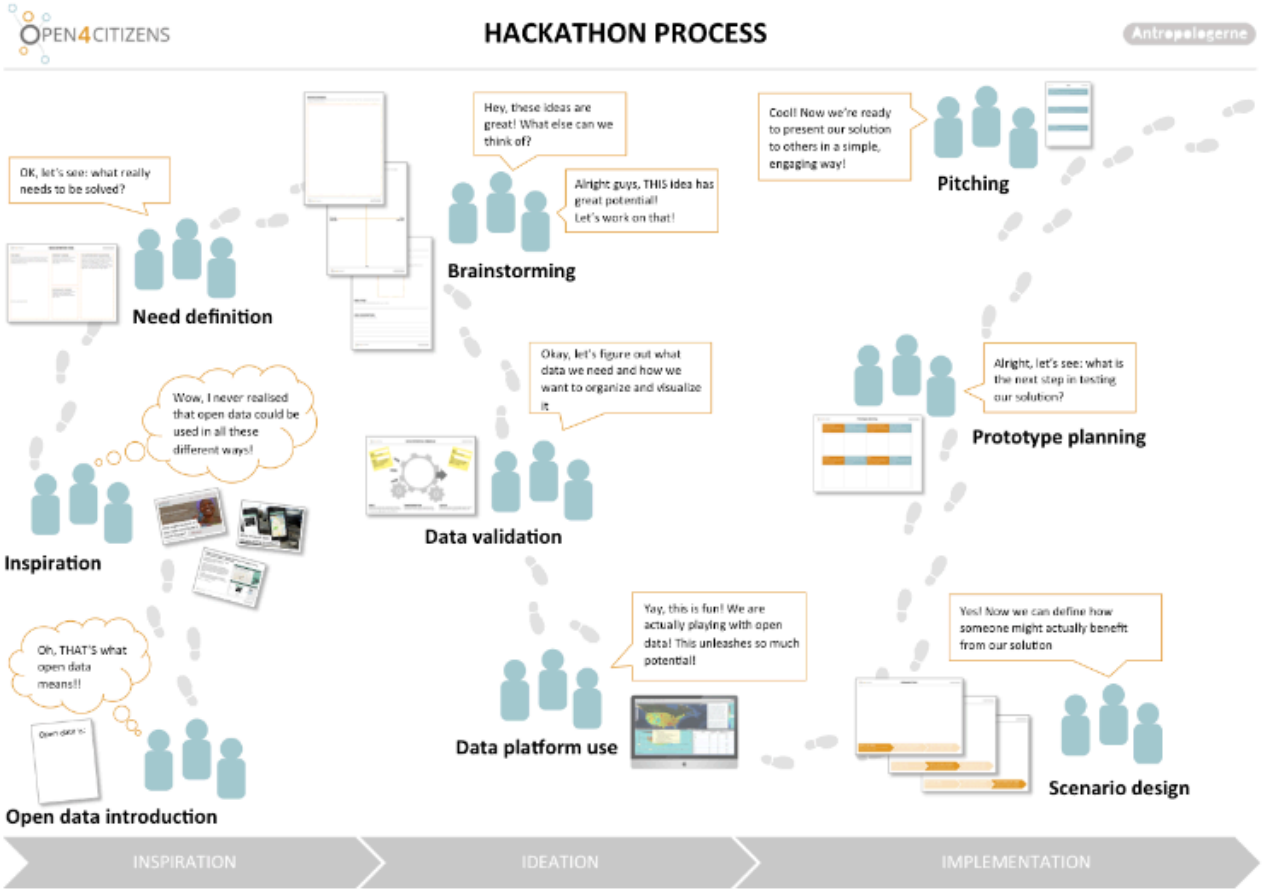


Fig. 6. The HSK shown in the hackathon (event) process, as designed by Antropologerne.

Based upon reading internal post-hackathon reports[4], it is understood that each pilot had context-specific factors, such as availability of data relevant to their themes, presence of data owners, the backgrounds of the participants, and the approach they took when they designed their events, among others. These, in turn, influenced the outcome they wanted to the get and how the HSK was used. Table 1 shows some of these factors.

Despite the differences among the hackathon processes followed by and the end results obtained by the pilots, the internal documents reveal one common pattern regarding tool use: the ODL Platform was underutilized or not used at all.

Characteristic	BCN	CPH	KSD	MIL	RTM
Found specific datasets (directly) relevant to their theme	✓		✓	✓	
Found generic datasets (directly) relevant to their theme		✓			✓
Data owners brought and presented their data	✓		✓	✓ *	
Used the ODL Platform	✓	✓			
Used open data from the ODL Platform		✓			
Used open data from other sources		✓	✓		
Among the participants there were coders/developers	✓	✓	✓	✓	
Produced prototypes	✓	✓	✓	✓	
Coded apps			✓ **	✓	
Number of emerging solutions	6	6	4	6 app prototypes and 5 mock-ups	0

Table 1.

* There was a stakeholder who presented data, but they were not the data owner.

** Not a finished app or final product.

4 Hackathon Crew Evaluations and Extended Reports

Case Study: The CPH Pilot and the ODL Platform

The case that this master thesis is about concerns the development of digital tools that can give support to co-design processes. Due to time constraints and limited resources, the focus will be on the CPH pilot and specifically on the ODL Platform.

The ODL Platform will be examined, with the intention of identifying the possible reasons why it was underutilized on the first hackathon. From these insights a suitable concept will be created.

Stakeholder Map

A stakeholder map is a visual representation of the groups involved in a service and the interplay between them (Stickdorn & Schneider, 2015, pp. 150-153). For the CPH Pilot, the internal and external stakeholders were categorized according to the areas of the hackathon process in which they had interests and made contributions. The center represents the activities that form the hackathon process (Fig. 7).

In addition to the visual representation, Table 2 shows what the stakeholders gave and gained from participating in the different stages of the hackathon process.

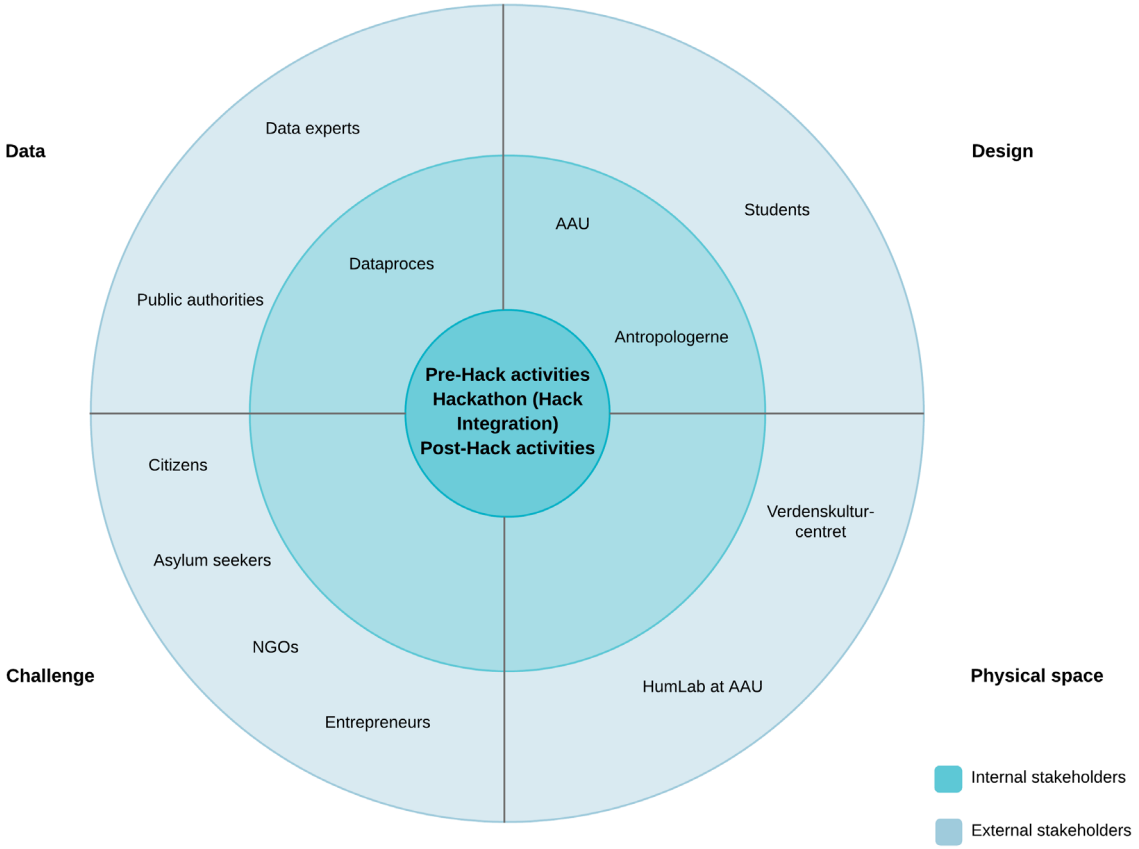


Fig. 7.

Stakeholder	Gives	Gains
Internal		
AAU	• Expertise within service design/user centered design • Facilitation of pre-hack, hack and post-hack activities • Access to a broad network of possible relevant stakeholders	• Helping out to create open data-based concepts • Beginning to establish an open data community
Antropologerne	• Applied anthropology and ethnographic methods for user research • Creation of the hackathon toolkit • Access to a broad network of possible relevant stakeholders • Facilitation of pre-hack, hack and post-hack activities	• Feedback to feed into what will be the Citizen Toolkit • Helping out to create open data-based concepts • Beginning to establish an open data community
Dataproces	• Technical know-how in working with open data • Programming the ODL Platform	• Feedback to improve the ODL Platform • Helping out to create open data-based concepts • Beginning to establish an open data community
External		
Public authorities	• Datasets	• Raising citizens awareness about open data • Generating the seeds to implement a new generation of useful open data-based public services

Table 2.

Students	• Skills and knowledge in various areas	• Build a network • Concepts that they can use in their portfolio • Experience in creating solutions in a short period of time • Learn about new tools and practices
Data experts • OpenStreetMap • Mapillary • Open Knowledge Foundation • Sweco/Kortdage conference	• Skills and knowledge in various areas • Inspirational talks • Tools (for ex. Open Street Map)	• Promotion • New business opportunities
Entrepreneurs • Creature • Forening Nydansker • Techfugees DK	• Skills and experience in various areas • Support in post-hack activities	• Promotion
NGOs • Venligboerne • Red Cross - New Times • ASIG	• Skills and knowledge, esp. about integration matters	• Promotion
Asylum seekers	• Firsthand experience in integration matters • Skills in various areas	• Build a network • Be a part of the created solutions • Have a valuable input in in the creation of services/solutions that will fit their needs
Citizens	• Skills and knowledge in various areas	• Build a network • Be a part of the created solutions • Knowledge on open data and active engagement in city solutions.
HumLab and Verdenskulturcenter	• Physical space to host the activities	• Promotion

The Hackathon Process Followed at CPH

In addition to carrying out the activities pertaining described on page 12, the Pre-Hack Phase revolved around a workshop at Verdenskulturcenter, in which the first 4 parts of the HSK were introduced. The intention was to turn the concepts created in the workshop into defined challenges that could be worked further at the hackathon. However, these concepts could not provide a strong ground for activity and therefore were discarded. That said, there were some learning points from this event, in terms of possible actors and directions to research open datasets.

From this process, the general topic of "integration" was subdivided into three sub-areas:

- Networks/Networking
- Employment, Competences and Diversity
- Open Investigations

The big event in the process was the hackathon Hack Integration. It was a 3-day event where engaged citizens, design students, activities and newcomers, etc., came together, worked on all the stages of the HSK and generated 6 emerging ideas. In addition to the facilitator team from the CPH pilot, the participants had some extra help from data experts from different initiatives.

The Post-Hack Phase consisted of tailored activities based upon merging ideas that were similar or that could work well together, the feasibility of these combined ideas, participant interest and their expressed needs through evaluation and post-hackathon survey. These activities consisted of workshops on pretotyping, building a business strategy and prototype part of their service, and how to make a proposal to receive funding.

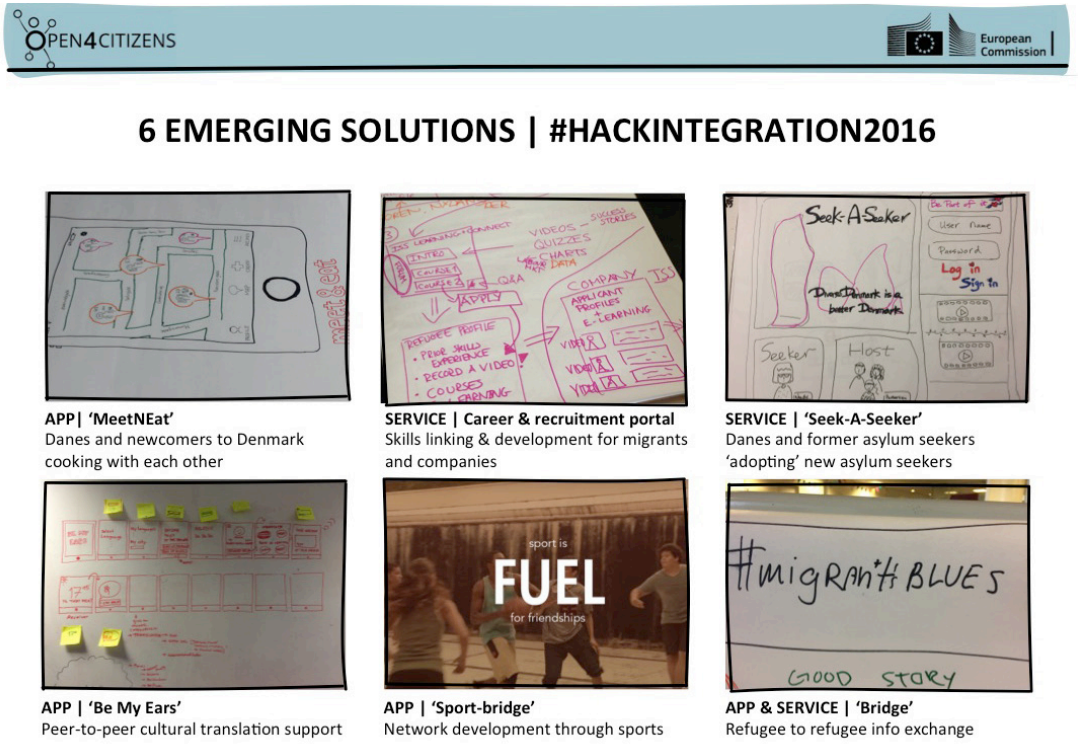


Fig. 8. The concepts created at Hack Integration.

Initial Problem Statement

To steer the design process, the following initial problem statement has been made:

How might we improve the usage of the ODL Platform to support co-design* processes?

* As defined in the Glossary.

Discover

This chapter is written primarily from **field research**, hereby represented by an interview with an internal stakeholder and professional experience as an intern for O4C. **Desk research** will complement the gaps between these 2 phases, and it will based upon internal documents. Then, further investigation will be carried out using the tools specified in each section.

Overview of the ODL Platform

Current Characteristics

In its current beta version the ODL Platform is a combination of:

- An introduction to open data
- Inspiration cards with concrete examples of solutions created using open data
- A repository for datasets related to the O4C hackathons
- Data visualization tools
- Several kinds of useful links
- Tutorials for the different tools
- A guide on how to use the Platform itself (Open4Citizens, 2016c, p. 23)

Contexts of Usage

The ODL Platform is conceived to be used in two contexts. One is at an **organized co-design event**, which is the current case in the O4C project. In this context it is sought to form multidisciplinary teams with complementary skills and whose members can look at an issue from the different perspectives their backgrounds give them.

To that end, the Hackathon Organization Handbook (Open4Citizens, 2016d) has been created. It contains guidelines and practical tips on how to run these events, and it is available at the ODL Platform.

The other is an **independent context** and refers to a citizen or a group of citizens who wish to use the platform to create an open data-based solution but without the formalities of a codeisgn event. However, O4C has not yet defined this context[5].

Finally, the ODL Platform should work regardless of the idea or topic to be explored, so long as there are open datasets available.

Heuristics Evaluation

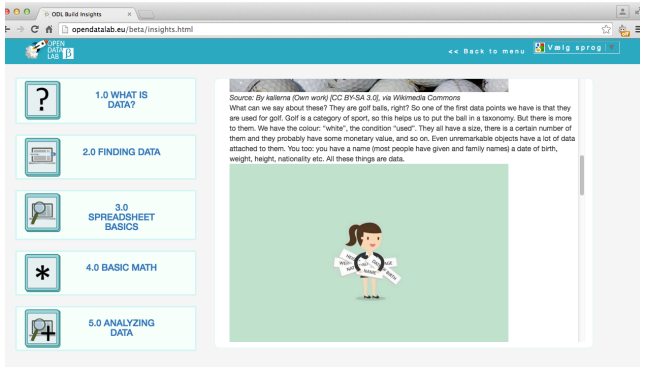
An assessment of the ODL Platform was made, in order to learn how easy it is to use and to identify any possible pain points that could reduce its quality of being usable for the chosen target groups. To do that, a semi-structured heuristics evaluation has been carried out, together with following what is perceived to be the natural flow of the ODL Platform when it is accessed for the first time. A heuristics evaluation is a kind of usability test to determine the extent in which a website or app complies with generally accepted design guidelines and best practices (Snitker, 2004, p.82), thus eliminating any obvious barriers of entry to the hackathon participants and making the platform usable in their eyes and minds.

For this evaluation, the perspective taken was a citizen who is not familiar with open data or the Platform, but who has some technical skills. Consideration will also be given to the esthetics of the Platform and how well it communicates what can be accomplished with it. Each pain point was ranked with a number between 1 and 3, where 1 represents an issue that is very critical and 3 is an issue that is not critical.

5 Interview with Dataproces - Appendix 1

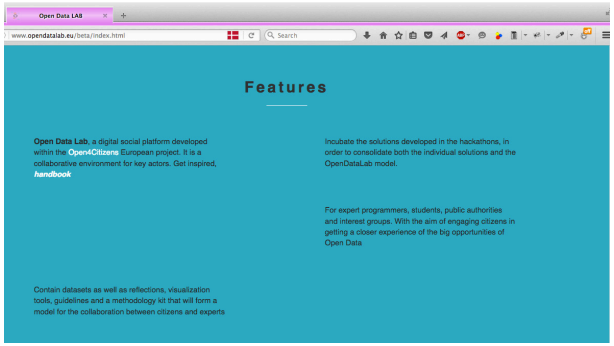
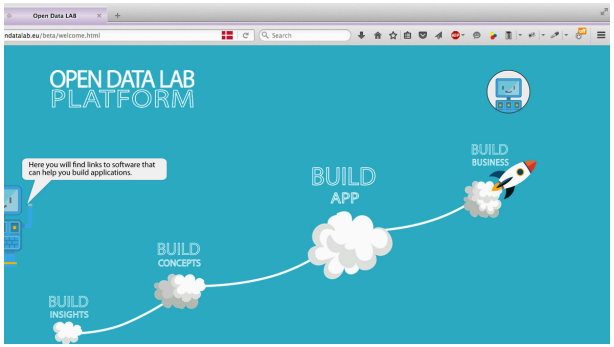
The Platform as a Whole

The ODL Platform has an appealing color scheme and a typography that is easily readable. The assistant robot gives a playful tone, which could be perceived as positive and communicates that data and that learning about data can be fun. In general, elements with similar functions have the same esthetics and behavior, giving the platform a consistent design. The exception to this are the pain points listed below.

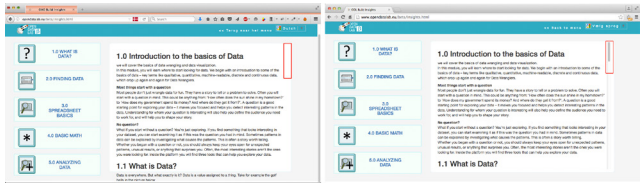
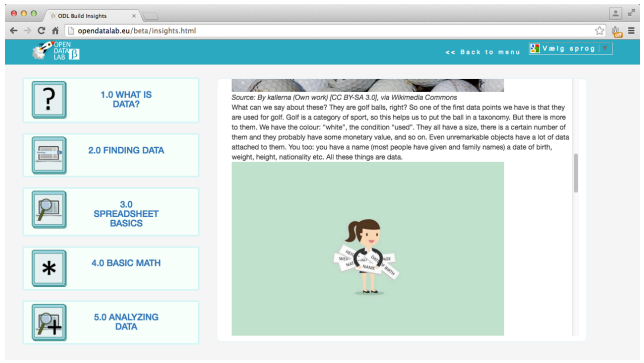
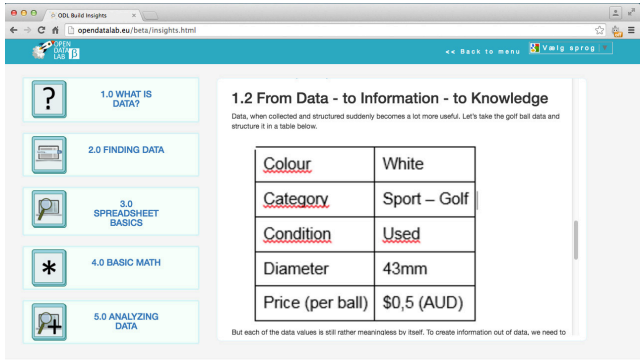
Pain point	Screenshot (if available)	Priority
There are errors in language or in spelling in several parts of the platform.		3
The handbook is not easily found from the other parts of the handbook.	-	3
Little to no space between text and graphics, which could affect readability. Text and graphics are not aligned to each other. Observed, e.g. in Build Insights > Data Introduction and Hackathon Handbook.		3

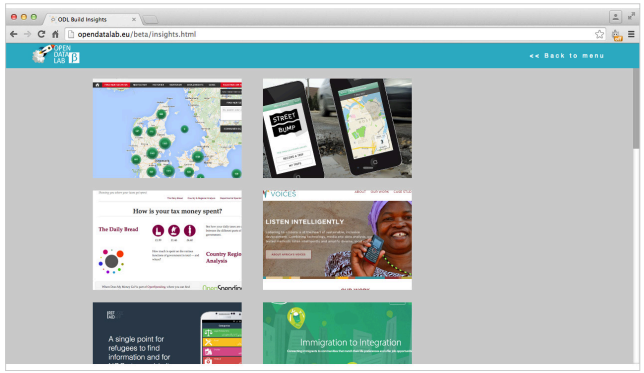
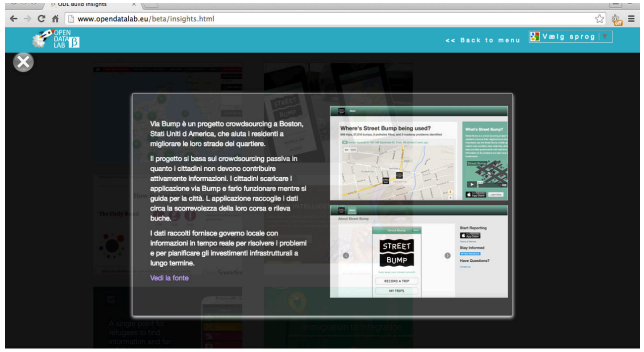
Landing Page

The landing page has 4 sections that are quickly and distinctly identified by the change in background color. Although not an issue as such, it is recommended to add a headline “Partners” on the section that shows the logos of all the partners that form O4C.

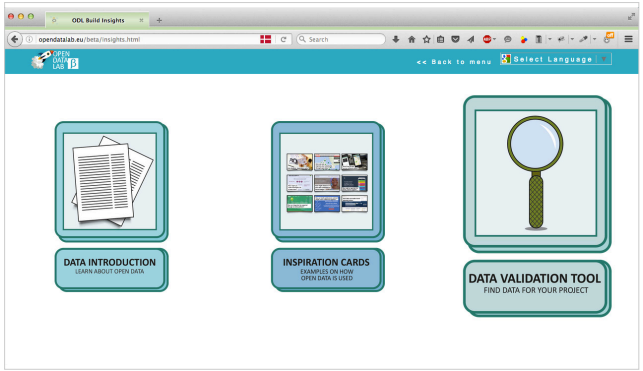
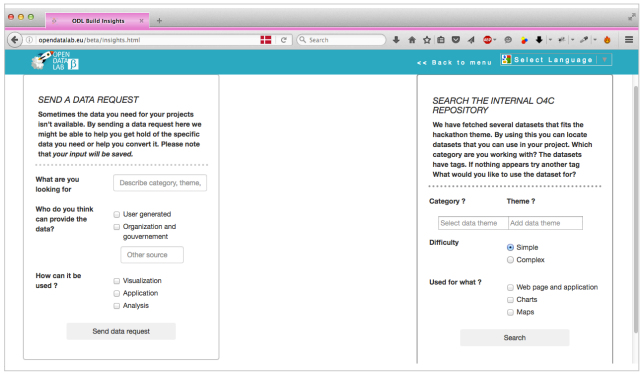
Pain point	Screenshot (if available)	Priority
The robot assistance is not displayed if it is deactivated and reactivated unless the page is reloaded.	-	2
One of the paragraphs in the section “Features” is not aligned with the other 3.		3
The links on this page open on the same window, thus reducing the amount of time spent in the ODL Platform.	-	2
The option Build Business is not an active link but looks the same as the other active options.		3

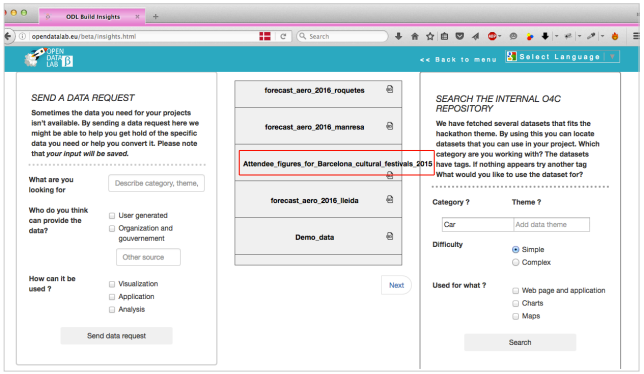
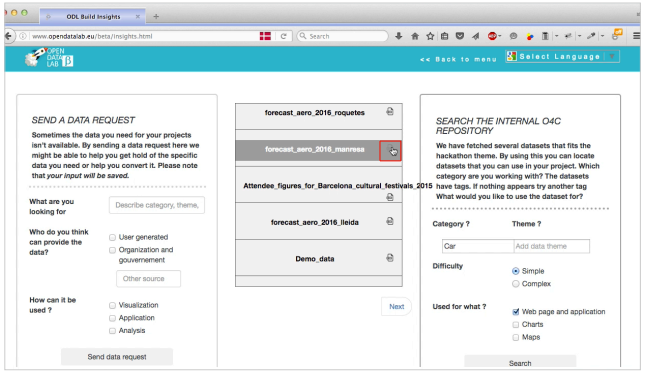
Build Insights > Data Introduction

Pain point	Screenshot (if available)	Priority
There is no scroll bar on Firefox and it is not possible to read all of the text.		2
Little to no space between text and graphics. Text and graphics are not aligned to each other.		3
Some screenshots seem to be taken from a Word document that shows spelling errors.		3

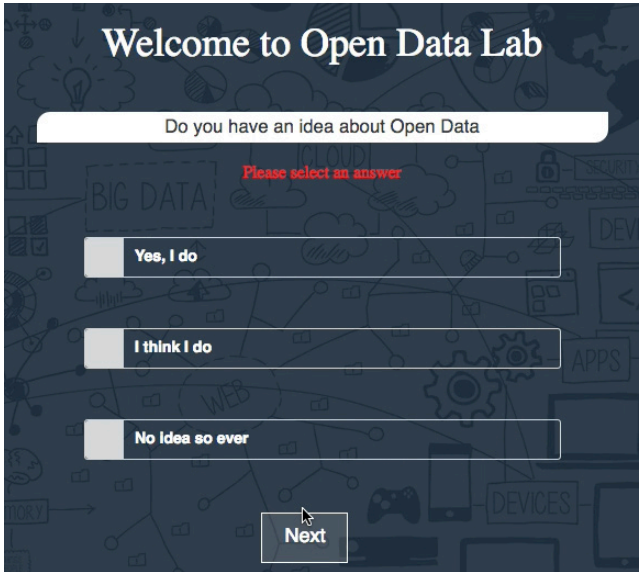
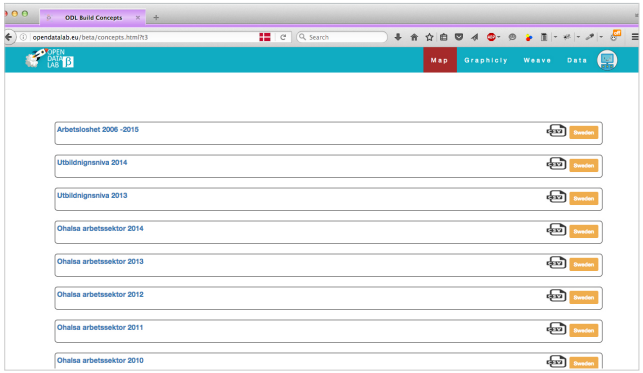
Pain point	Screenshot (if available)	Priority
The cards are not big enough to be fully appreciated.		2
The accompanying text is in Italian.	- 	2

Build Insights > Data Validation Tool

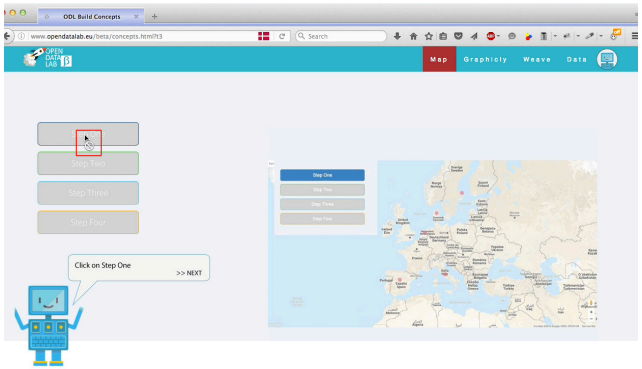
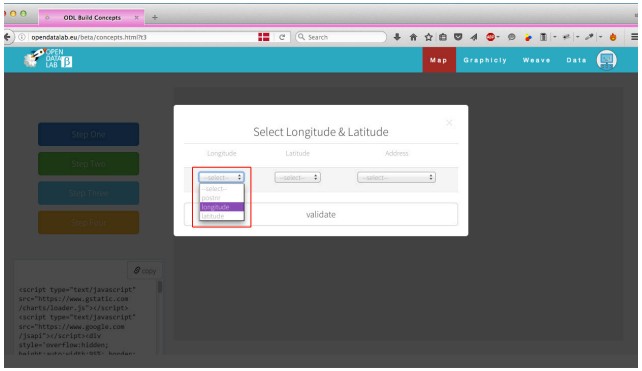
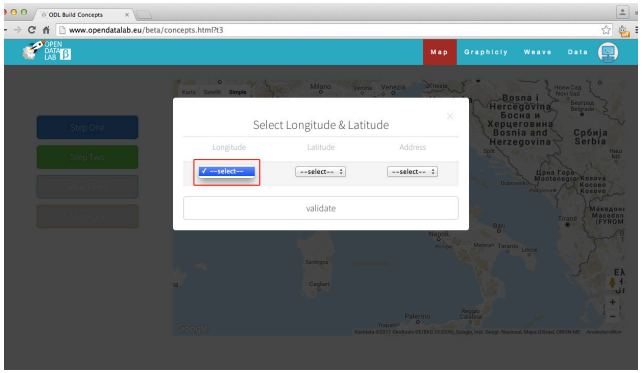
Pain point	Screenshot (if available)	Priority
Mismatch between the title “Data Validation Tool” and the processes this option leads to. There could be a misunderstanding where a participant thinks about the tool from the HSK with the same name. Furthermore, the icon of this element represents a search.		2
Confusing placement of the forms to send a data request and to find datasets that does not follow the perceived natural flow.		2
The forms do not indicate whether all the fields are required or not.	-	2

Pain point	Screenshot (if available)	Priority
Datasets with long names display outside of the boundaries of the gray box.		3
The mouse cursor changes to indicate that it is possible to click on the dataset, but nothing happens.		3

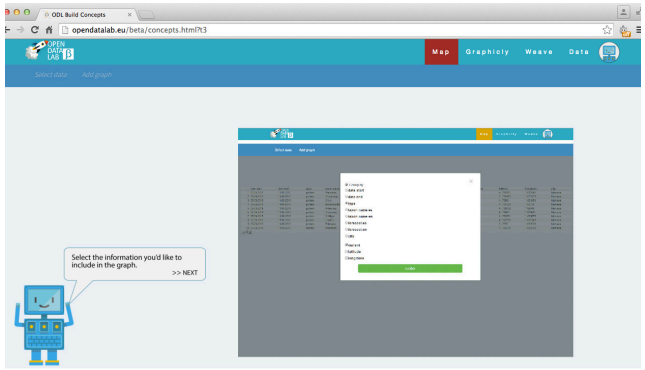
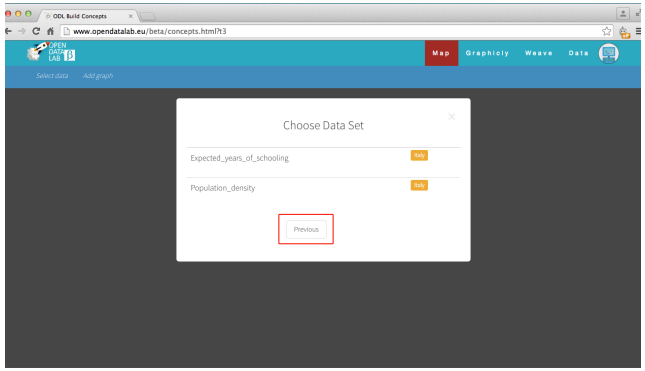
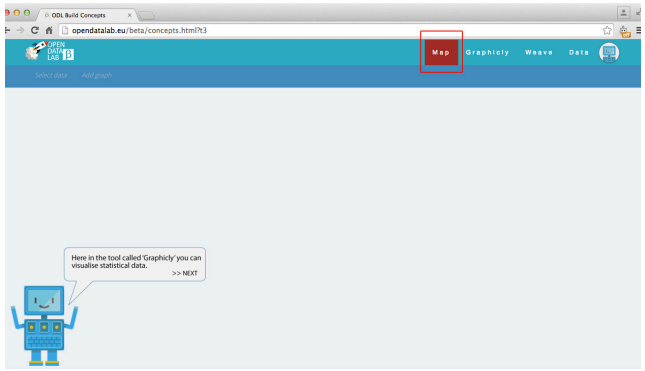
Build Concepts

Pain point	Screenshot (if available)	Priority
The form does not indicate that all the fields are required, but will give an error if any field is left empty.		2
The navigation menu does not show the actual page the user is in.		3

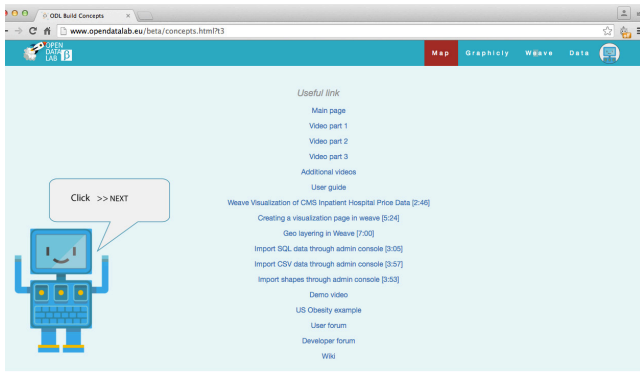
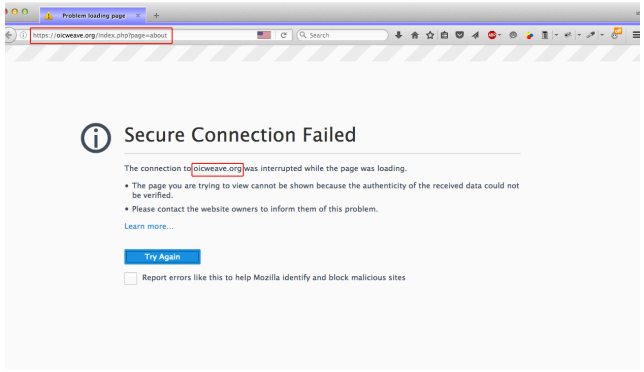
Build Concepts > Map

Pain point	Screenshot (if available)	Priority
It is not possible to click on any of the “Step” buttons without completing the tutorial shown by the robot assistance.		2
On Firefox: the options on the categories “Longitude”, “Latitude” and “Address” can be hard to read.		3
On Google Chrome: the options on the categories “Longitude”, “Latitude” and “Address” do not load.		2

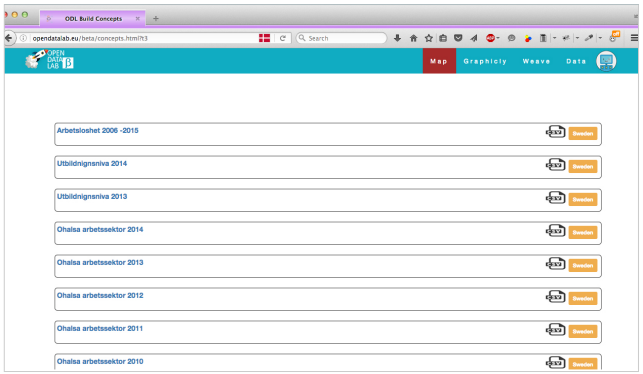
Build Concepts > Graphicly

Pain point	Screenshot (if available)	Priority
The participant must finish the tutorial that the robot assistance shows before they can use the links “Select data” and “Add graph”.		2
The call-to-action button in the window where datasets are selected is called “Previous” instead of, for example, “Choose”.		3
The navigation menu indicates that the page the user is currently seeing is “Map”, even though the user is on Graphicly or another page.		2

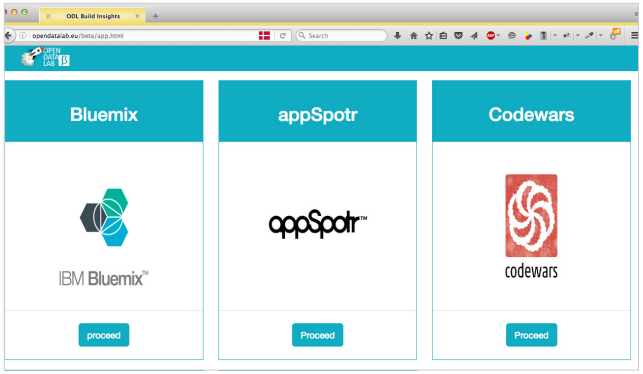
Build Concepts > Weave

Pain point	Screenshot (if available)	Priority
Some of the useful links could have a more descriptive name, for ex. “Video part 1”.		3
The link leading to https://oicweave.org/index.php?page=about does not work.		3

Build Concepts > Data

Pain point	Screenshot (if available)	Priority
The datasets are not categorized.		3
No search options available.	-	3

Build App

Pain point	Screenshot (if available)	Priority
This option presents links to external resources for building apps, with no explanation about what the participant can expect to find or what kind of resource they are (mock-up creation, APIs, etc.)		3

Sub-conclusion

Based upon this evaluation and the issues found, it can be concluded that the ODL Platform does not have many critical points that may affect its functionality or deter anyone from using it. Therefore it can be experienced as very usable. Some of those issues can be worked around by changing the browser, but it would be advisable to make sure that it works in the most used browsers. Other issues concern attention to detail and esthetics. Addressing the found issues will lead to improvements for participants and facilitators alike.

Similar Existing Platforms

A search for other existing open data platforms was undertaken, but the majority of the results were data repositories and other data visualization tools, which are 2 components on the ODL Platform. There were, however, 2 platforms found that are considerably similar.

Citadel on the Move[6] (CotM): this is a European Commission funded project where citizens and app developers can create open data-based mobile applications.

Publicdata.eu: is a Pan-European project developed by the Open Knowledge Foundation. It aims to become the single point of access for datasets from public bodies across Europe, in various languages (PublicData.eu, n.d.).

Platform Comparison

A SWOT Analysis was made to gain understanding of the internal and external factors that affect the competitors' platforms (Stickdorn & Schneider, 2015, p.108) (Fahy, & Jobber, 2012). In addition, the platforms were compared specifically concerning their features and characteristics (Table 3). The objective is to identify possible areas for the ODL Platform to capitalize the strengths and opportunities, as well as to minimize the weaknesses and threats.

At the time of the writing of this thesis, PublicData.eu had parts that were no longer operational and an error message (Fig. 9) was received. Therefore, the analysis on this competitor was made on the parts that work.

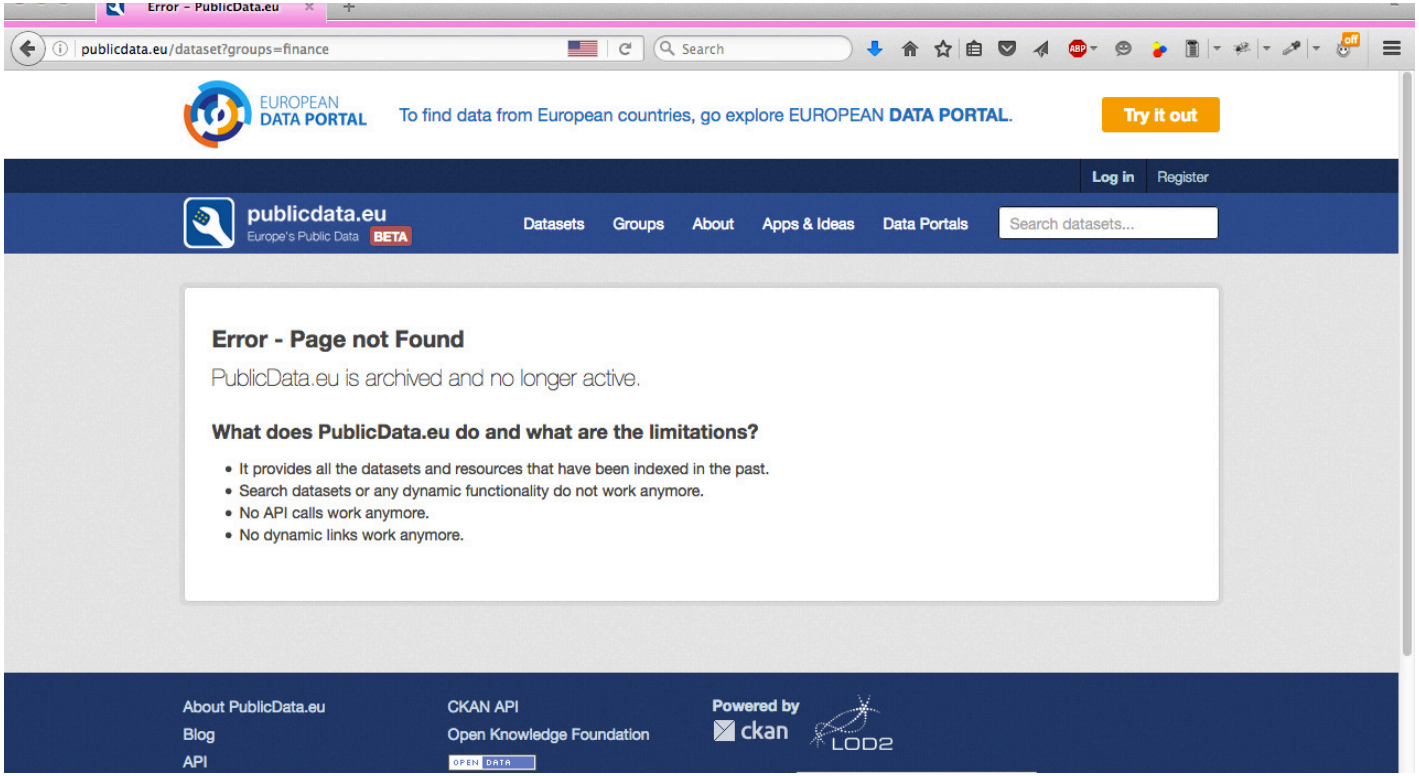


Fig. 9.

6 http://www.citadelonthemove.eu/

ODL Platform

Strengths	Weaknesses
• The ODL Platform was created with tech-savvy and non tech-savvy users in mind • It has a clearly defined and gradual learning curve • The website is easy to navigate • No critical issues found on the heuristics evaluation • There are tools for every level of data literacy • It has a guide about how to use the platform itself • It provides a hackathon handbook with tips for organizing codesign events • There is a dataset repository • It is possible to make a request for specific datasets • It has different kinds of app construction tools	• Underutilized in the first round of hackathons • The robot assistance was perceived as unclear • No possibility to export projects from other tools, f.ex. Balsamiq • The layout of text and images needs some tweaking for readibility • Some minor issues in functionality need to be tweaked • Compared to the competitors, the ODL Platform has fewer features to offer • The datasets are listed but not categorized or searchable
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in Denmark according to the Open Data Index (Open Knowledge Foundation, n.d.a) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors who offer more features • Competitors with built-in and free tools

Citadel on the Move

Strengths	Weaknesses
• It has tools for every level of data literacy • Built-in tools to manipulate datasets • Tutorials for the tools, in text and video • Possibility to create a profile and access the created apps and datasets • Search options for datasets available • All the tools in the platform are free • Possibility to create an app in a few minutes with their built-in app generator tool • Possibility to download the code of the app • Installation and programming guide available online and with the downloaded code • FAQ, forums and "Ask a Citadel Expert" options if help is needed • It has app and dataset catalogs	• Apps can only be created within 2 themes: events and parking • Not possible to visualize datasets before creating or during the creation of an app • Too many options on the website and no perceived prioritization • There is no clear learning curve • Datasets only about some cities • Not possible to save work in progress
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in the countries represented, according to the Open Data Index (Open Knowledge Foundation, n.d.b) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors who can develop websites with better features and information architecture • Competitors with an easier learning curve • The application generator tool might be perceived as too simple by expert coders

Publicdata.eu

Strengths	Weaknesses
• Developed by a strong organization: Open Knowledge Foundation • Registration and login options • It features app and idea catalogs • It has a dataset repository by categories • The website is organized and has good readability • There is a search option available • Possibility to personalize data browsing by saving links and creating notes on datasets • Offers basic tools for data analysis and visualization • It has a list of open data portals	• Datasets only about Europe • It seems that to use the data tools one must log in to the platform • Not possible to visualize or download the datasets • It is not possible to assess the learning curve the platform has • The platform is not fully operational, with many parts that are closed or archived
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in Europe according to the Open Data Index (Open Knowledge Foundation, n.d.b) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors with fully operational platforms • Competitors who can develop websites with better features • Competitors with an easier learning curve

Feature	ODL Platform	CotM	Publicdata.eu
Data related tools			
Data visualization tools	Yes	Yes (after creating apps)	They claim they have them but it is not possible to access them.
Create own datasets	No	Yes	Unknown
Publish own datasets	No	Yes	Unknown
Test datasets	No	Yes	Unknown
Convert datasets	No	Yes	Unknown
Request datasets	No	Yes	Unknown
Learning Tools			
Tutorials/guides	Yes (text and animations)	Yes (text and videos)	Unknown
Installation/programming guide	No	Yes	Unknown
Other features			
Registration/login/create profile	No	Yes	Yes (not operational)
Dataset repository	Yes (not categorized)	Yes	Yes

Table 3.

App catalog	No	Yes	Yes
App construction tools	Yes (pointing to external resources)	Yes (bulit-in)	Unknown
Download the app code	No	Yes	Unknown
Search options	Yes	Yes	Yes (not operational)
Forum/community board	No	Yes	No
Other			
Suitable to use in a hackathon	Yes	Yes according to https://goo.gl/PZuASC but there is no information about how it was used	Unknown
Gradual learning curve	Yes	No	Unknown

Sub-conclusion

From this search it was learned that there are few open data platforms that offer tools to visualize and learn about data, and create data-based applications and services, all in the same place. This, together with the rise in the usage of open data, could indicate a niche market where the ODLP could have the potential to become a strong player. The platform comparison shows areas where the ODLP can be improved and features that it could incorporate in order to gain competitive advantage.

Challenges Using the ODL Platform

During the hackathon event the CPH pilot encountered challenges in the usage of the ODL Platform. The challenges stem from qualitative data representing 3 different points of view: observations at the hackathon, feedback from the participant evaluations and the post-hackathon survey, and the hackathon crew evaluation.

The initial results were analyzed using traditional coding, in that they were clustered according to similarity or frequency in which the issue was identified in more than one point of view, and then categorized in topics (Bjørner, 2015). In some cases it was noted that one particular issue could have possible causes or consequences found within the analyzed data.

To see the complete list of challenges, please refer to Appendix 2.

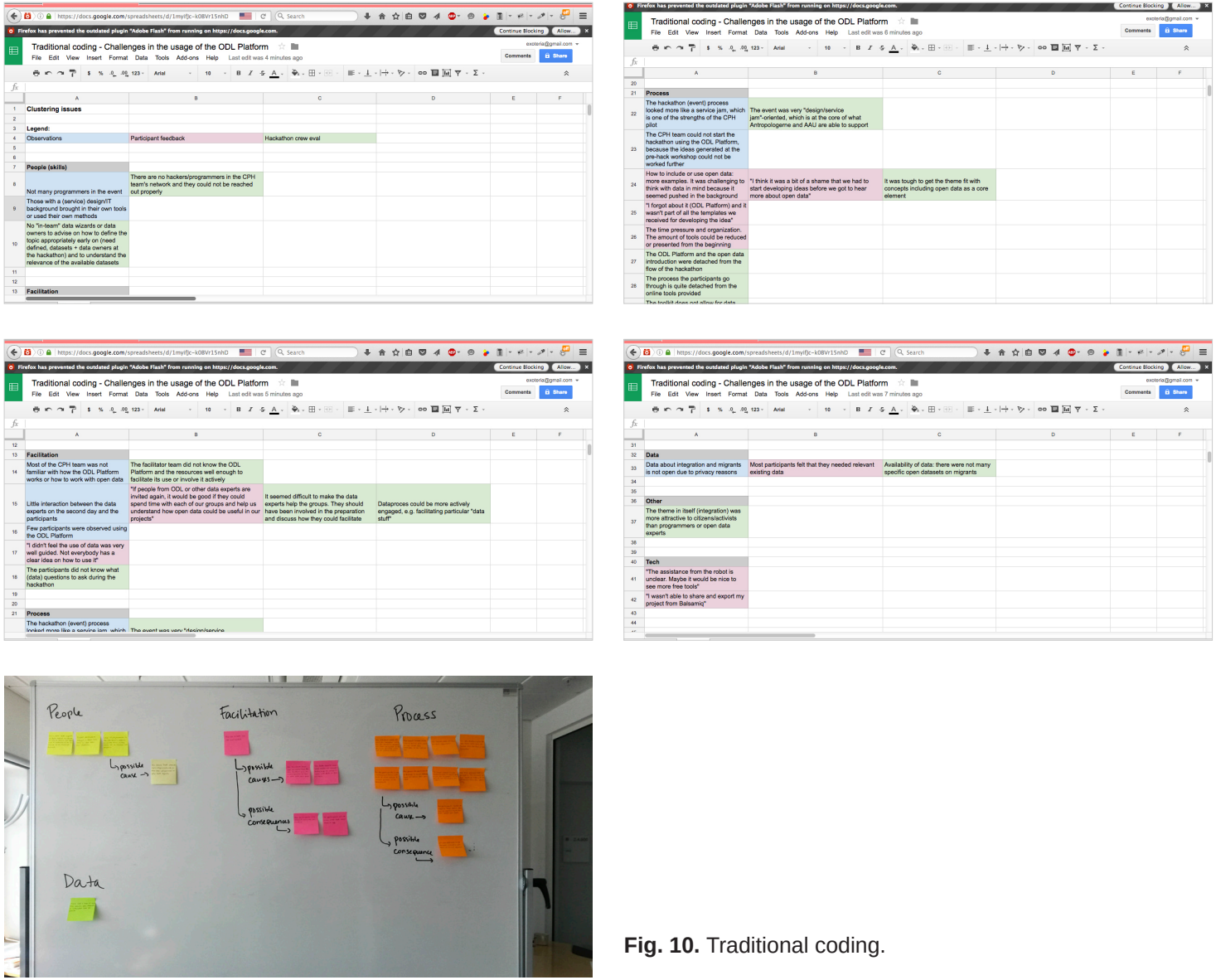


Fig. 10. Traditional coding.

People (skills/factors)
This area is characterized for skills and expertise that were missing or not fully utilized, and a habit was that observed.

- No “in-team” data wizards or data owners to advise on how to define the topic appropriately early on (need defined, datasets and data owners at the hackathon) and to understand the relevance of the available datasets
- Lack of programmers in the CPH team’s network or at the event, as the could not be reached out properly.

  This could possibly be explained by the theme being more attractive to citizens and activists rather than programmers (or open data experts).
- Expert participants brought in their own tools or used their own methods

Facilitation
In this area the main challenge found is that the **use of data was not well guided**. Within the analyzed data, two possible causes were identified:

1. The facilitator team did not know how the ODL Platform and its resources work or how to work with open data
2. The data experts available could not successfully help the groups to work with data in their concepts

Consequently,

- Few participants were observed using the ODL Platform
- The participants did not know what data questions to ask

Process
Within this area it was found:

- The event looked more like a service jam, which is one of the core strengths of the CPH pilot
- The CPH team could not start the hackathon using the ODL Platform, because the ideas generated at the pre-hack workshop could not be worked further
- For the participants it was challenging to think with data in mind. The data part seemed pushed in the background and it was difficult to get concepts including open data as a core element, as they started developing ideas before they heard more about open data
- For the participants it was challenging to think with data in mind because it seemed pushed in the background

  One possible cause for this issue could be that the participants started developing ideas before they had the opportunity to hear more about open data. Consequently, it was difficult to get concepts including open data as a core element
- “I forgot about it (ODL Platform) and it wasn’t part of all the templates we received for developing the idea”
- The time pressure and organization. The amount of tools could be reduced or presented from the beginning
- The process the participants go through is quite detached from the online tools provided
- The toolkit does not allow for data exploration
- The ODL Platform and the open data introduction were detached from the flow of the hackathon

Data
There was a lack of available specific open datasets on integration and migrants.

Tech
These issues look more like possible areas for improvement rather than reasons that affected the usage of the ODL Platform.

Interview with Dataproces

Dataproces was interviewed in their capacity of having participated in all the hackathons, thus having acquired a knowledge that nobody else in O4C has. They observed the dynamics that arose at each hackathon and, in their experience, the following are some of the factors that may have influenced the little use of the ODL Platform.

First of all, they believe that the ODL Platform was not included in the hackathon process. This is a point that has 2 aspects. The first aspect concerns the development of the platform, in that they did not receive clear requirements of which features the platform should have when they started coding, except for the availability of data visualization and manipulation tools. Thus, it was not possible to know exactly what to build and coding is an activity where concrete outcomes and visions are required.

The second aspect is the role the platform played at the actual hackathons. They created the platform with focus on analyzing and giving a visual understanding of the data, but based upon their observations, the objective of the hackathons was only on brainstorming and coming up with a new idea, and that when it was time to use the platform then the event was finished.

At the hackathons they noticed that the expert participants would bring in their preferred tools to work with.

They experienced that due to the time pressure of the hackathons, participants with little to no data literacy did not have time to get acquainted with the ODL Platform and learn about data during the events. They believe that this is something that should have happened in the Pre-hack phase or at a time before the hackathon, or that the pilots suggest their participants to read up before the hackathon. However, Dataproces wonders if giving participants “homework” is a good approach.

Although not relevant to CPH it is worth mentioning that in some of the pilots there were data owners present who brought in and explained what could be done with their data. In those cases the participants did not consider necessary to visit the ODL Platform to look for datasets.

The interview covered what Dataproces wishes the platform could be, which is a place where participants could register for the hackathons, create a profile and start getting familiar with it before the hackathon. Whatever they make during the event could be saved there and the participants could return to the platform whenever they want to keep working on the data with the other tools.

Part of Dataproces’ role in supporting the ODL Platform is to make sure that the datasets are operational prior to the hackathons. In that sense data can be challenging because a dataset could be lacking every detail or have inconsistencies in the X or Y coordinates. Sometimes they would receive a large dataset and it made sense to simplify it and turn it into smaller datasets divided by years, in order to make them relevant and easier to handle. It is their job to do the data filtering and to prepare the datasets, and for that they need a minimum of 3 weeks before the hackathon to be able to manage.

One point that came out of this interview clarified an assumption had when exploring the platform (see Heuristics Evaluation). It was believed that in the “Build App” section not only could a user be able to make a mock-up of the app screens, but also that the user could do the coding of the app, once a suitable dataset for an idea was found and visualized. Dataproces expressed that the platform’s intention is to visualize data and that any coding or app building should happen outside of the platform.

They are currently working on a second

iteration of the ODL Platform, in which they will attempt to digitalize the rest of the HSK, offering their target groups options in terms of tools to use in their co-design events. While they wish the Platform to play a bigger role in the hackathons, as expressed in the above paragraph, they also are clear that they do not want to make anything redundant.

To see the full transcript of the interview please refer to Appendix 1.

Target Groups

Knowing the target group allows to tailor the service offerings in order to fulfill their goals, needs and wants. In the case of the ODL Platform, it was conceived to be an inclusive tool, in accordance to O4C's general vision. As such, it should be used by "everyone", from which 2 loosely defined target groups have been identified.

The first one is the **facilitators**, which are those in charge of designing and running the co-design events.

The second group is labeled as **participants**, and encompasses citizens, public authorities, startups, NGOs, caseworkers, etc. In addition, their proficiency in the use of computer or internet-related technologies (e.g. web or app programming) can range from complete beginners to expert users.

Concerning this group there are two basic assumptions:

- A data expert is most likely not going to use the ODL Platform because they already have their preferred data visualization tools, unless the expert needs help to come up with concepts or to program an app
- People with intermediate or advanced IT skills may not necessarily have knowledge about data, but it is assumed that it will be easier for them to learn to use the digital tools

Summary/Key Findings

The following are the main findings identified throughout the Discover phase.

Target Groups

- Two target groups have been identified: participants and facilitators. However, these groups need a clear definition

Contexts of Usage

- The ODL Platform can be used in co-design contexts and independently, i.e. if a citizen or a group of citizens want to use the Platform by themselves
- In addition, the Platform should be separated from the content, in that it should work with any idea or topic, so long as there are open datasets available

Heuristics Evaluation

- From the heuristics evaluation it was found that the ODL Platform is considered very usable, as there are not many critical issues that affect its functionality. The issues found refer to attention to detail, esthetics and browser compatibility at a code level

Interview with Dataproces

From the interview with Dataproces the following factors were learned, which may have contributed to the underutilization of the ODL Platform.

- The ODL Platform was not included in the hackathon process. This factor can be seen in 2 ways:
  - The development of the platform, meaning that there were not clear requirements of the features the Platform should have, with the exception of the data visualization and manipulation tools
  - The role of the platform at the events, as it was observed that the hackathons focused on brainstorming and coming up with new ideas, and when it was time to use the platform then the hackathon was finished
- Because of time pressure, participants with little to no data literacy did not have time to familiarize with the ODL Platform and learn about data during the hackathons
- In hackathons where there were data experts who brought in their data and explained what could be made with it, there was no need to use the ODL Platform

In addition, it was learned that the intention of the platform is to visualize data, and that any coding or app building should happen outside of the platform.

Similar Existing Services

Searching for similar open data platforms it was found that there are few platforms where a citizen can find tools to visualize and learn about data, and create data-based applications, in the same platform.

- Two competitors that are similar to the ODL Platform were found: Citadel on the Move (CotM) and PublicData.eu
- CotM is a platform that offer, among other features, built-in tools to create apps and manipulate data. It offers the possibility to download the app code, including an installation and a programming guide. Two weaknesses are that it is not possible to save work in progress and that visualizing data is only possible after an app is created
- PublicData.eu is a platform that is partly operational. Some features that can be observed are a dataset repository, an app catalog and registration and login options, but the latter do not work
- Comparing the ODL Platform with the competitors, it was possible to find areas and features where the ODL Platform could improve to become a stronger player, such as to include more tools for manipulating data, introducing an app catalog and registration options

Challenges in the Usage of the ODL Platform

The underutilization of the ODL Platform in the hackathon event cannot be attributed to one or 2 single reasons. Through traditional coding of qualitative data, representing 3 different points of view, issues in 4 areas were identified as follows.

People (skills/factors)

- No “in-team” data wizards or data owners to advise on how to define the topic appropriately early on (need defined, datasets and data owners at the hackathon) and to understand the relevance of the available datasets
- Expert participants brought in their own tools or used their own methods. This was also observed by Dataproces
- Lack of programmers in the CPH team’s network or at the event, as the could not be reached out properly.

  This could possibly be explained by the theme being more attractive to citizens and activists rather than programmers (or open data experts).

Facilitation

The use of data was not well guided, which could have been caused by:

- The facilitator team was unfamiliar with how the ODL Platform and its resources work or how to work with open data
- The data experts available could not successfully help the groups to work with data in their concepts

And two possible consequences are:

- Few participants were observed using the ODL Platform
- The participants did not know what data questions to ask

Process

- The event looked more like a service jam, which is one of the core strengths of the CPH pilot
- The CPH team could not start the hackathon using the ODL Platform, because the ideas generated at the pre-hack workshop could not be worked further
- For the participants it was challenging to think with data in mind because it seemed pushed in the background
- One possible cause for this issue could be that the participants started developing ideas before they had the opportunity to hear more about open data. Consequently, it was difficult to get concepts including open data as a core element
- “I forgot about it (ODL Platform) and it wasn’t part of all the templates we received for developing the idea”
- The time pressure and organization. The amount of tools could be reduced or presented from the beginning
- The process the participants go through is quite detached from the online tools provided
- The toolkit does not allow for data exploration
- The ODL Platform and the open data introduction were detached from the flow of the hackathon

Data

- There was a lack of available specific open datasets on integration and migrants

Addendum: Field Research at Open Tourism Days

Late in the thesis process an opportunity arose in which it was possible to do some field research at Open Tourism Days[7] (OTD). OTD is an open data-based hackathon where digital solutions are created within the topic of tourism and with cases defined by organizations such as VisitAarhus, Wonderful Copenhagen, Frederiksberg Municipality, VisitDenmark and VisitAalborg. OTD is an event created by Open Data DK in collaboration with the aforementioned case owners, as well as other partners as expressed on their website.

The field research undertaken consisted of general observations of the dynamics of the hackathon and semi-structured interviews to organizers and case owners, with the intention of getting inspiration for developing the ODL Platform.

Here are the **main insights** collected at this event. For the information in full please refer to Appendix 3.

Observations

- There seemed to be a good distribution of participants with expertise in programming, design, tourism, and business. The backgrounds were indicated by color coded name tags
- The team formation was made by the participants, following a few guidelines:
  - They would start by asking questions to the case owners for about 15 minutes, after each case owner had presented their case, and decide individually which case they were interested in
  - Afterwards, they were to build a team of 4 to 6 members with different backgrounds as mentioned above and who were interested in the same case
- The OTD website acted as a single point of contact, where participants had access to the datasets, the cases, some suggested tools and other relevant info
- There were mentors available on the second day, all from different areas relevant to the overall theme: tourism, data, law/ intellectual property, programming (web, software, etc.), business, marketing and design
- The preparation of the mentors consisted of:
  - A 10-to-15-minute brief where they were informed of what is expected to happen on the hackathon's second and third days, and they were told to spend some time with the groups, as there would be no dedicated mentor to any group
  - A one-minute status report where the groups talked about what their idea is, how far they are working with it and what they needed help with
- The participants chose which mentor they wanted to talk to first, after the mentors introduced themselves and mentioned which were their areas of expertise
- During the second day the groups were still on the early stages of concept creation, although some groups were farther ahead than others. However, from their one-minute status report and observations to their workspaces, it seems that the groups started brainstorming ideas from the case question and then integrated data, rather than start from the data available within the case they chose in order to come up with solutions
- There was a feeling of easiness to the hackathon, possible because:
  - There were several energizers
  - The presentations by Open Data DK were entertaining and informative, with funny visuals to support the transmission of important information
  - The hackathon schedule had structure but was not rigid
  - There were not many tools or

7 http://www.opentourismdays.dk

templates to use during the hackathon. OTD suggested some tools to use, which were linked from their website, but the participants were free to use whichever tool they preferred

- The participants had access to the cases and the datasets, as well as other relevant info prior to the event on the OTD website

Semi-structured Interviews

The interviewees were some of the case owners and staff from Open Tourism Days and they were asked about the case definition.

- Some of the cases were formed solely by the organization owning the case, while others were a collaboration between the organizations and Open Data DK. In one case there were 2 organizations collaborating, in addition to Open Data DK
- The cases were created with no citizen involvement, presumably because they took into consideration the organizations' strategies before they started exploring which issues they would like to have solved in the hackathon. However, citizen involvement would have been useful, as Open Data DK helped the organizations in phrasing the questions from the point of view of the tourist as opposed to the point of view of the organizations, which were how the cases were initially drafted
- Data was in the minds of the organizations as they were in the process of defining the cases. One organization had data from GuideDanmark[8] as the starting point, upon which they formed the case and added some more data to support said question, while the others started from the issues they had
- The datasets were available at the repository of Open Data DK as well as links to external repositories at the OTD website, but participants could find other data on their own if it was necessary for their solutions
- There were 3 technology sessions scheduled by IBM, Dexi.io and Open Data DK, with the purpose of presenting relevant tools to the hackathon participants. However, IBM and Dexi.io were unable to be there, so instead of Open Data DK hosting their technology session, so Frans from Open Data DK chose to walk around and talk to the groups about data and tools
- Open Data DK did not focus on which tools the participants used, but rather which data they integrated in their ideas
- Two of the groups shared their apps on their githubs. The winner group's idea "RideCopenhagen" can be seen at: https://github.com/na399/OpenTourism and the app WhatNowApp is available at: https://github.com/whatnowapp/whatnowapp.github.io.

  An observation deducted from looking at these apps, it seems that the solutions created at Open Tourism Days were made to a minimum viable product (MVP) level. At the time of the writing of this section, Open Data DK has not published all the concepts.

Sub-conclusion

As an observer at this event it was possible to see how the dynamics of a hackathon should be in order to foster an environment that contributed to the creation of solutions that had open data as the core element. The focus of Open Data DK lay in the data rather than the tools to use, thus it was up to the participants to choose the appropriate tools to use to build their solutions. In this case it is presumed that every group used what they were accustomed to rather than the suggestions present at the Open Tourism Days website.

Other factors that may have influenced this creative working environment were having a schedule that was not rigid, having well defined cases including possible relevant datasets, the case owners were available on the first day, there were mentors from different areas and data experts helping out the groups, and the presence of developers. Each group had at least one developer, as it was observed that the distribution of backgrounds was somewhat even. This allowed to have some functionality programmed into the solutions, at least to a MVP level.

8 http://www.visitdenmark.dk/da/danmark/guidedanmark

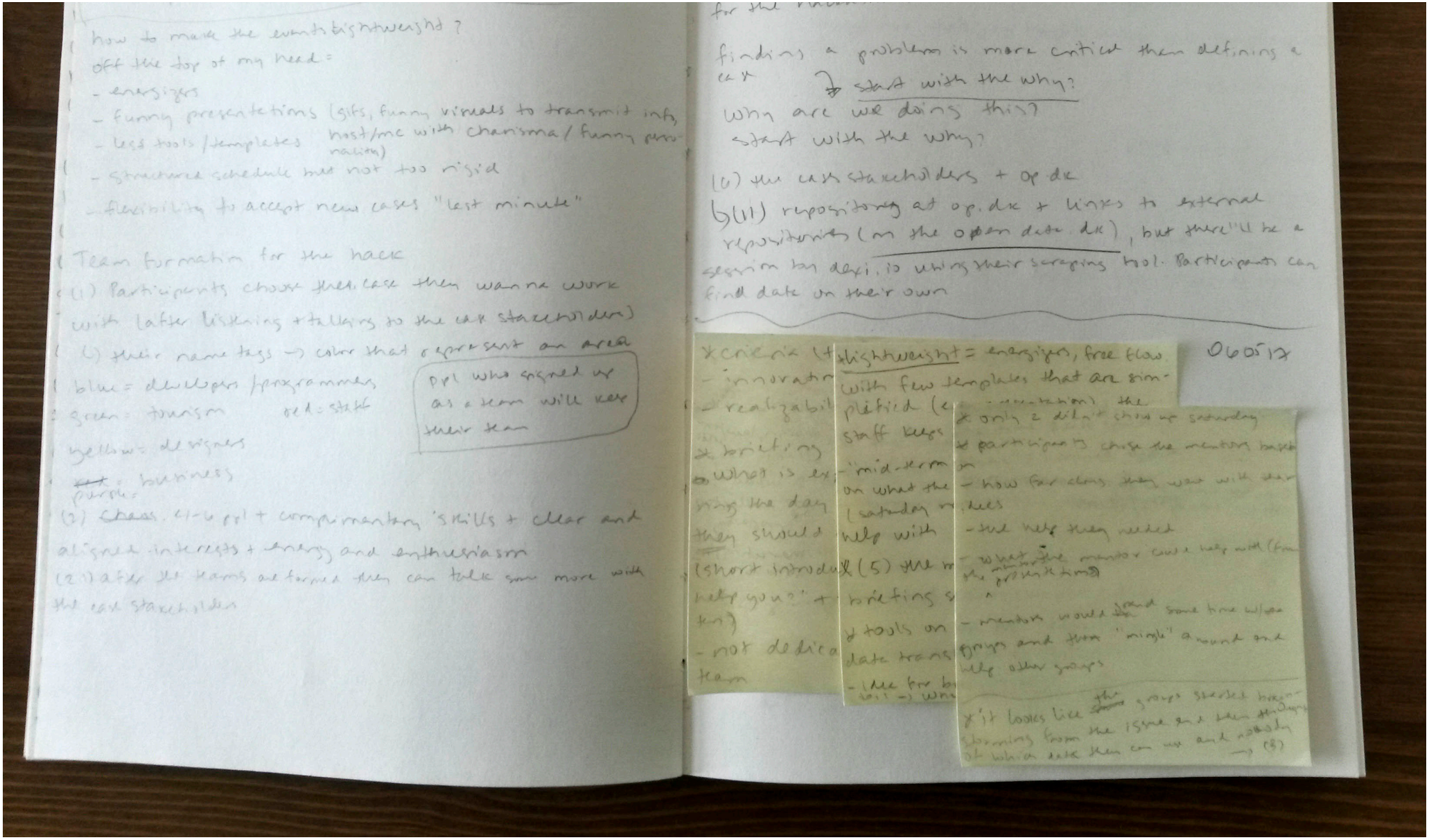
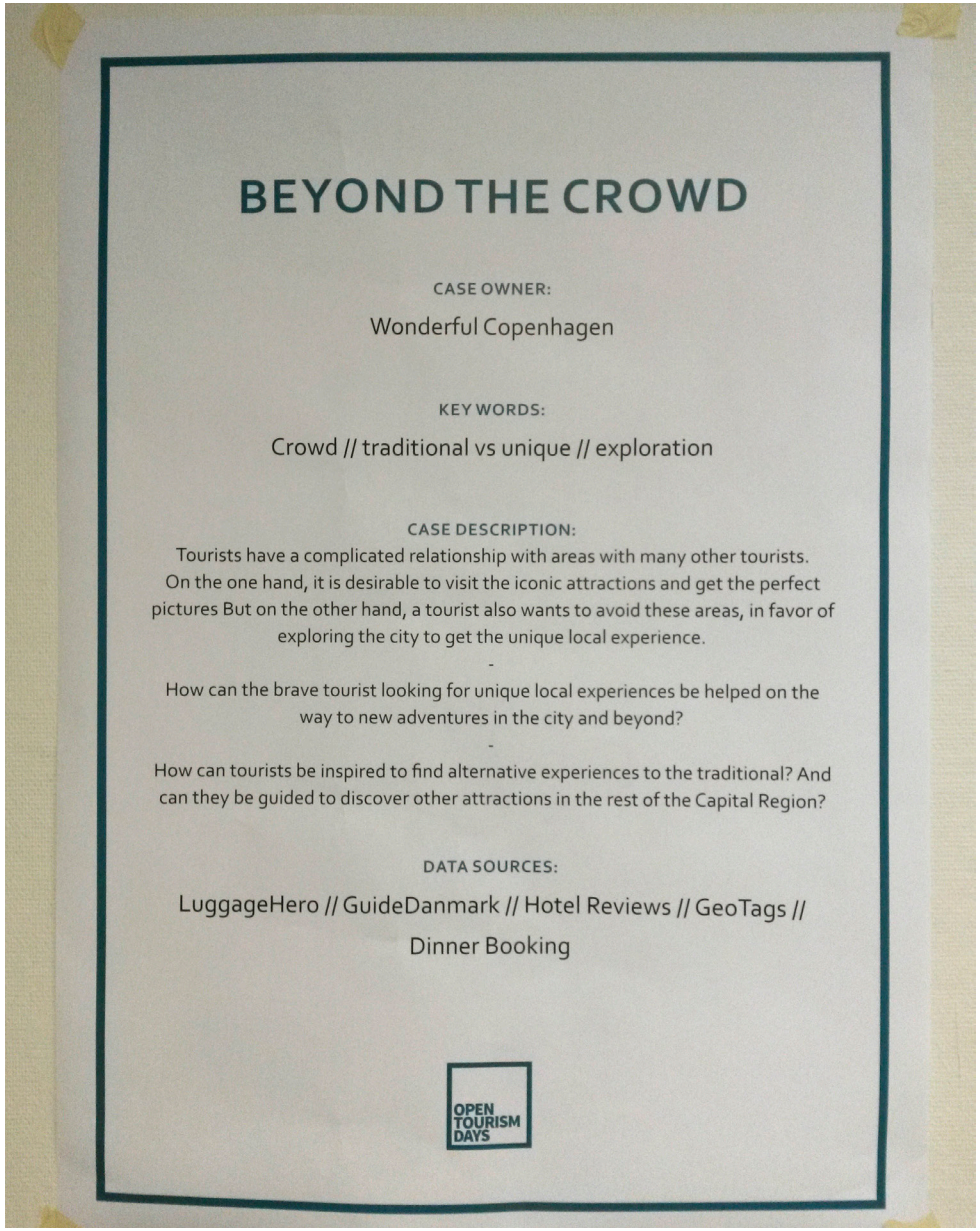


Fig. 11 (this page). Note taking at Open Touirsm Days.
Fig. 12 (next page). Examples of case posters.


RAINY DAYS
CASE OWNER:
VisitAalborg
KEY WORDS:
Weather // Attractions // Visit optimization
CASE DESCRIPTION:
There is somewhat unpredictable summer weather in Denmark, which means that we have rainy summer days. People visiting Denmark to stay in a summer house have typically booked their holiday many months in advance, and can only hope for good weather.
-
How can tourists get the best out of their vacation in bad weather?
-
How can a tourist find the best possible attractions and experiences that suit the weather forecast for their vacation?
DATA SOURCES:
GuideDanmark // Dinner booking // GeoTags // Weather data
OPEN TOURISM DAYS


BEYOND THE CROWD
CASE OWNER:
Wonderful Copenhagen
KEY WORDS:
Crowd // traditional vs unique // exploration
CASE DESCRIPTION:
Tourists have a complicated relationship with areas with many other tourists. On the one hand, it is desirable to visit the iconic attractions and get the perfect pictures But on the other hand, a tourist also wants to avoid these areas, in favor of exploring the city to get the unique local experience.
-
How can the brave tourist looking for unique local experiences be helped on the way to new adventures in the city and beyond?
-
How can tourists be inspired to find alternative experiences to the traditional? And can they be guided to discover other attractions in the rest of the Capital Region?
DATA SOURCES:
LuggageHero // GuideDanmark // Hotel Reviews // GeoTags // Dinner Booking
OPEN TOURISM DAYS

Define

In this chapter, the target groups will be further specified by means of using Personas and creating a Facilitator Profile. The personas will be put in context using Scenarios.

Personas

"Personas" is a tool that represents a target group in terms of the different traits they might have, as well as to provide different perspectives about a service. Stickdorn and Schneider state that by using personas it is possible to "*define and engage the different interest groups that may exist within their target market*" (Stickdorn & Schneider, 2015, pp. 178-179).

In the case of the ODL Platform's two target groups, consideration was given to define the group "facilitators". However, observing the characteristics of the facilitator team at the hackathon and the issues found in this particular area, it can be concluded that a "facilitator" looks more like a profile or a job description than a persona, with respect of the skillset that a facilitator should have.

There is a broader range within the group "participants" and focus was given to give further definition to this group. Therefore, 3 personas were created drawn from inspiration from actual participants and external stakeholders who took part at Hack Integration. The characteristics of each persona are derived from qualitative and quantitative data collected at the hackathon event.

FACILITATOR PROFILE

As a facilitator it is your task to assist the teams in using the ODL Platform if they get stuck during the hackathon. To fulfill that task, you should:

- Have good command of how the ODL Platform works, how to navigate through it to find the tools and templates
- Understand how the templates and tools the Platform is equipped with work, so as to be able to provide guidance to the teams if need be
- Actively engage with the participant teams[9]

Prior to the hackathon, it is recommended that you have some data skills, in particular regarding making sure that the datasets are operable and in the correct format, how to upload datasets and make them available on the Platform[10].

9 Participant Feedback and Hackathon Crew Evaluation

10 Interview with Dataproces, Appendix 1

Lise

"I have ideas for apps but no technical skills to make them happen"

Age: 40
Location: Vanløse
Archetype: "The problem owner"

Tech skills

Beginner **Expert**

Data skills

Beginner **Expert**

Bio

Lise has an administrative position at a small company and on her spare time she volunteers at an NGO that help several causes. Through this volunteering opportunity she has acquired first-hand knowledge on various issues, and she gets ideas for solutions to these issues often.

Lise heard about open data at an event where she helped out with practical tasks. Inspired by the possibilities of open data, she thinks that it could be an important element in the solutions she wants to create.

Motivation

- She has identified a few problem areas she wants to get involved
- Her knowledge and her ability to come up with ideas for solutions to these problem areas
- She wishes to use open data as an important element for her ideas

Frustrations

- Lack of technical skills to make her ideas reality
- Not much knowledge about how to use open data

Niels

"I want to make apps that are useful to society"

Age: 27
Location: Copenhagen
Archetype: "The expert coder"

Tech skills

Beginner **Expert**

Data skills

Beginner **Expert**

Bio

Niels works as a programmer at a startup. When he was studying he participated in several hackathons and while he had fun and learned a lot, he felt that the concepts he has created solved "luxury problems". Therefore he wishes to code something more useful.

One of the newsletters he receives had an article about the rise in popularity of open data and since them he has been learning about it. He quickly understands the potential that open data can have.

Motivation

- He wants to create solutions that can solve real problems
- He wishes to use open data as a core element in his solutions
- He wants to introduce open data at his startup as a mean to create economic value and to gain competitive advantage

Frustrations

- The concepts he has created in hackathons so far are more idealistic than practical

Allan

"I have open datasets but I don't know what to do with them"

Age: 35
Location: Amager
Archetype: "The data owner"

Tech skills

Beginner **Expert**

Data skills

Beginner **Expert**

Bio

Allan is a consultant at a company that makes and sells big data datasets for marketing purposes. These are usually derived from open and public data and market research. He does not work directly with them, but he has easy access to a range of open datasets.

He can program at a basic level and he has taught himself to visualize data and more recently he has been learning to clean existing datasets and to scrape data using browser plugins.

Motivation

- He wants to take his learning further by creating apps based on the data he has
- He wishes his available data to be used for solving needs or for business purposes

Frustrations

- He does not know which problems he can solve with the data that he has at hand, or how to figure out ideas to use the data for a good purpose

Scenarios

Scenarios are hypothetical stories created with the intention of exploring a particular aspect of a service (Stickdorn & Schneider, 2015, pp. 184-185).

After creating the personas, they were put in scenarios that are centered around the ODL Platform and how the personas could use it and benefit from it. In addition, from the scenarios it was possible to derive a list of potential features that the Platform could have for the action to be fulfilled, thus aiding the personas in accomplishing their goals.

Although scenarios are meant to be hypothetical, they were created to be as realistically as possible, partly drawing inspiration from experiences at participating in and being part of the team organizing hackathons.

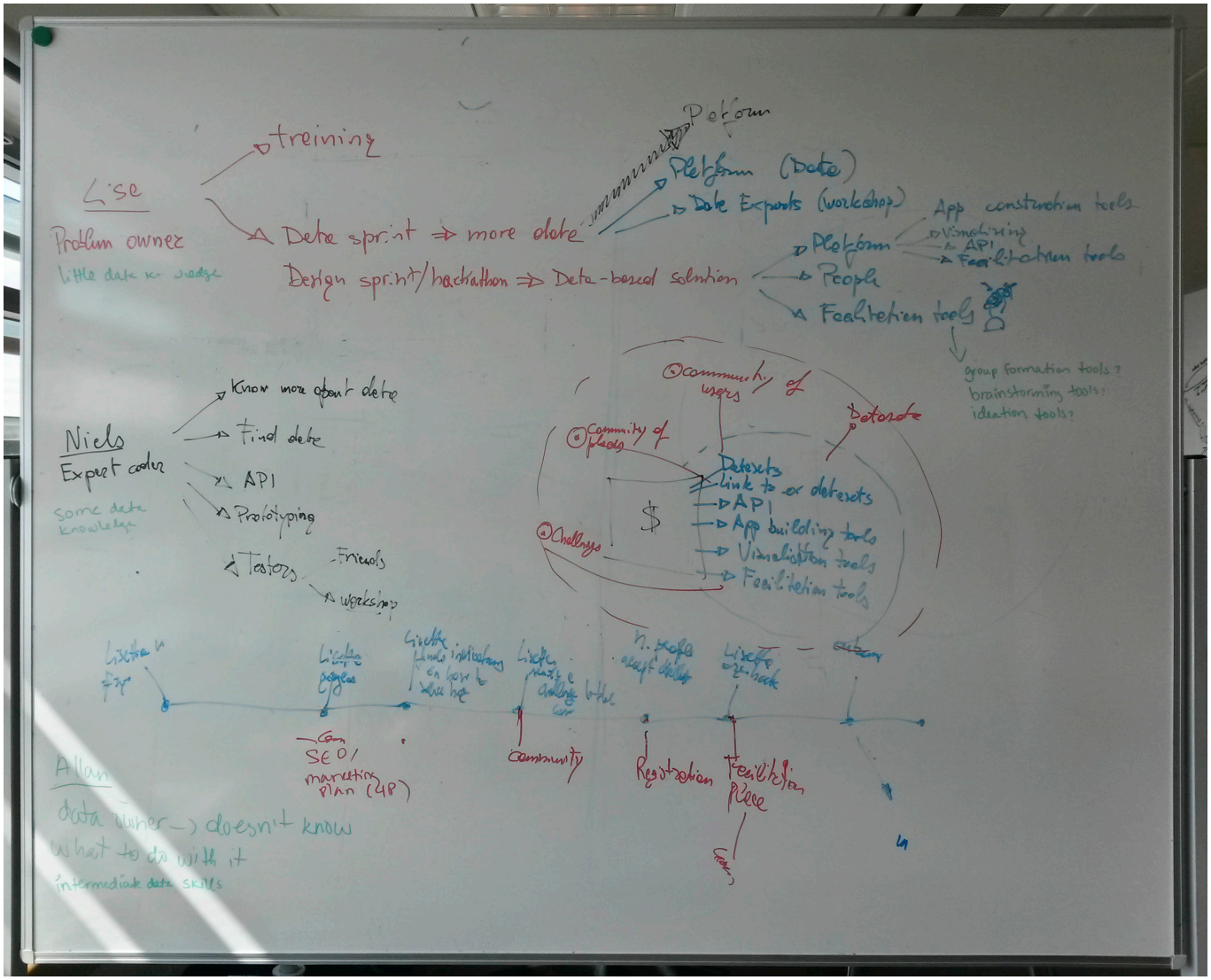
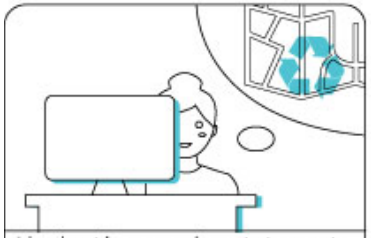


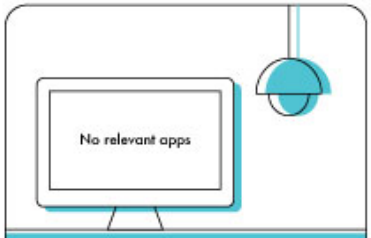
Fig. 13. Brainstorming scenarios.

Independent Context: Lise



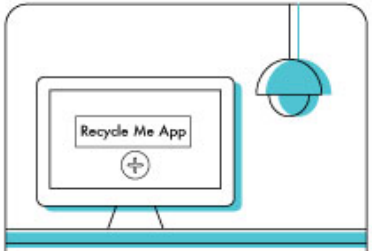
Lise is at home and wants to create a recycling app that shows on a map the nearest containers and the type of containers (e.g. glass, cardboard, paper). At an event she learned about the ODL Platform and visits it.

Her starting point is to see if a similar idea has been created, so **she goes to the app catalog and searches for it**.

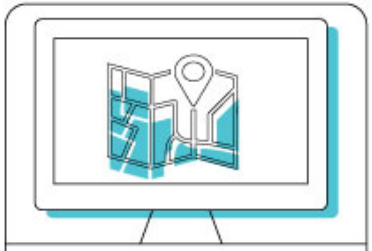


The search results show that no such app is listed, so to begin with **she reads the information about open data**.

She searches for datasets related to her idea and finds some.

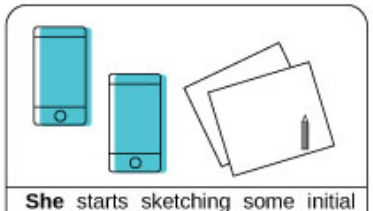


She registers on the Platform and creates a new project "Recycle Me App", where she can save the datasets she found.



The next day **she begins by visualizing the data**. She takes the dataset about container location and type and **uses the Map tool** to visualize it, **after following the tutorial**.

Visualizing this dataset inspires her to shape her idea further in terms of the functionality she can add to her idea: sort the containers by type and whether they are full or not. **She adds a note** with these 2 features **to her current project** on the Platform.



She starts sketching some initial app interfaces and interactions on paper and **proceeds to see which app construction tools she can use** to easily make these paper screens into a digital mock-up, but she finds that the tools available on the ODL Platform are not easy for her skill level.

Therefore, with a concrete idea, an initial user interface, and a list of features, **she goes to the forum to ask for 2 or 3 people who can help her** create an attractive interface and program the app.

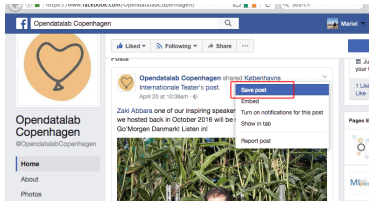
Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Her starting point is to see if a similar idea has been created, so **she goes to the app catalog and searches for it**.	App/idea catalog	No	• Citadel on the Move • Publicdata.eu (feature not operational) • http://www.opendata.dk/viden-om/use-cases	Yes. • It is a way to promote the solutions that have been created using open data • It gives inspiration about what can be done with open data • Proof of concept for the ODL Platform
	Search function	Yes, but not for this purpose		Yes. • To provide an easy way to get search results without having to browse through several pages
The search results show that no such app is listed, so to begin with **she reads the information about open data**.	Build Insights > Information about open data	Yes	Many websites, for example: • http://theodi.org/what-is-open-data • http://opendatahandbook.org/guide/en/what-is-open-data/ • https://ec.europa.eu/digital-single-market/en/open-data	Yes. • The information contains all the basics in one place, written with a simple language that everyone can understand • It is the starting point for data non-experts to learn about data • It could be one starting point for citizens to get familiar with the ODLP

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?

She searches for datasets related to her idea and finds some.	Datasets	Yes	• Citadel on the Move
			• Publicdata.eu
			• Many other dataset repositories, for example:
			  • http://data.kk.dk/
			  • http://portal.opendata.dk/
				Yes.
				• Convenient for citizens to have the basic items that they need in one place
				However, the Platform could link to external repositories.

	Search function	No	• Citadel on the Move
			• Publicdata.eu (feature not operational)
			• Many other dataset repositories, for example:
			  • http://data.kk.dk/
			  • http://portal.opendata.dk/
				Yes.
				• To provide an easy way to find the desired dataset without having to browse several pages in the repository

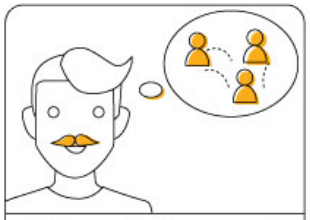
She registers on the Platform and creates a new project "Recycle Me App", where she can save the datasets she found.	Registration/create profile	No	• Citadel on the Move • Publicdata.eu (feature not operational)	Yes. • To provide a way for citizens to keep track of their work, make calls for contributions on the forums, etc.

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
She registers on the Platform and creates a new project “Recycle Me App”, where she can save the datasets she found.	Create project	No	• Citadel on the Move (it is called “Create an App”)	Yes. • To provide a way for citizens to keep track of their work • To feed into the app/ idea catalog once the project is finished
	Save dataset in project	No	Requirement inspired by the “Save link/video/post” and the “Saved” features on Facebook. 	No. It is not critical to save datasets, since the citizen can search for them. However, • It could give citizens convenience to have the datasets saved on the project instead of searching for them every time they work on the project • It could provide a metric to measure which kind of datasets are popular

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
The next day **she begins by visualizing the data**. She takes the dataset about container location and type and **uses the Map tool** to visualize it, **after following the tutorial**.	Build Concepts > Map	Yes	• Tableau • Polymaps.org • Geocharts at Google Charts • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • For citizens to gain a better understanding of data that have geographic information using maps
	Possibility to visualize the citizen's saved datasets	No	No substitutes found.	No, but • It could give citizens convenience to have the relevant datasets saved on the project instead of searching for them every time they work on the project
	Tutorial for using the Map tool	Yes	• Tableau • Geocharts at Google Charts • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • It is a tool to learn how to visualize data that can be shown on a map
Visualizing this dataset inspires her to shape her idea further in terms of the functionality she can add to her idea: sort the containers by type and whether they are full or not. **She adds a note** with these 2 features **to her current project** on the Platform.	Create project > add notes	No	• Publicdata.eu, where users can make notes on datasets (feature not operational). • Basecamp > Notes can be created on "To do" items	No, although this could be a "nice to have" feature that could complement project work by providing a place where to write relevant ideas about the project.

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
She starts sketching some initial app interfaces and interactions on paper and **proceeds to see which app construction tools she can use** to easily make these paper screens into a digital mock-up, but she finds that the tools available on the ODL Platform are not easy for her skill level.	Build App > Balsamiq or AppSpotr (The ODL Platform should divide the current offering in categories, for ex. App construction tools, APIs, etc.)	Yes	Several websites and apps, such as: • Marvel App • Sketch • Invision • Proto.io • Gliffy.com	Yes. • Different tools have different learning curves and provide different UI packages • Participant feedback suggests the ODL Platform should integrate more tools, however it should be investigated which tools might be relevant
Therefore, with a concrete idea, an initial user interface, and a list of features, **she goes to the forum to ask for 2 or 3 people who can help her** create an attractive interface and program the app.	Forum	No	Several forums, such as: • https://opendata.stackexchange.com/ • https://stackoverflow.com/questions/tagged/opendata • https://opendatacommunity.slack.com • Citadel on the Move (it does not have a lot of activity)	Yes. • To give an in-platform tool to connect like-minded citizens who can help each other with the projects, instead of going to multiple places to do different things

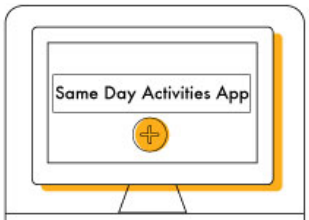
Independent Context: Niels



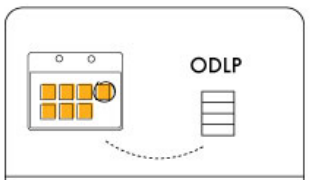
Niels has an idea for a "same day activities" app to connect different kinds of people, especially newcomers to the city.

He starts by making a list of possible features, an initial app flow and low fidelity sketches of the UI (app screens). Through a newsletter he learned about the ODL Platform, which he checks out.

He searches for datasets about activities and the location of culture houses and other public spaces, which are the initial datasets he thinks of. He could only find the ones about the location of the culture houses and public spaces.



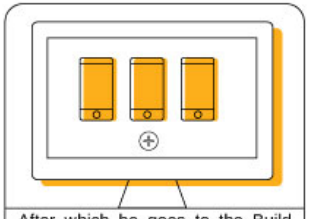
He registers, creates a project "Same Day Activities App" **and saves the found datasets** there.



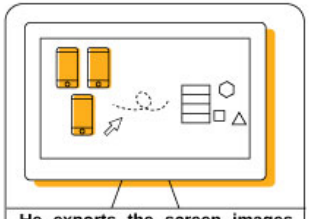
Since he is missing data about the activities, he decides to go to some of the culture houses' websites and downloads some of the event calendars. **He makes a dataset with the information found and uploads it** to the ODLP platform.

He uses the built-in option to check datasets, in order to make sure that his data is operable, and then saves it to his project.

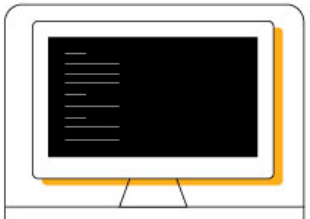
He visualizes the dataset about the location of places **using the Map tool**.



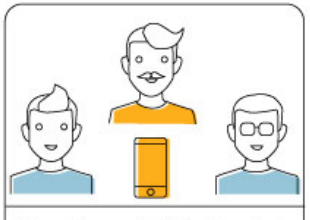
After which he goes to the Build App section, where h**e first proceeds to use one of the app mock-up construction tools** where he makes high fidelity prototypes of the screens.



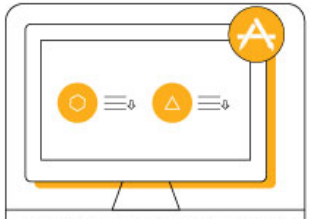
He exports the screen images from this mock-up tool **and uploads them** to his project on the ODL Platform. When he is finished, **he finds an API for maps** on the Build Apps section.



He codes the app using his preferred coding tools, the datasets and the API.



When the app is finished to a beta version, he tests it with friends.



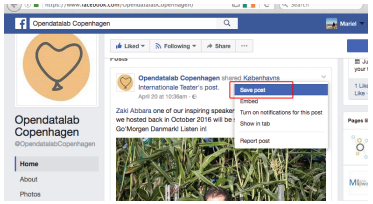
When the corrections are in place, **he** releases it to the app stores and **publishes it on the ODL Platform, where it will be part of the app catalog**.

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?

He searches for datasets about activities and the location of culture houses and other public spaces, which are the initial datasets he thinks of. He could only find the ones about the location of the culture houses and public spaces.	Datasets	Yes	• Citadel on the Move
			• Publicdata.eu
			• Many other dataset repositories, for example:
			  • http://data.kk.dk/
			  • http://portal.opendata.dk/
				Yes.
				• Convenient for citizens to have the basic items that they need in one place
				However, the Platform could link to external repositories.

	Search function	No	• Citadel on the Move
			• Publicdata.eu (feature not operational)
			• Many other dataset repositories, for example:
			  • http://data.kk.dk/
			  • http://portal.opendata.dk/
				Yes.
				• To provide an easy way to find the desired dataset without having to browse several pages in the repository

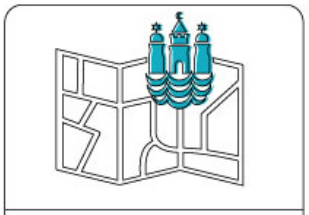
He registers, creates a project "Same Day Activities App" **and saves the found datasets** there.	Registration/create profile	No	• Citadel on the Move • Publicdata.eu (feature not operational)	Yes. • To provide a way for citizens to keep track of their work, make calls for contributions on the forums, etc.
	Create project	No	• Citadel on the Move (it is called "Create an App")	Yes. • To provide a way for citizens to keep track of their work • To feed into the app/ idea catalog once the project is finished

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
He registers, creates a project "Same Day Activities App" **and saves the found datasets** there.	Save dataset in project	No	Requirement inspired by the "Save link/video/post" and the "Saved" features on Facebook. 	No. It is not critical to save datasets, since the citizen can search for them. However, • It could give citizens convenience to have the datasets saved on the project instead of searching for them every time they work on the project • It could provide a metric to measure which kind of datasets are popular
Since he is missing data about the activities, he decides to go to some of the culture houses' websites and downloads some of the event calendars. **He makes a dataset with the information found and uploads it** to the ODL Platform.	Upload dataset	No	Citadel on the Move	Yes, as a way to support crowdsourced datasets.
He uses the built-in option to check datasets, in order to make sure that his data is operable, and then saves it to his project.	"Check dataset" option	No	Citadel on the Move	Yes. • It could be a tool for citizens to verify that crowdsourced datasets have all the relevant details in the correct order/places

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
He visualizes the dataset about the location of places **using the Map tool**,	Build Concepts > Map	Yes	• Tableau • Polymaps.org • Geocharts at Google Charts • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • For citizens to gain a better understanding of data that have geographic information using maps
After which he goes to the Build App section, where **he first proceeds to use one of the app mock-up construction tools** where he makes high fidelity prototypes of the screens.	Build App > Balsamiq or AppSpotr (The ODL Platform should divide the current offering in categories, for ex. App construction tools, APIs, etc.)	Yes	Several websites and apps, such as: • Marvel App • Sketch • Invision • Proto.io • Gliffy.com	Yes. • Different tools have different learning curves and provide different UI packages • Participant feedback suggests the ODL Platform should integrate more tools, however it should be investigated which tools might be relevant
He exports the screen images from this mock-up tool **and uploads them** to his project on the ODL Platform. When he is finished, **he finds an API for maps** on the Build Apps section.	Upload pictures to project	No	• Citadel on the Move (when creating apps) • http://planet.globalservicejam.org	Yes. • To have all the project-related material in one place and to keep track of the citizen's work

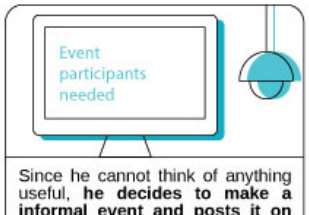
Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
He exports the screen images from this mock-up tool **and uploads them** to his project on the ODL Platform. When he is finished, **he finds an API for maps** on the Build Apps section.	Map API (or external links to some map APIs)	No	• Google Maps API • OpenStreetMap • Microsoft Bing Maps • Foursquare API • Carto.com	Yes. • To allow the creation of solutions that require maps for the service proposition
When the corrections are in place, **he** releases it to the app stores and **publishes it on the ODL Platform, where it will be part of the app catalog**.	"My apps" in the user profile	No	• Citadel on the Move • Publicdata.eu (presumed, feature not operational)	Yes. • To provide a way for citizens to keep track of their finished apps • To feed into the app/ idea catalog
	App/idea catalog	No	• Citadel on the Move • Publicdata.eu (feature not operational) • http://www.opendata.dk/viden-om/use-cases	Yes. • It is a way to promote the solutions that have been created using open data • It gives inspiration about what can be done with open data • Proof of concept for the ODL Platform

Independent Context: Allan, Lise, Niels and others

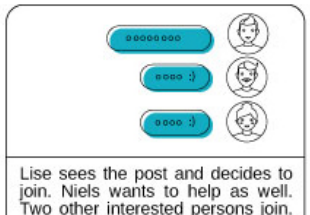


Allan has come in possession of a dataset about public works in the city of Copenhagen. He wants to build a solution with it but has no idea what.

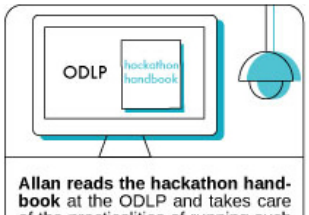
Through his company **he has discovered the ODL Platform and has used it to learn about data**.



Since he cannot think of anything useful, **he decides to make a informal event and posts it on the forum. He seeks to form a group** of no more than 5 people including himself, who can help him make sense of his data and especially someone who can program.

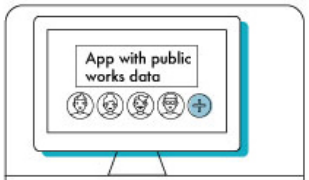


Lise sees the post and decides to join. Niels wants to help as well. Two other interested persons join. **Allan creates a private group conversation** where they agree that Allan will be the facilitator of the event and will find a suitable place to work.



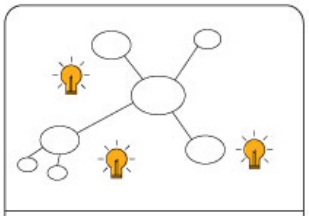
Allan reads the hackathon handbook at the ODLP and takes care of the practicalities of running such an event. He books a work room at a public library, where they can get free wifi and they can bring some refreshments.

He prints a full copy of the Citizen Data Toolkit (CDT) since he is unsure of which tools will be useful for his purpose.

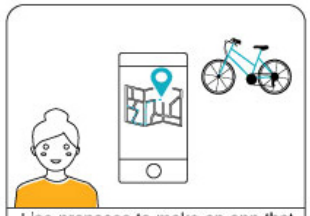


The work group agrees on a date to meet. **Allan** then **creates a new project** "App with public works data" **and adds all the interested people in the work group**, so that the finished product can appear in their profiles.

The work group meets and **Allan shows them the data** he has **using the Graphicly tool**.



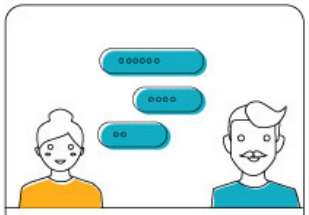
Using the Brainstorming Tool, they come up with several ideas.



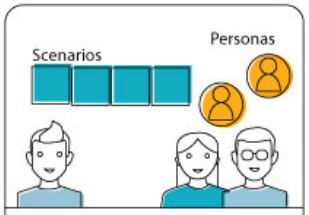
Lise proposes to make an app that can inform citizens of whether there are public works being done in their preferred routes from for ex. home to work, work to gym, home to school, etc.

Another team member builds upon Lise's idea by adding a feature to connect to the real-time info provided by the Rejseplanen API, thus giving app users options for public transportation.

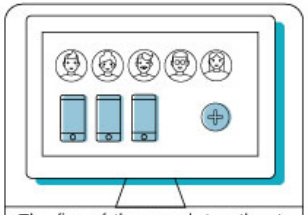
Everyone likes this idea, so **they further define it using the Need Definition Tool**; they devise a work plan, which **Allan adds in a note on their group project**.



The work group reconvenes the next day to start working. Lise and Niels discuss the feasibility of the features of the app.

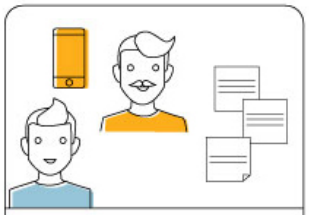


Allan and the other participants create personas and scenarios for the usage of the app using the Persona and the Scenario Tools.

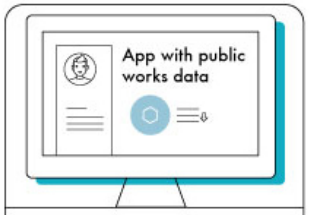


The five of them work together to create the user interface from the scenarios and the features. **Paper sketches are produced, photographed and uploaded to the group project**.

While Niels works on **making an interactive high fidelity mock-up with Marvel App**, the rest of **the group plans the testing of the app** using the Prototype Testing Tool.



They test the app with library users, gather their findings and prioritize the found issues to tweak before Niels programs a first version.



When the app is launched, **a link to it will appear on everybody's profiles and the app catalog**.

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Through his company **he has discovered the ODL Platform and has used it to learn about data**.	Build Insights > Information about open data	Yes	Many websites, for example: • http://theodi.org/what-is-open-data • http://opendatahandbook.org/guide/en/what-is-open-data/ • https://ec.europa.eu/digital-single-market/en/open-data	Yes. • The information present at the ODL Platform contains all the basics in one place, written with a simple language that everyone can understand • It is the starting point for data non-experts to learn about data • It could be one starting point for citizens to get familiar with the ODLP
	Build Concepts > Map and Graphicly	Yes	• Tableau • Polymaps.org • Google Charts • Carto.com • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • Different kinds of datasets need different tools to visualize them • Visualizing datasets can help understanding them and inspiring ideas for solutions

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Since he cannot think of anything useful, **he decides to make an informal event and posts it on the forum. He seeks to form a group** of no more than 5 people including himself, who can help him make sense of his data and especially someone who can program.	Forum	No	Several forums, such as: • https://opendata.stackexchange.com/ • https://stackoverflow.com/questions/tagged/opendata • https://opendatacommunity.slack.com • Citadel on the Move (it does not have a lot of activity)	Yes. • To give an in-platform tool to connect like-minded citizens who can help each other with the projects, instead of going to multiple places to do different things
	Team building tool	No	No substitutes found because team building is preferred to be done manually for a better distribution of skills in a group.	A tool as such is not necessary, but the ODL Platform could include some tips for team building, as this is an important step when organizing co-design events.
Lise sees the post and decides to join. Niels wants to help as well. Two other interested persons join. **Allan creates a private group conversation** where they agree that Allan will be the facilitator of the event and will find a suitable place to work.	Chat options	No	• Skype • Facebook Messenger • Private chat options on Slack Forums	No, but it could be a “nice to have” feature. • To give an in-platform tool to privately talk to team members, instead of going to multiple places to do different things • To organize team-related work

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Allan reads the hackathon handbook at the ODL Platform and takes care of the practicalities of running such an event. He books a work room at a public library, where they can get free wifi and they can bring some refreshments.	Hackathon handbook	Yes	Articles in various websites, such as: • http://hackdaymanifesto.com/ • https://medium.com/tech-innovation-products/hacking-the-hackathon-40c109c1a6ea • https://socrata.com/open-data-field-guide/how-to-run-a-hackathon/	Yes. • To give practical tips and guidelines for running co-design events • To give guidance about the tools included in the ODL Platform and the Platform itself
He prints a full copy of the Citizen Data Toolkit (CDT) since he is unsure of which tools will be useful for his purpose.	CDT	Not yet	• http://www.servicedesigntoolkit.org/downloads.html	Yes. • To provide citizens with a tool package specific to each phase of the co-design events and that can also support individual creativity • To enhance the ODL Platform's value proposition

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
The work group agrees on a date to meet. **Allan** then **creates a new project** "App with public works data" **and adds all the interested people in the work group**, so that the finished product can appear in their profiles.	Create project	No	• Citadel on the Move (it is called "Create an App")	Yes. • To provide a way for citizens to keep track of their work • To feed into the app/ idea catalog once the project is finished
	Create team	No	• http://planet.globalservicejam.org	Yes. • To organize the work group in-platform • As a way for team members to start to know about each other
	Add team members	No		
The work group meets and **Allan shows them the data** he has **using the Graphicly tool**.	Build Concepts > Graphicly	Yes	• Tableau • Google Charts • Microsoft Excel • Fusion Tables (https://sites.google.com/site/fusiontablestalks/)	Yes. • For citizens to gain a better understanding of (statistical) data using a visual representation in charts
Using the Brainstorming Tool, they come up with several ideas.	Brainstorming Tool	Not yet	• Mind mapping templates such as the one on lucidchart.com or gliffy.com • Post-its and other analog media	Yes. • To aid brainstorming and idea generation, especially in case the group does not know where to begin

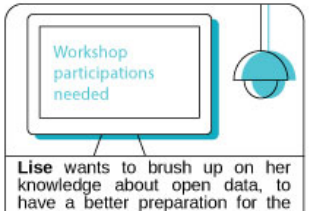
Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Everyone likes this idea, so **they further define it using the Need Definition Tool**; they devise a work plan, which **Allan adds in a note on their group project**.	Need Definition Tool	Not yet	No specific substitutes found to define needs, but there are several methods to define problems/issues.	Yes. • To aid having a focused discussion about the need(s) that the solution to be created will address
	Create project > add notes	No	• Publicdata.eu, where users can make notes on datasets (feature not operational). • Basecamp > Notes can be created on “To do” items	No, although this could be a “nice to have” feature that could complement project work by providing a place where to write relevant ideas about the project.
Allan and the other participants create personas and scenarios for the usage of the app using the Personas and the Scenario Tools.	Persona Tool	No	• https://xtensio.com/ • Persona templates at http://www.servicedesigntoolkit.org/downloads.html	Yes. • To give further definition to the target group of a project • To gain empathy about the possible motivation and frustrations of the target group

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Allan and the other participants create personas and scenarios for the usage of the app using the Personas and the Scenario Tools.	Scenario Design Tool	Not yet	• Twine (http://twinery.org/) • Post-its and other analog media to write and draw on	Yes. • To explore specific service/solution aspects from the point of view of the target group • To enable citizens to gain understanding about how the target group could use the service/solution and how they could benefit from it
The five of them work together to create the user interface from the scenarios and the features. **Paper sketches are produced, photographed and uploaded to the group project**.	Upload pictures to project	No	• Citadel on the Move (when creating apps) • http://planet.globalservicejam.org	Yes. • To have all the project-related material in one place and to keep track of the citizen's work
While Niels works on making **an interactive high fidelity mock-up with Marvel App**, the rest of **the group plans the testing of the app** using the Prototype Testing Tool.	Marvel App to be on the list of app construction tools	No	• Other software to build interactive high fidelity mock-ups, such as: • Invision • Axure • Proto.io	Yes. • Marvel App allows non-coders to create interactive apps without coding (clicks on links, clicks on buttons, etc.)

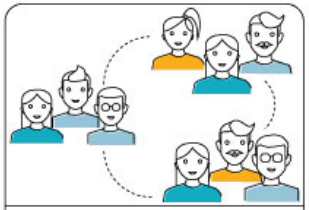
Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
While Niels works on making **an interactive high fidelity mock-up with Marvel App**, the rest of **the group plans the testing of the app** using the Prototype Testing Tool.	Prototype Testing Tool	Not yet	• Prototype templates at http://www.servicedesigntoolkit.org/downloads.html • Specific test templates, such as the usability test template at http://www.userfocus.co.uk/articles/usability_test_plan_dashboard.html	Yes. • To provide guidance on what to test, which is especially useful for citizens with limited technical skills
When the app is launched, **a link to it will appear on everybody's profiles and the app catalog**.	"My apps" in the user profile	No	• Citadel on the Move • Publicdata.eu (presumed, feature not operational)	Yes. • To provide a way for citizens to keep track of their finished apps • To feed into the app/idea catalog
	App/idea catalog	No	• Citadel on the Move • Publicdata.eu (feature not operational) • http://www.opendata.dk/viden-om/use-cases	Yes. • It is a way to promote the solutions that have been created using open data • It gives inspiration about what can be done with open data • Proof of concept for the ODL Platform

Co-design Context: Hackathon

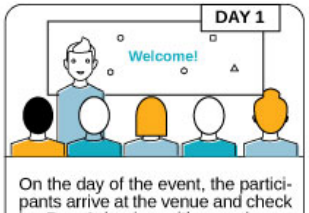
Allan, Lise and Niels have learned about the open data hackathon "Hack 4 Animal Welfare" through different channels. **They** all **log on to the ODL Platform and sign up for the event.**



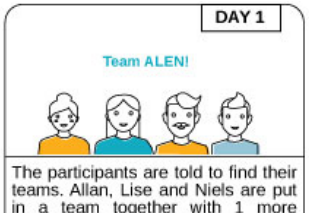
Lise wants to brush up on her knowledge about open data, to have a better preparation for the event, so she **starts reading up on the info available on the Platform. She** also **practices searching for random datasets and visualizing them**, trying to use them to generate ideas.



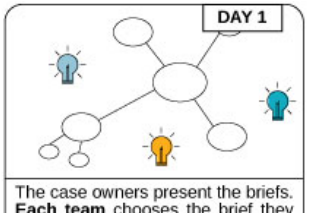
The organizers of the hackathon close the registration and **form multidisciplinary teams.**



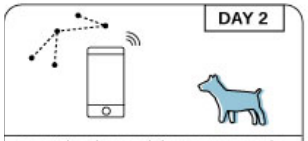
On the day of the event, the participants arrive at the venue and check in. Day 1 begins with a welcome speech and what they as participants can expect to happen during the weekend, and also during the day.



The participants are told to find their teams. Allan, Lise and Niels are put in a team together with 1 more person; they introduce themselves and give their newly formed team a name "ALEN". **The first delivery on the ODL Platform is to create their team, give it a name and join it**.

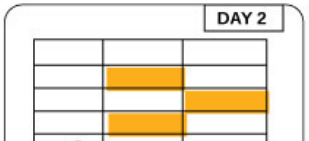


The case owners present the briefs. **Each team** chooses the brief they want to work on and **proceeds with the initial brainstorming using the Brainstorming Tool.** They finish the day identifying a few ideas that they want to work with.



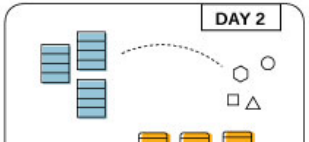
Day 2 begins and the teams continue where they left off. Team ALEN sees potential in making a web app where pet owners can find the nearest animal-related services to their location, show basic information about the businesses and redirect them to their websites or booking services. Users could add businesses that are not on the app.

The next delivery on the Platform is to create a new project "Pet services directory" and **upload pictures of their brainstorming session.**



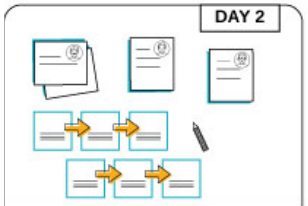
Team ALEN refines the idea using the Need Definition Tool and writing down the key interactions with the service and which data they need.

They go to the ODL Platform and look for relevant datasets: they find the CVR list from where they can find the businesses.

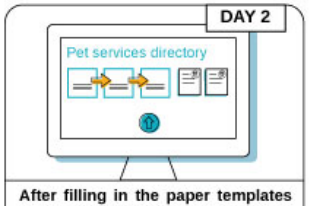


They visualize the dataset they found **using the Map Tool** and start thinking of features for their web app in the making.

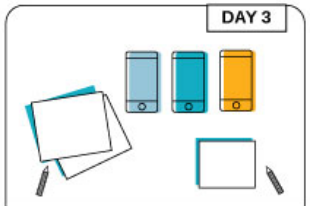
In the middle of the day 2 the organizers hold a status report where the teams show and tell what they have so far, receiving feedback from their peers.



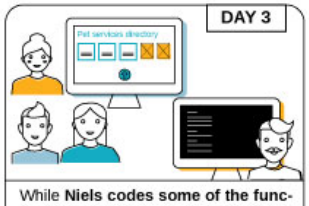
They further **specify the target group by creating personas** with the Persona Tool **and** they **make a customer journey** through the web app using the Customer Journey Canvas.



After filling in the paper templates and agreeing on all the changes they made, **they fill in the templates in-platform and add them to their project.** Before ending the day they decide which part of the service they will prototype the next day.



Day 3 begins with team ALEN diving into making a prototype. **They choose one of the digital mock-up tools** at the App Construction Tools on the ODL Platform to make the user interface.



While **Niels codes some of the functionality of the main feature with a map API** he found on the ODL Platform, **the rest of the team starts preparing their pitch** using the Pitching Tool. They continue to document their process by uploading pictures.

Team ALEN pitches their idea to **the judges**, who **give them good feedback**. They win the second place and are very satisfied with it.

The web app they created is updated with the prototype and it **will be part of the Platform's app catalog.**

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Allan, Lise and Niels have learned about the open data hackathon “Hack 4 Animal Welfare” through different channels. **They** all **log on to the ODL Platform and sign up for the event.**	Tool to sign-up to events	No	• Eventbrite • Hackathon.io	Yes. • To use the ODL Platform as a channel to promote the Open Data Labs’ and O4C’s events
	Login system	No	• Citadel on the Move • Publicdata.eu (feature not operational)	Yes. • To enable citizens to use some of the other tools of the Platform, such as creating projects
Lise wants to brush up on her knowledge about open data, to have a better preparation for the event, so she **starts reading up on the information available on the Platform**. **She** also **practices searching for random datasets and visualizing them**, trying to use them to generate ideas.	Build Insights > Information about open data	Yes	Many websites, for example: • http://theodi.org/what-is-open-data • http://opendatahandbook.org/guide/en/what-is-open-data/ • https://ec.europa.eu/digital-single-market/en/open-data	Yes. • The information present at the ODL Platform contains all the basics in one place, written with a simple language that everyone can understand • It is the starting point for data non-experts to learn about data • It could be one starting point for citizens to get familiar with the ODLP

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Lise wishes to brush up on her knowledge about open data, to have better preparation for the event, so she **starts reading up on the information available on the Platform**. **She** also **practices searching for random datasets and visualizing them**, trying to use them to generate ideas.	Build Concepts > Map and Graphicly	Yes	• Tableau • Polymaps.org • Google Charts • Carto.com • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • Different kinds of datasets need different tools to visualize them • Visualizing datasets can help understanding them and inspiring ideas for solutions
The organizers of the hackathon close the registration and **form multidisciplinary teams**.	Team building tool	No	No substitutes found because team building is preferred to be done manually for a better distribution of skills in a group.	A tool as such is not necessary, but the ODL Platform could include some tips for team building, as this is an important step when organizing co-design events.
The participants are told to find their teams. Allan, Lise and Niels are put in a team together with 1 more person; they introduce themselves and give their newly formed team a name “ALEN”. **The first delivery on the ODL Platform is to create their team, give it a name and join it**.	Create team	No	• http://planet.globalservicejam.org	Yes. • To organize the work group in-platform • As a way for team members to start to know about each other
	Join team	No		

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
The case owners present the briefs. **Each team** chooses the brief they want to work on and **proceeds with the initial brainstorming using the Brainstorming Tool**. They finish the day identifying a few ideas that they want to work with.	Brainstorming Tool	Not yet	• Mind mapping templates such as the one on lucidchart.com or gliffy.com • Post-its and other analog media	Yes. • To aid brainstorming and idea generation, especially in case the group does not know where to begin
The next delivery on the Platform is to create a new project "Pet services directory" **and upload pictures of their brainstorming session.**	Create project	No	• Citadel on the Move (it is called "Create an App")	Yes. • To provide a way for citizens to keep track of their work • To feed into the app/ idea catalog once the project is finished
	Upload pictures to project	No	• Citadel on the Move (when creating apps) • http://planet.globalservicejam.org	Yes. • To have all the project-related material in one place and to keep track of the citizen's work
Team ALEN refines the idea using the Need Definition Tool and writing down the key interactions with the service and which data they need.	Need Definition Tool	Not yet	No specific substitutes found to define needs, but there are several methods to define problems/issues.	Yes. • To aid having a focused discussion about the need(s) that the solution to be created will address

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?

They go to the ODL Platform and looks for relevant datasets: they find the CVR list from where they can find the businesses.	Search function	No	• Citadel on the Move
			• Publicdata.eu (feature not operational)
			• Many other dataset repositories, for example:
			  • http://data.kk.dk/
			  • http://portal.opendata.dk/
				Yes.
				• To provide an easy way to find the desired dataset without having to browse several pages in the repository

They visualize the dataset they found **using the Map Tool** and start thinking of features for the platform.	Build Concepts > Map	Yes	• Tableau • Polymaps.org • Geocharts at Google Charts • Fusion Tables by Google (https://sites.google.com/site/fusiontablestalks/)	Yes. • For citizens to gain a better understanding of data that have geographic information using maps
They further **specify the target group by creating personas** with the Persona Tool **and** they **make a customer journey** through the web app using the Customer Journey Canvas.	Persona Tool	No	• https://xtensio.com/ • Persona templates at http://www.servicedesigntoolkit.org/downloads.html	Yes. • To give further definition to the target group of a project • To gain empathy about the possible motivation and frustrations of the target group

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
They further **specify the target group by creating personas** with the Persona Tool **and they make a customer journey** through the web app using the Customer Journey Canvas.	Customer Journey Canvas	No	• https://canvanizer.com/new/customer-journey-canvas	Yes. • For citizens to learn how users navigate through the service
After filling in the paper templates and agreeing on all the changes they made, **they fill in the templates in-platform** and add them to their project. Before ending the day they decide which part of the service they will prototype the next day.	Digital templates in-platform	No	• Citadel on the Move	Yes. • To give citizens an option to work directly in-platform
	Templates available for printing	No	• Various templates at http://www.servicedesigntoolkit.org/downloads.html	Yes. • It is easier and quicker to fill in and adjust the work when using printed materials • To use the templates in cases of technical problems with the internet

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Day 3 begins with team ALEN diving into making a prototype. **They choose one of the digital mock-up tools** at the App Construction Tools on the ODL Platform to make the user interface.	Build App > Balsamiq or AppSpotr (The ODL Platform should divide the current offering in categories, for ex. App construction tools, APIs, etc.)	Yes	Several websites and apps, such as: • Marvel App • Sketch • Invision • Proto.io • Gliffy.com	Yes. • Different tools have different learning curves and provide different UI packages • Participant feedback suggests the ODL Platform should integrate more tools, however it should be investigated which tools might be relevant
While **Niels codes the functionality of the main feature with a map API** he found on the ODL Platform, **the rest of the team starts preparing their pitch** using the Pitching Tool.	Map API (or external links to some map APIs)	No	• Google Maps API • OpenStreetMap • Microsoft Bing Maps • Foursquare API • Carto.com	Yes. • To allow the creation of solutions that require maps for the service proposition
	Pitching Tool	No	A tool as such was not found, but there are many websites with different methods and guidelines to structure a pitch.	Yes • To teach citizens how to structure a pitch and which aspects are important

Action	Requirement for the ODL Platform	Is the requirement implemented in the Platform?	Existing substitutes	Is the requirement necessary for the ODL Platform? Why/why not?
Team ALEN pitches their idea to **the judges**, who **give them good feedback**. They win the second place and are very satisfied with it.	Feedback Tool	No	A similar tool has not been found.	Yes. • To help the judges in what to focus on during the pitching sessions • To give concrete feedback to the participants
The web app they created is updated with the prototype and it **will be part of the Platform's app catalog.**	App/idea catalog	No	• Citadel on the Move • Publicdata.eu (feature not operational) • http://www.opendata.dk/viden-om/use-cases	Yes. • It is a way to promote the solutions that have been created using open data • It gives inspiration about what can be done with open data • Proof of concept for the ODL Platform

Sub-conclusion

The scenarios show some ways in which citizens with different technical and data skills can approach learning about and working with open data, both in independent contexts and co-design events, and how the Platform can give them support in reaching their objectives. Furthermore, an initial list of tools and features is revealed, with the intention of complementing the ODLP, not only to be at the same level as the competitors, but also to provide a more complete experience to the citizens who wish to dive into the realm of open data.

Summary

Personas
The ODL Platform's chosen target groups were given further specification by means of using personas.

- For the group "citizens" 3 personas, representing 3 archetypes with a different mix of skills and motivation to learn to use open data, were created. The personas were derived from qualitative and quantitative data from participants and external stakeholders at Hack Integration
- Based on observations of the skillset that the facilitator team had during the hackathon event, the group "facilitators" was deemed to resemble a profile rather than a persona. The definition of this group consisted of a profile with the minimum requirements a facilitator should fulfill

Scenarios
The personas were put in context by creating scenarios.

- Four scenarios were written considering the 2 contexts of usage and how citizens with different skills could use the ODL Platform to learn about and work with open data
- The scenarios show which tools and features could be added to better equip the Platform to provide a fuller experience for its users and to be more competitive

Final Problem Statement

The ODL Platform has been created to be used in contexts of co-design events, as well as independent contexts. Therefore, it should provide suitable tools that can support and be used accordingly in both contexts while achieving the purpose for which it was created.

To that end, the problem statement that will steer the Develop and Deliver phases is:

How might we create a digital Platform that can support both co-design event processes and individual creativity processes in the open data context?

Develop

In this phase, a solution that will attempt to solve some of the issues found earlier will be created. The proposed solution is to restructure the current hackathon event process and to design a suitable similar process for the independent context, as well as complementing said processes with suitable tools and templates. There will be tests of this solution by means of a service walkthrough.

Proposed Solution

The proposed solution has been developed for **citizens with little to no knowledge about open data, regardless of their technical/programming expertise**. It is built around restructuring the hackathon event process, by giving the Pre-Hack, Hackathon and Post-Hack phases dedicated inputs and expected outcomes from the process itself and from the ODL Platform. A similar process for the independent context will be created.

In such process the ODL Platform is given an active role: to be a **facilitation tool** that provides citizens with **step-by-step guidance** in learning about open data and in transforming an initial idea into an open data-based service. The solution also looks into equipping the Platform with relevant tools and templates, in order to achieve the expected outcomes in each phase of the restructured process.

Limitations within the Solution

The following limitations have been set in the development of the proposed solution because of constraints in time and resources.

The solution focuses on the group within the target group who is deemed to have the most to gain from using a platform like this one. Consideration was given to designing for the expert users as well, but it has been observed that the experts have their preferred tools and it is likely that said tools include features that the ODL Platform might not be able to provide.

Although they are an important component in the co-design context, a blueprint or wireframes seen from the facilitators' point of view has not been designed. Instead, focus was put into making a profile with the minimum requirements they should fulfill (page 50), making the proposed co-design process as understandable as possible, and some tools in the proposed toolbox are specifically aimed to them.

Co-design Context

Proposed Process

The proposed co-design event process (Fig. 14) has been created as an aid in showing facilitators and organizers the workflow of a co-design event and how the ODL Platform can give them support along the way.

The Pre-Hack Phase is where the stakeholders will shape the theme of the co-design event and create the brief(s) that will be used in the hackathon event. It is here where the criteria for evaluating the ideas will be decided and the format of the Open Data Facilitation Session will be defined.

The Hackathon Phase is where the co-design event takes place and where the Platform is expected to be utilized the most. One important moment in this phase is the Open Data Facilitation Session, which is where the participants will be introduced to the concepts of open data and the data tools. The ideal scenario is that a data expert facilitates this session and provides some small exercises to get familiar with the tools. That said, it is up to the facilitator team and/or the data expert to decide how the session will be organized.

In the Post-Hack Phase activities can be organized based on the needs of the service concepts and the participants' interest in continuing to work on their service ideas to be developed into services with full functionality. As a minimum, the Platform offers a usability testing guide and how to create a business model using the Business Model Canvas.

The process has been created taking inspiration partly from the field research undertaken at the hackathon Open Tourism

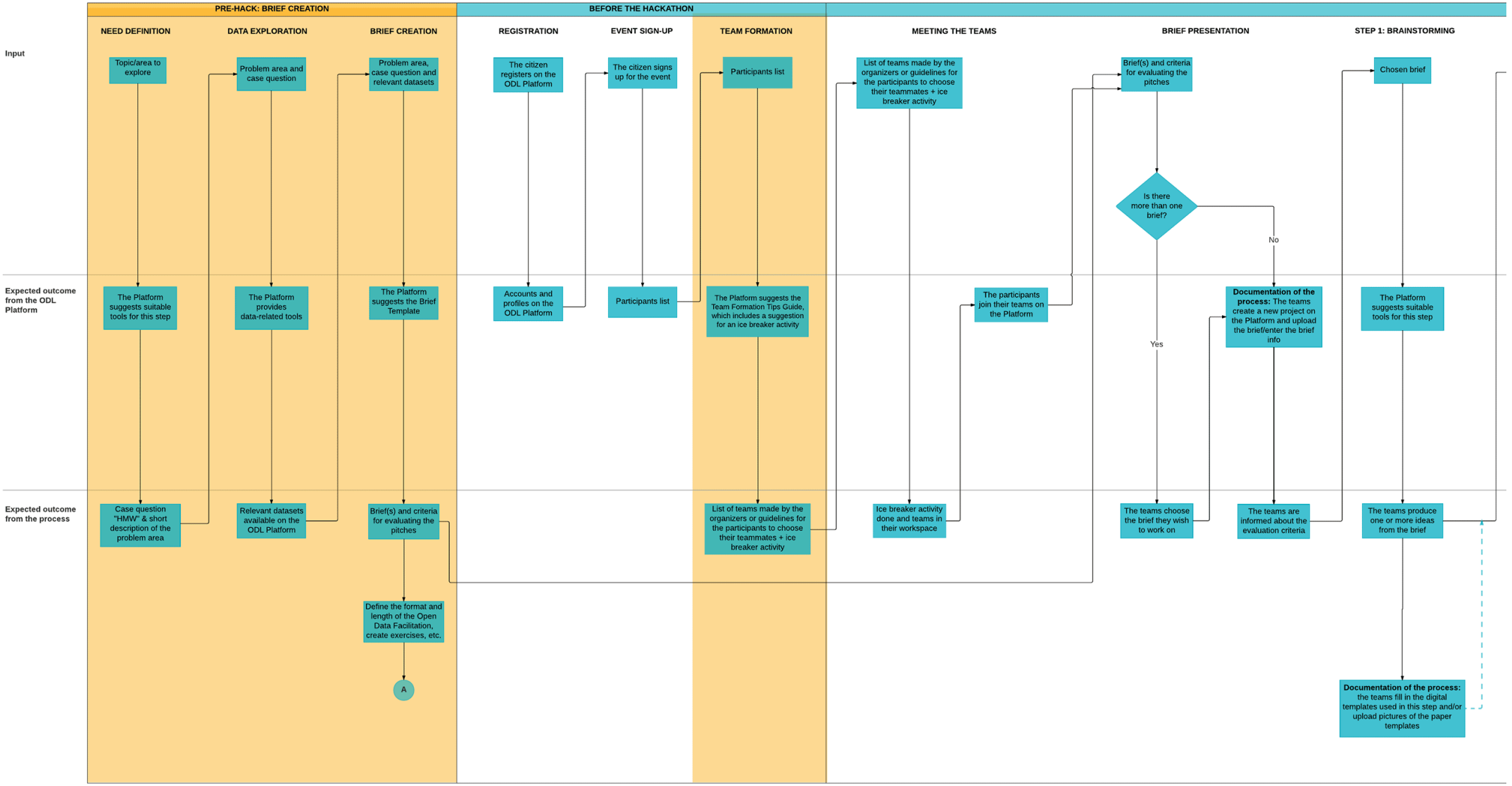
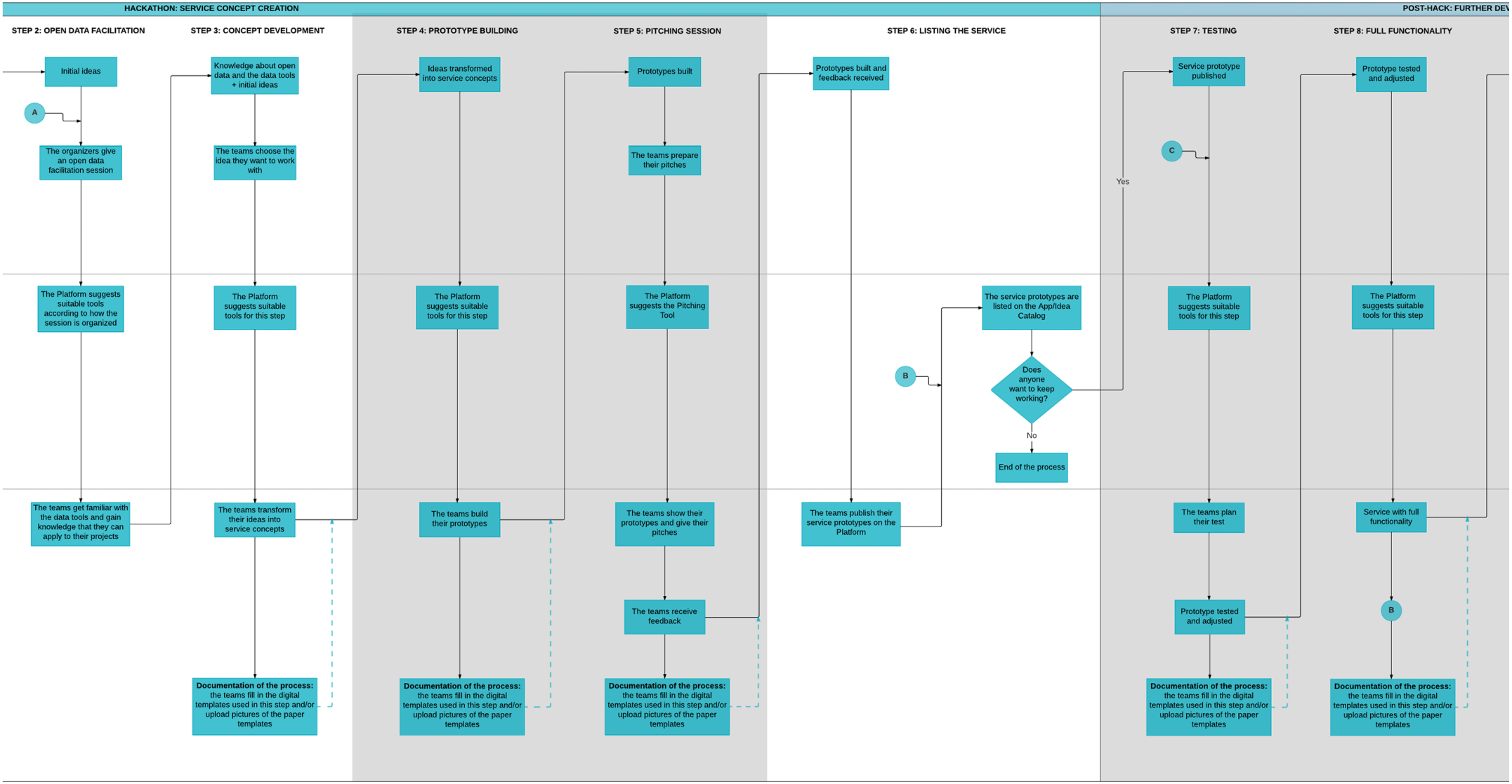

PRE-HACK: BRIEF CREATION
BEFORE THE HACKATHON
NEED DEFINITION
DATA EXPLORATION
BRIEF CREATION
REGISTRATION
EVENT SIGN-UP
TEAM FORMATION
MEETING THE TEAMS
BRIEF PRESENTATION
STEP 1: BRAINSTORMING
Input
Expected outcome from the ODL Platform
Expected outcome from the process
Topic/area to explore
Problem area and case question
Problem area, case question and relevant datasets
The citizen registers on the ODL Platform
The citizen signs up for the event
Participants list
List of teams made by the organizers or guidelines for the participants to choose their teammates + ice breaker activity
Brief(s) and criteria for evaluating the pitches
Chosen brief
Is there more than one brief?
No
Yes
The Platform suggests suitable tools for this step
The Platform provides data-related tools
The Platform suggests the Brief Template
Accounts and profiles on the ODL Platform
Participants list
The Platform suggests the Team Formation Tips Guide, which includes a suggestion for an ice breaker activity
The participants join their teams on the Platform
Documentation of the process: The teams create a new project on the Platform and upload the brief/enter the brief info
The Platform suggests suitable tools for this step
Case question "HMW" & short description of the problem area
Relevant datasets available on the ODL Platform
Brief(s) and criteria for evaluating the pitches
List of teams made by the organizers or guidelines for the participants to choose their teammates + ice breaker activity
Ice breaker activity done and teams in their workspace
The teams choose the brief they wish to work on
The teams are informed about the evaluation criteria
The teams produce one or more ideas from the brief
Define the format and length of the Open Data Facilitation, create exercises, etc.
A
Documentation of the process: the teams fill in the digital templates used in this step and/or upload pictures of the paper templates
Done without involving (future) hackathon participants
Outside the ODL Platform's scope
Alternative path in the process
Alternative path to document the process if working with paper templates

Fig. 14.

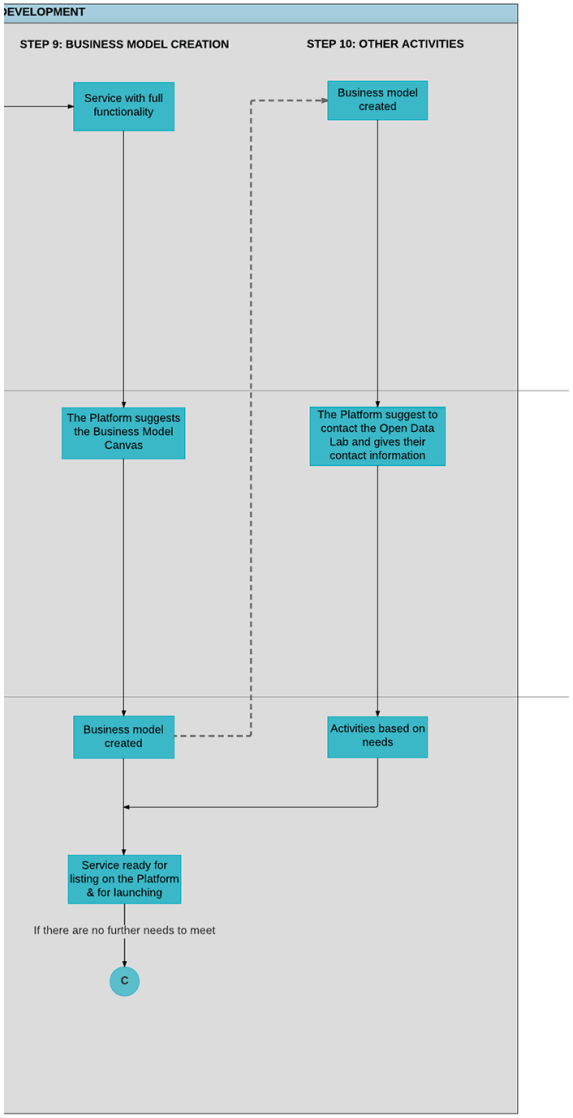


Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates



Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates

Days and from experiences at Hack Integration and at other similar co-design events.

Step-by-Step Guide

The step-by-step guide is the way in which the proposed process will be visualized to the citizen. In this context it is also intended to serve as an aid to the facilitators and organizer team. This guide is designed to have 10 relevant steps for the citizen, which correspond to the steps shown in the proposed process. With each step the guide will provide the necessary tools to accomplish the expected outcomes and point to where they are located on the ODL Platform (Table 4).

The guide provides a flexible structure with respect of the tools, in that the facilitators could choose to leave out tools that do not fit the format of the co-design event they organize. Likewise, the participants can decide whether they wish to use all the tools or skip those that they consider not relevant for their solution.

To read more about the tools, please refer to the section “Proposed Toolbox”.

Fig. 15 shows a selection of wireframes where it can be observed how the guide could be displayed on the ODL Platform and the sought functionality as the citizen clicks through the steps.

Step	Suggested Tools/Templates

Step 0: Brief Creation	• Mind Map
	• Brainstorming Template
	• Need Definition Tool
	• Dataset Repository
	• Data Handling Tools:
	  • Search Dataset
	  • Upload Dataset
	  • Create Dataset
	  • Check Dataset
	• Data Visualization Tools (map and charts)
	• Data Scraping Tools
	• Brief Template

Step 1: Brainstorming	• Brainstorming Template • Dataset Repository • Search Dataset • Data Visualization Tools (map and charts)
Step 2: Open Data Facilitation	• Open Data Introduction • Inspiration Cards • Dataset Repository • Data Handling Tools (the same as in Step 0) • Data Visualization Tools (map and charts) • Data Scraping Tools
Step 3: Concept Development	• Concept Storyboard Template • Data Validation Tool • Dataset Repository • Data Visualization Tools (map and charts) • Data Scraping Tools • Data Handling Tools (the same as in Step 0)

Table 4.

Step	Suggested Tools/Templates
Step 3: Concept Development	• Refine Concept Template • Persona Template • Scenario Tool • Customer Journey Canvas • Stakeholder Map
Step 4: Prototype Building	App Construction Tools • Digital Mock-up Tools • Programming Tools • App Builders • Learning Tools • APIs
Step 5: Pitching Session	• Pitching Tool
Step 6: List the Service	• A button on the ODL Platform to list the service
Step 7: Testing	• Prototype Testing Guide: Usability
Step 8: Full Functionality	• App Construction Tools (the same as in Step 4)
Step 9: Business Model Creation	• Business Model Canvas
Step 10: Other Activities (optional)	• Depends on the activity

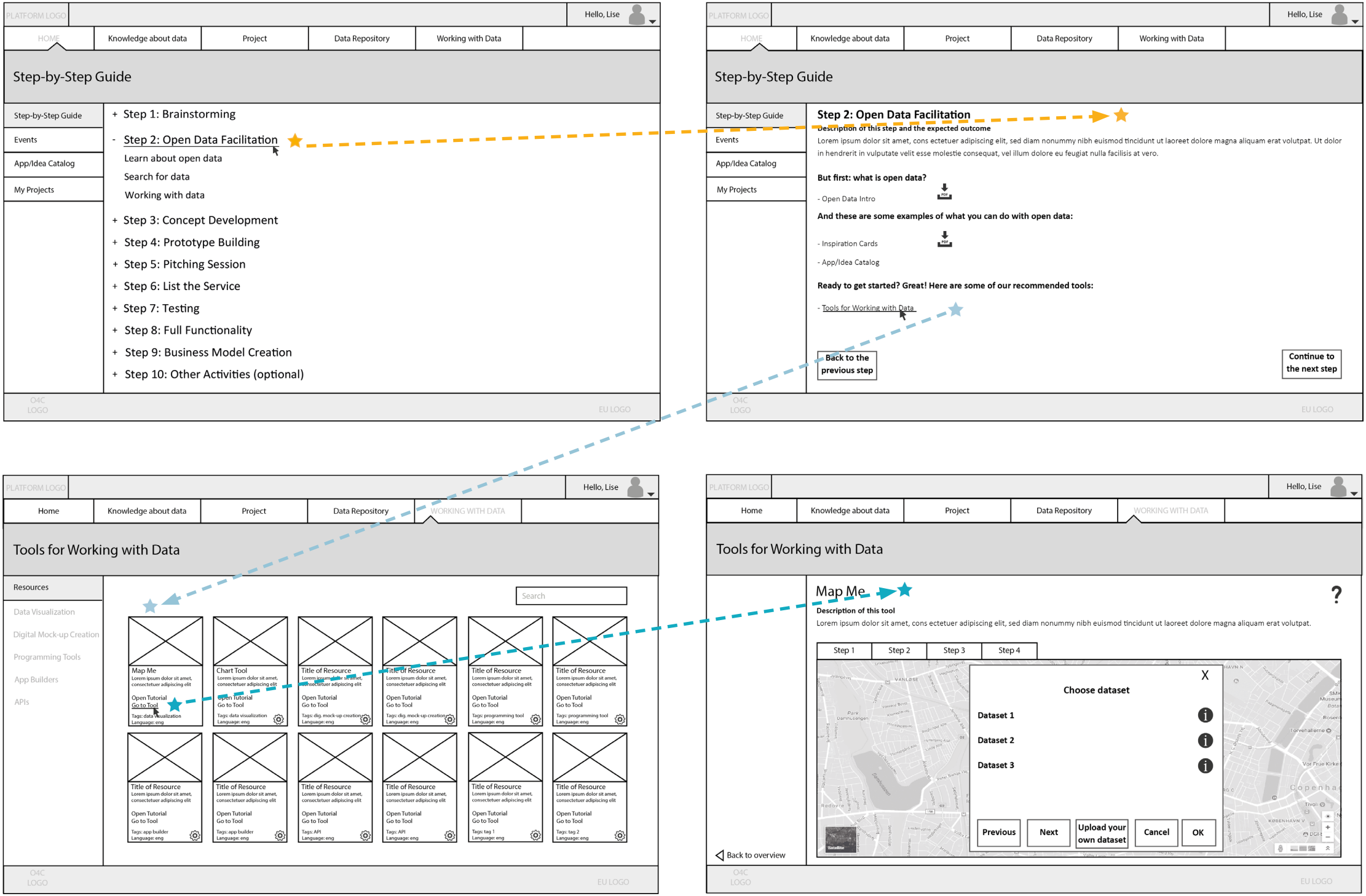

PLATFORM LOGO
Hello, Lise
HOME
Knowledge about data
Project
Data Repository
Working with Data
Step-by-Step Guide
Step-by-Step Guide
Events
App/Idea Catalog
My Projects
+ Step 1: Brainstorming
- Step 2: Open Data Facilitation
Learn about open data
Search for data
Working with data
+ Step 3: Concept Development
+ Step 4: Prototype Building
+ Step 5: Pitching Session
+ Step 6: List the Service
+ Step 7: Testing
+ Step 8: Full Functionality
+ Step 9: Business Model Creation
+ Step 10: Other Activities (optional)
O4C LOGO
EU LOGO
Step 2: Open Data Facilitation
Description of this step and the expected outcome
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero.
But first: what is open data?
- Open Data Intro
And these are some examples of what you can do with open data:
- Inspiration Cards
- App/Idea Catalog
Ready to get started? Great! Here are some of our recommended tools:
- Tools for Working with Data
Back to the previous step
Continue to the next step
Home
WORKING WITH DATA
Tools for Working with Data
Resources
Data Visualization
Digital Mock-up Creation
Programming Tools
App Builders
APIs
Search
Map Me
Chart Tool
Title of Resource
Open Tutorial
Go to Tool
Map Me
Description of this tool
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.
Step 1
Step 2
Step 3
Step 4
Choose dataset
Dataset 1
Dataset 2
Dataset 3
Previous
Next
Upload your own dataset
Cancel
OK
Back to overview

Fig. 15.

Blueprint

Stickdorn & Schneider define the service blueprint as “a way to specify and detail each individual aspect of a service”. It is a visual schematic that shows the perspectives of the user, the service provider and other actors involved, as well as the touchpoints and the processes needed to provide the service (Stickdorn & Schneider, 2015, pp. 204-207).

In the context of the proposed solution, two blueprints were made to show an ideal case of participants of a hackathon event with the following characteristics:

- They have little knowledge about open data
- They are first-time users of the ODL Platform
- They use a combination of digital and paper templates
- They will go through the Hackathon, as this is where the majority of the participants’ journeys will most likely end.

  Should they want to continue with the Post-Hack, the process resembles the “Further Development” part of the blueprint of the independent context.

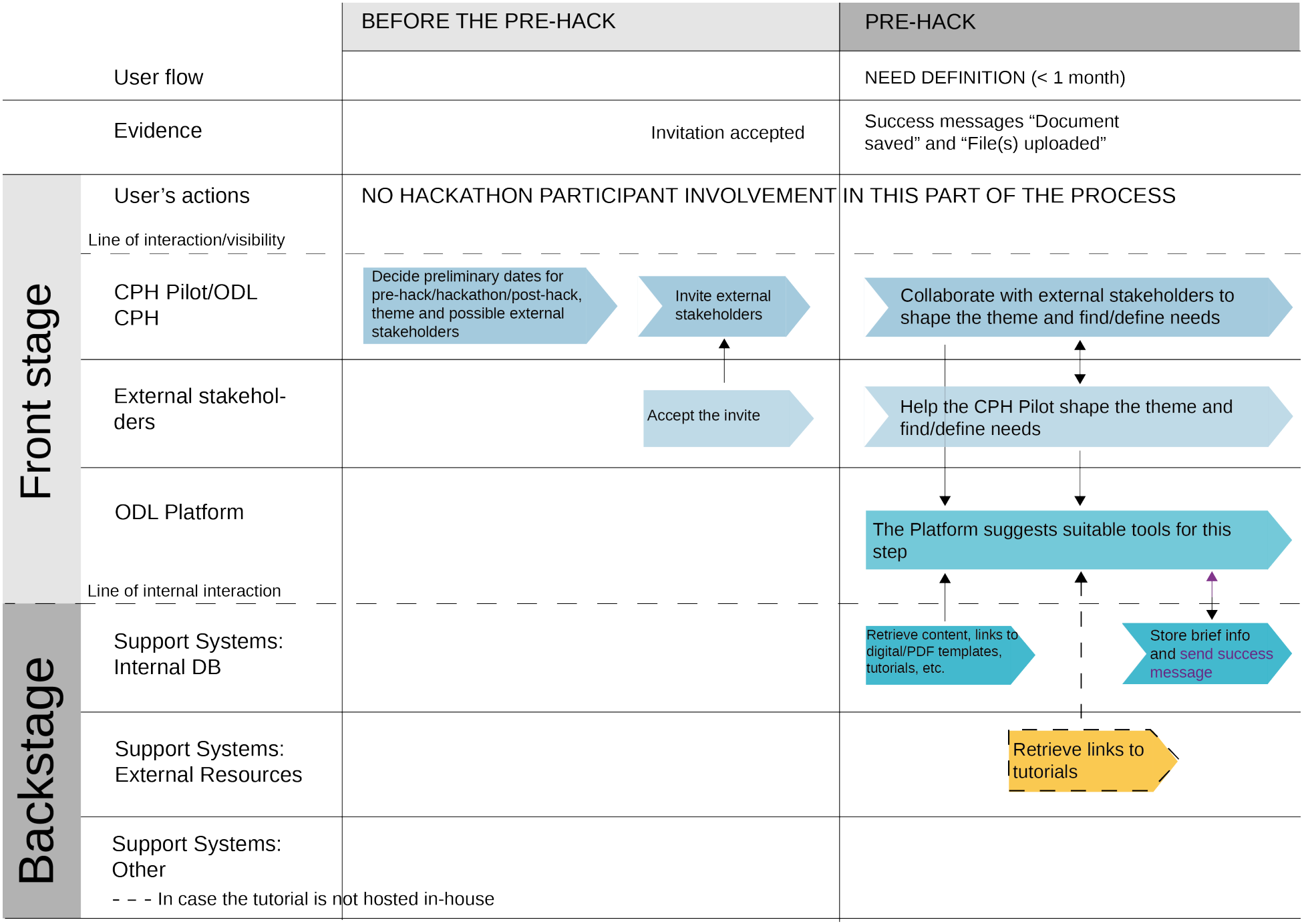
The first blueprint showcases the general process. This blueprint has been further divided into 2: one that shows the Pre-Hack and one that shows the Hackathon. This is because the hackathon event participants do not participate in the Pre-Hack and only see the end results: the brief(s), the criteria for evaluating the pitches and the format of the Open Data Facilitation Session.

The second blueprint focuses on one key moment in the process: the Open Data Facilitation Session. The Open Data Facilitation Session can take different formats; in this case, the example shown is an external data expert holding a session where the participants used their initial ideas to learn how to use the tools, thus using data as a filter to choose which of the ideas was more viable for them to realize into a service concept.

The blueprints complement the proposed process in that it shows which actions are necessary to enable the interactions between the co-design participants, the ODL Platform, the CPH Pilot[11] and all other actors and/or resources involved.

11 ODL CPH stands for Open Data Lab Copenhagen.

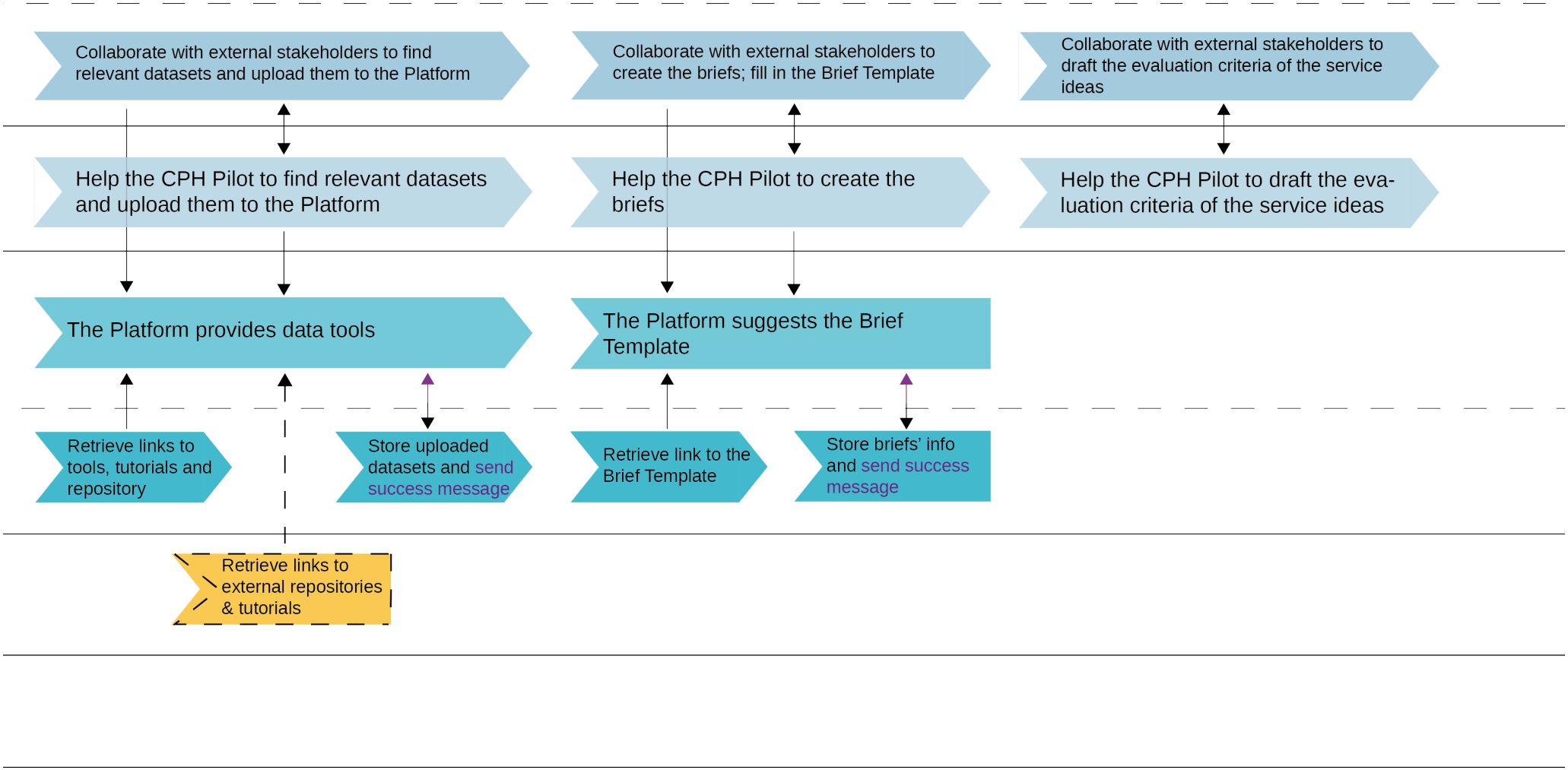
Blueprint - General: Pre-Hack

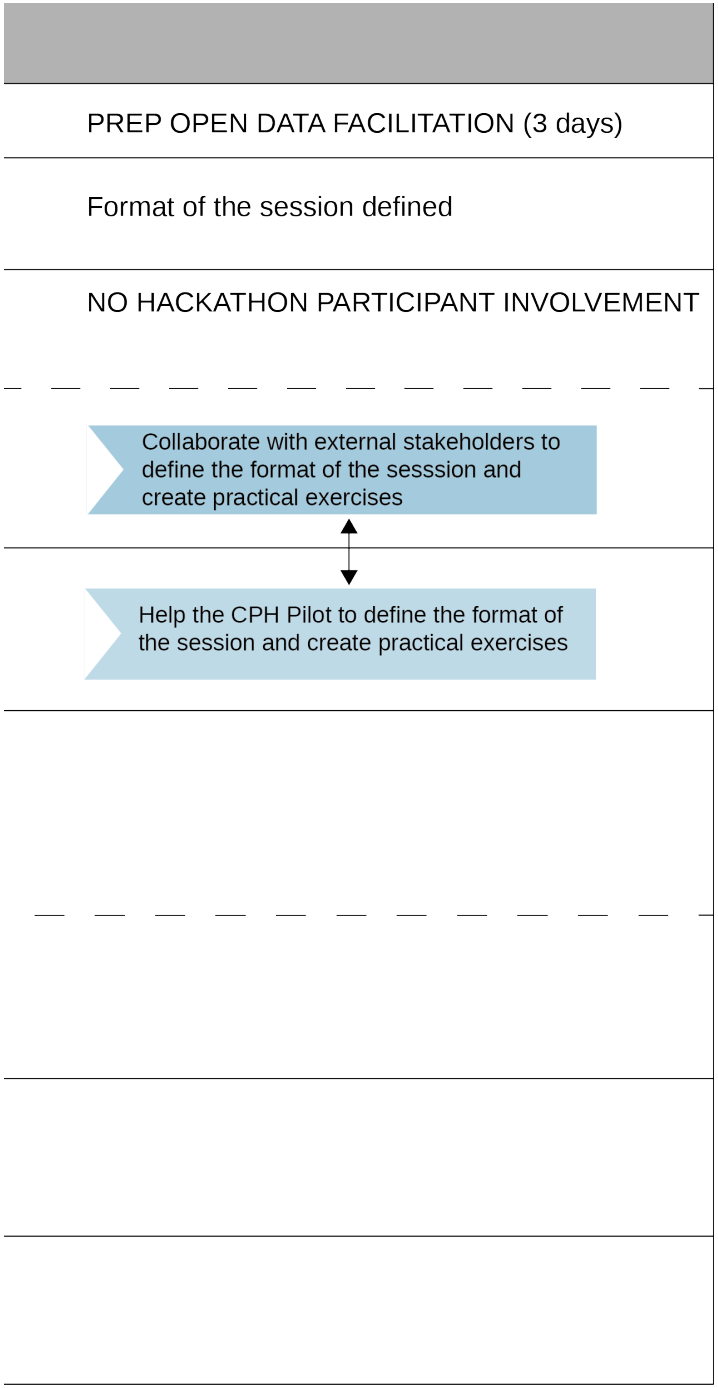


PRE-HACK

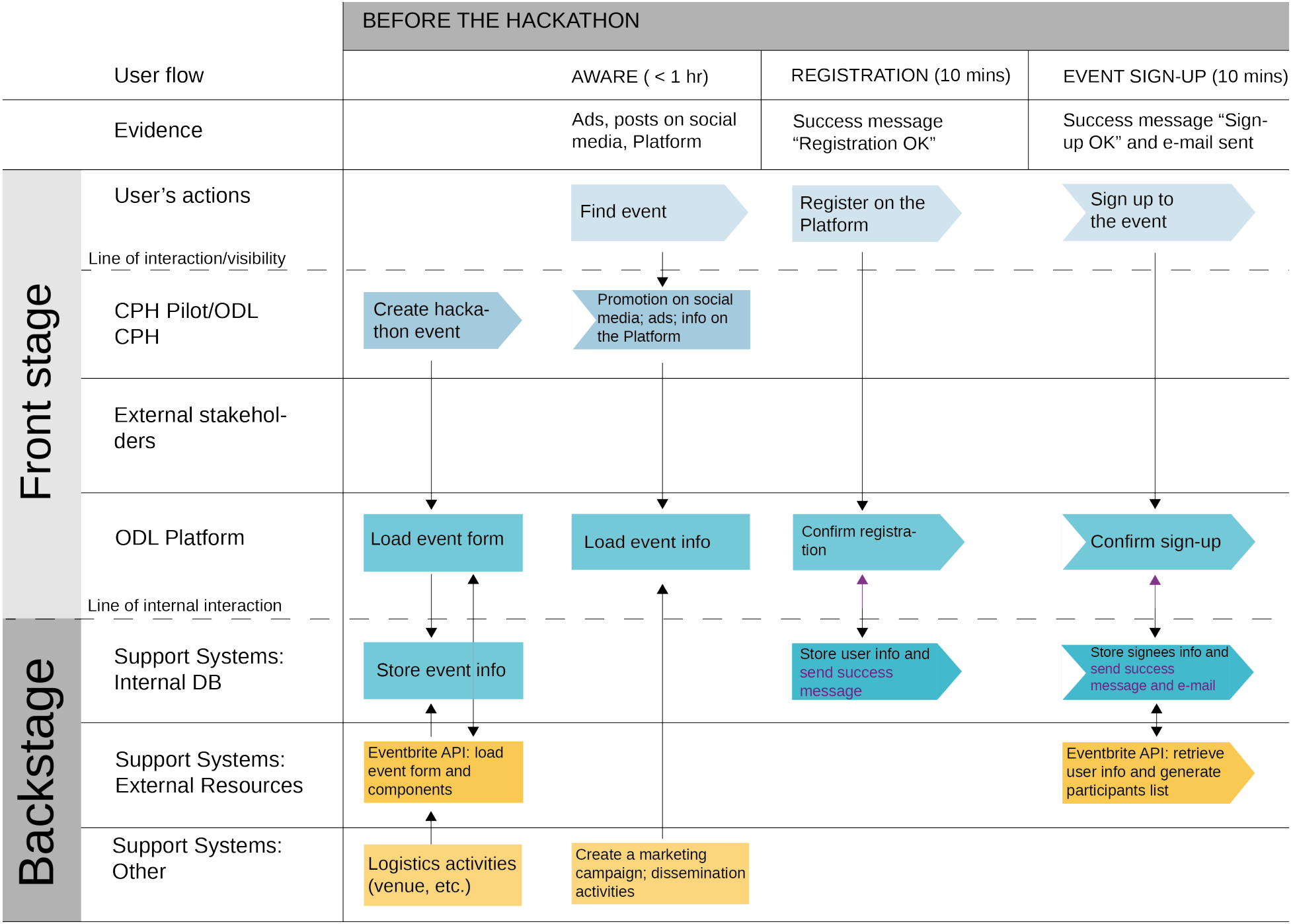
DATA EXPLORATION (< 1 month)	BRIEF CREATION (< 1 day)	
Success messages “Datasets found” and “Dataset uploaded”	Success message “Brief created”	

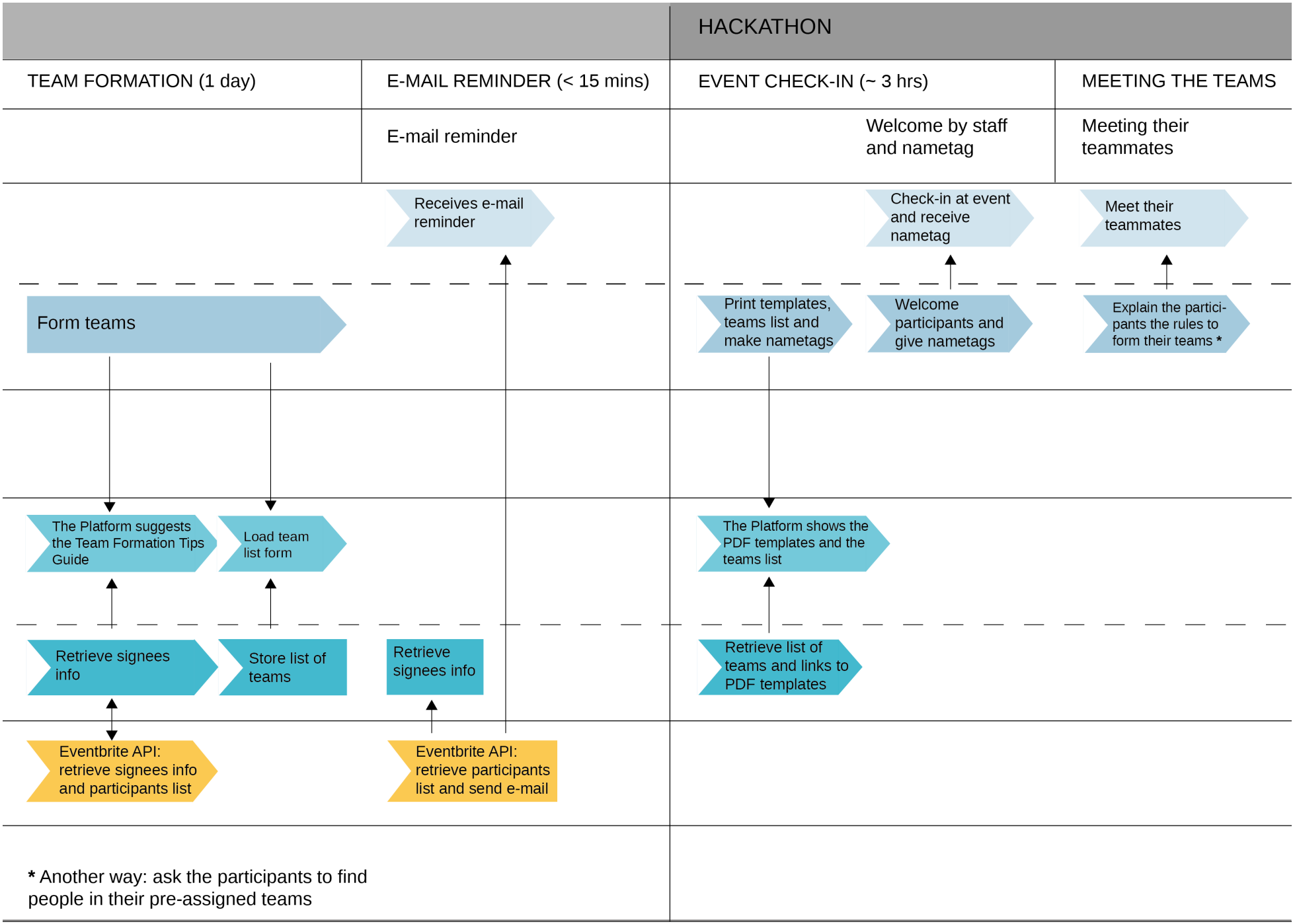
NO HACKATHON PARTICIPANT INVOLVEMENT IN THIS PART OF THE PROCESS

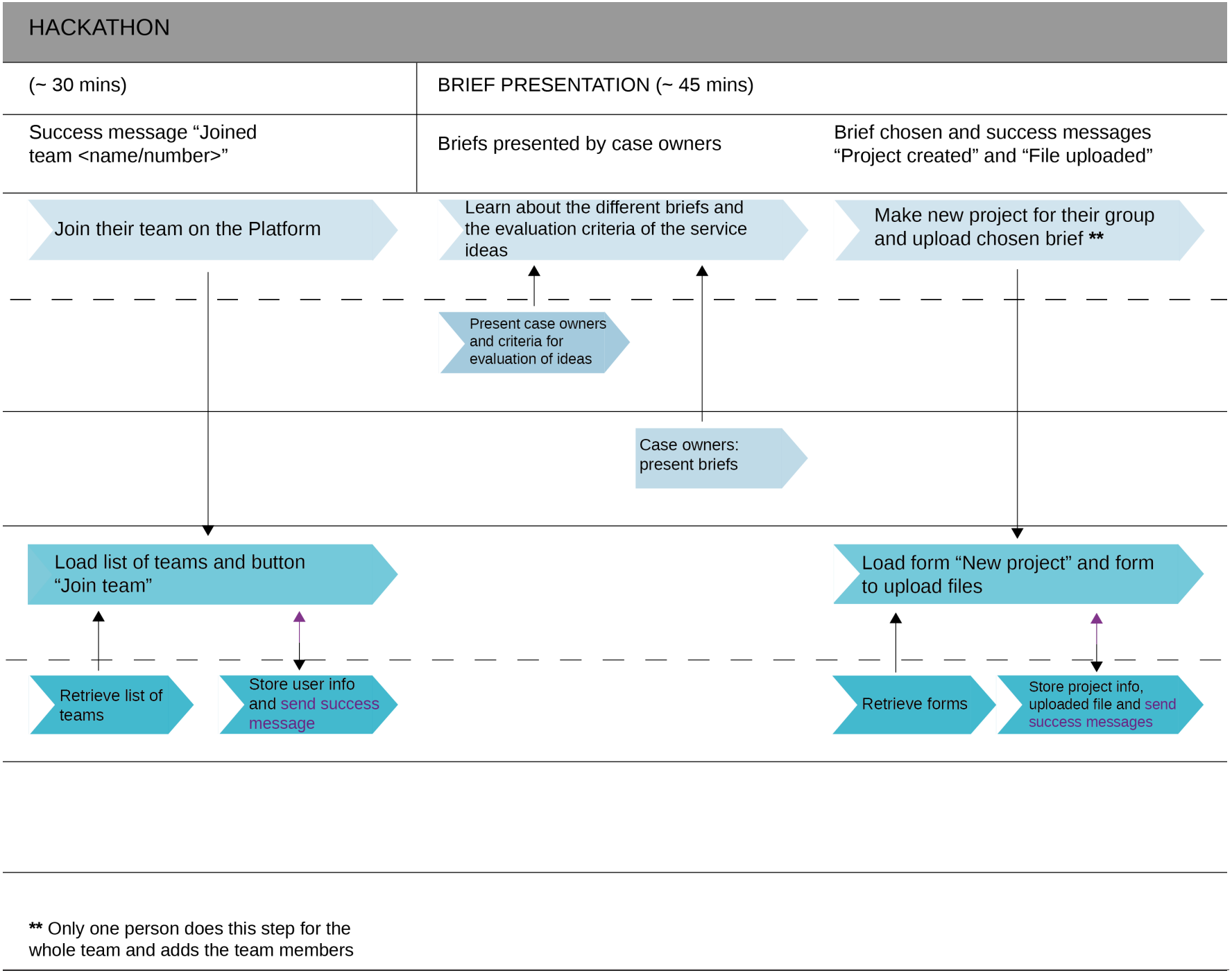



PREP OPEN DATA FACILITATION (3 days)
Format of the session defined
NO HACKATHON PARTICIPANT INVOLVEMENT
Collaborate with external stakeholders to define the format of the sesssion and create practical exercises
Help the CPH Pilot to define the format of the session and create practical exercises

Blueprint - General: Hackathon



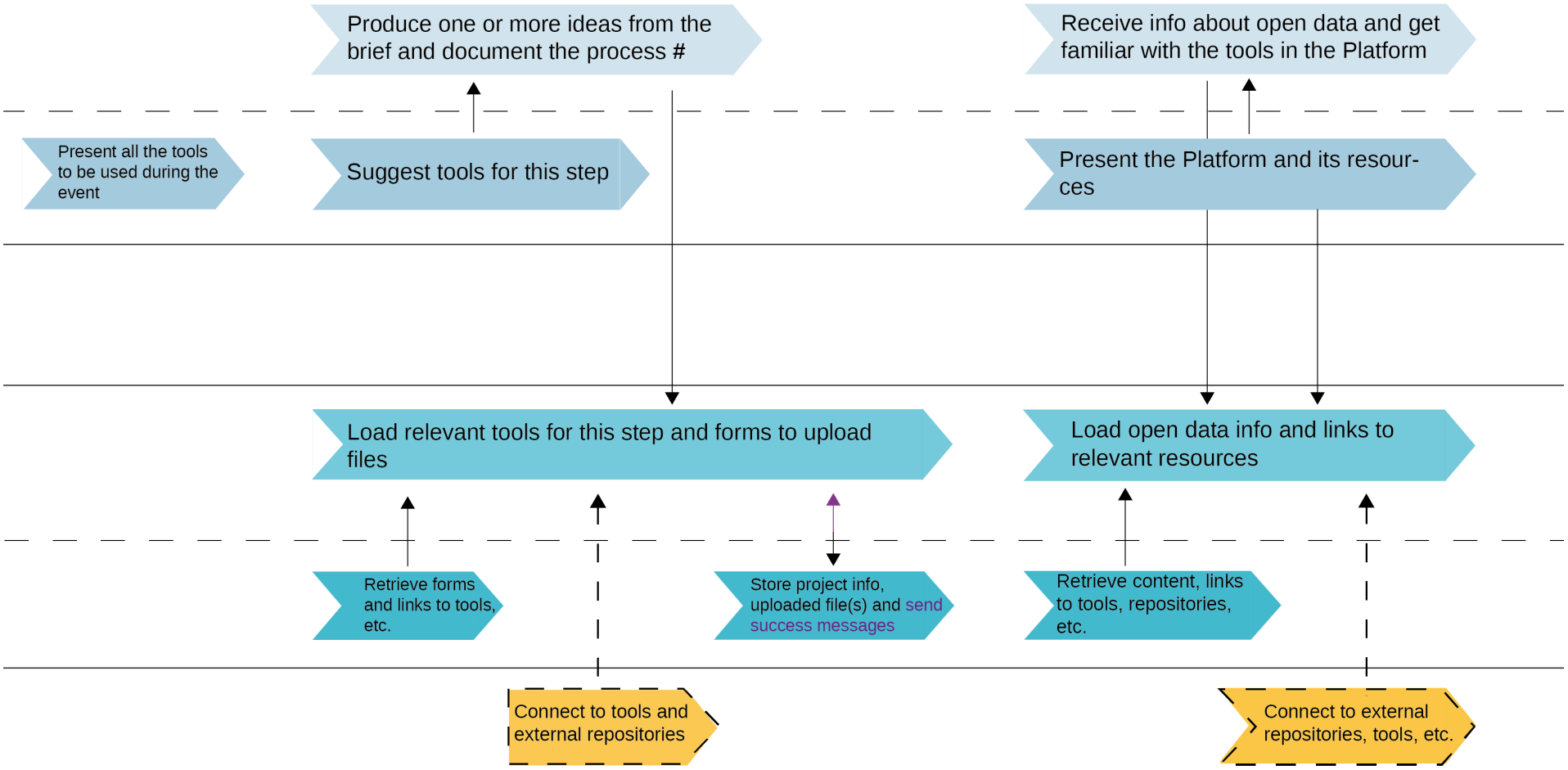

HACKATHON
TEAM FORMATION (1 day)
E-MAIL REMINDER (< 15 mins)
EVENT CHECK-IN (~ 3 hrs)
MEETING THE TEAMS
E-mail reminder
Welcome by staff and nametag
Meeting their teammates
Receives e-mail reminder
Check-in at event and receive nametag
Meet their teammates
Form teams
Print templates, teams list and make nametags
Welcome participants and give nametags
Explain the partici-pants the rules to form their teams *
The Platform suggests the Team Formation Tips Guide
Load team list form
The Platform shows the PDF templates and the teams list
Retrieve signees info
Store list of teams
Retrieve signees info
Retrieve list of teams and links to PDF templates
Eventbrite API: retrieve signees info and participants list
Eventbrite API: retrieve participants list and send e-mail
* Another way: ask the participants to find people in their pre-assigned teams



** Only one person does this step for the whole team and adds the team members

HACKATHON

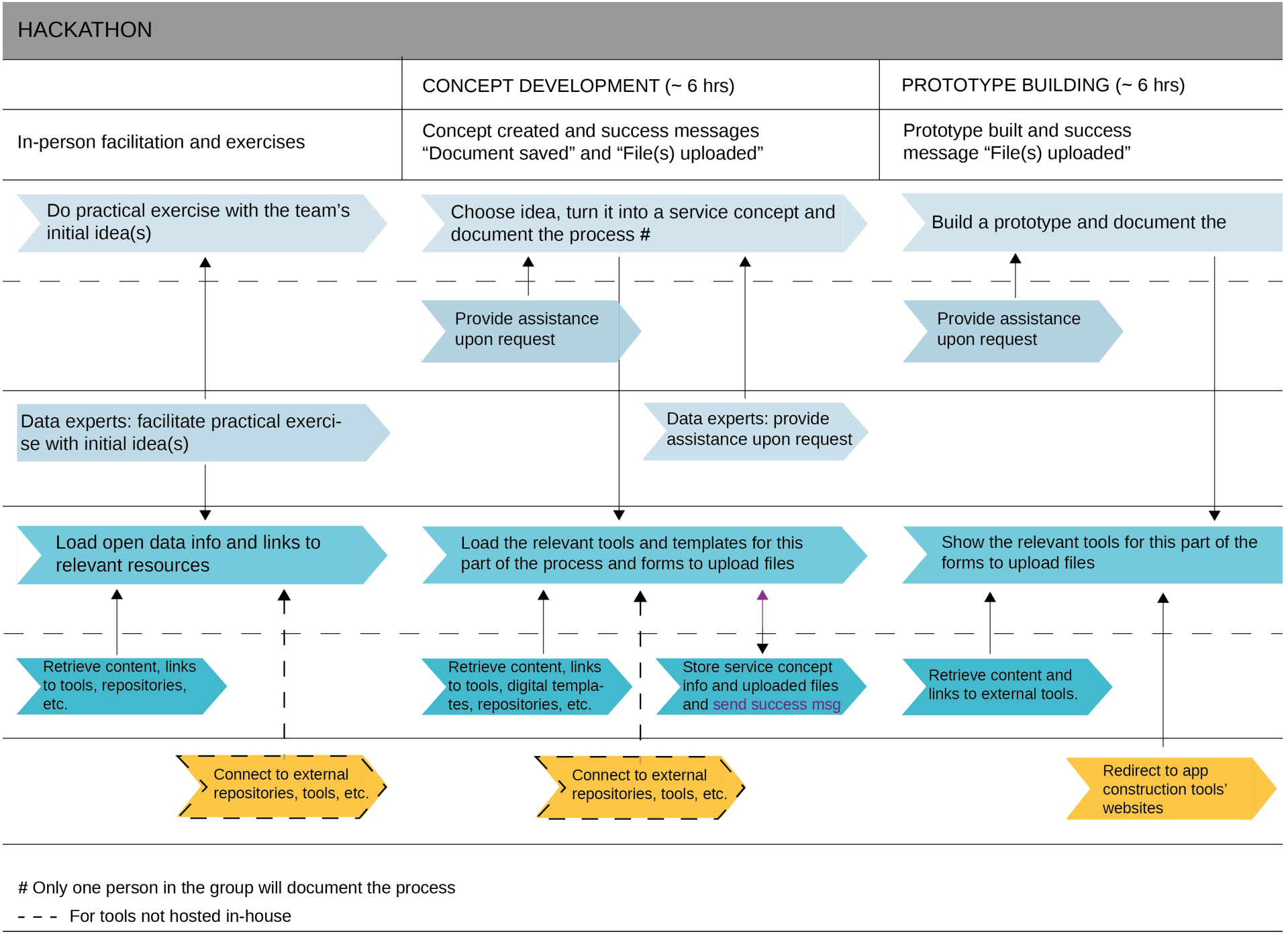
	BRAINSTORMING (~3 hrs)	OPEN DATA FACILITATION (~3 hrs) !
Learn about the available tools	Idea(s) produced and success message “File uploaded”	Info about open data and resources



! See blueprint “Key Moment: Open Data Facilitation” for further details

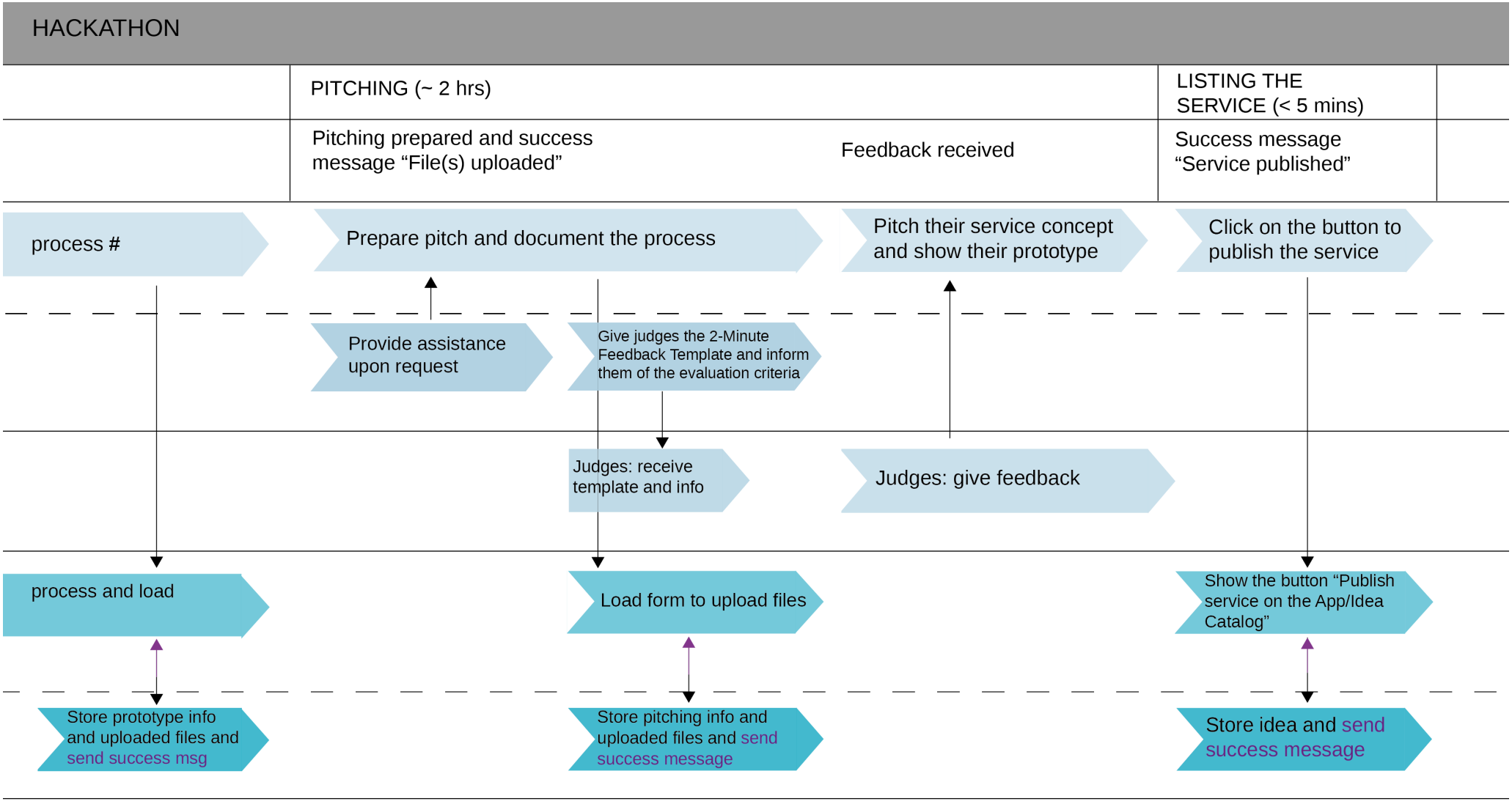
Only one person in the group will document the process

- - - For tools not hosted in-house

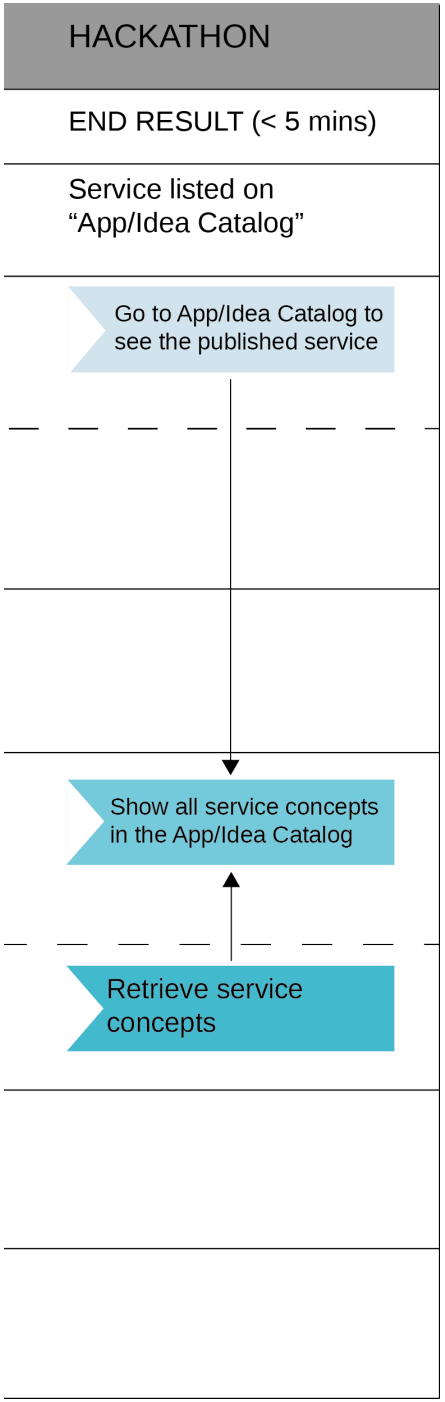


Only one person in the group will document the process

- - - For tools not hosted in-house

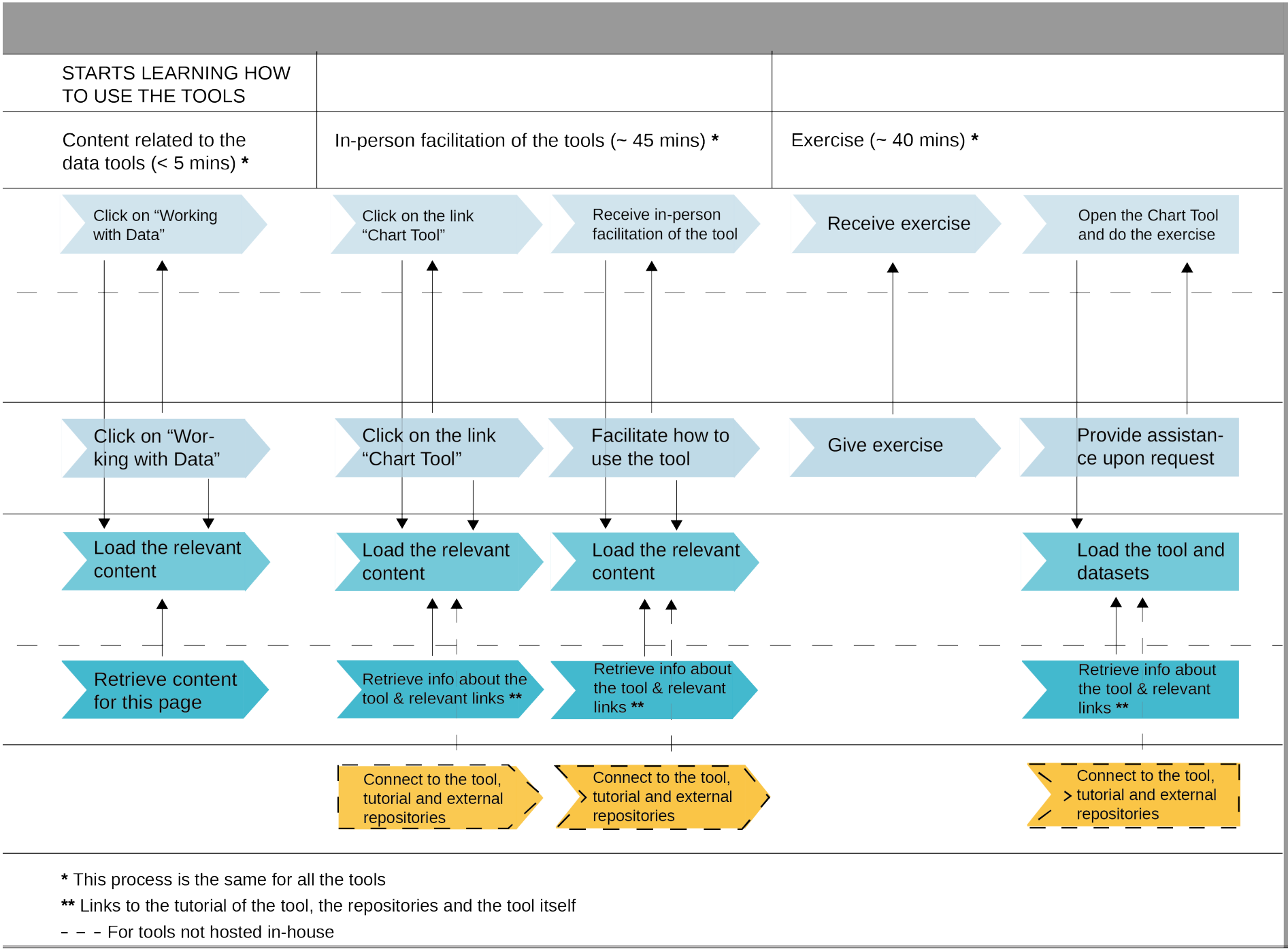


Only one person in the group will document the process


HACKATHON
END RESULT (< 5 mins)
Service listed on
“App/Idea Catalog”
Go to App/Idea Catalog to see the published service
Show all service concepts in the App/Idea Catalog
Retrieve service concepts

Blueprint - Key Moment: Open Data Facilitation

	HACKATHON		
User flow	INTRODUCTION TO THE ODL PLATFORM (~ 45 mins)	INTRODUCTION TO OPEN DATA (~ 30 mins)	EXAMPLES OF OPEN DATA-BASED SERVICES (< 15 mins)
Evidence	Platform introduced	Open Data Introducion	Inspiration Cards
Front stage			
User's actions	Get familiar with the tools in the Platform	Click on "Learn about open data"; listen to in-person explanation	Read some Inspiration Cards
Line of interaction/visibility			
CPH Pilot/ODL CPH	Present the Platform, the Step-by-Step guide and its resources		Present the Inspiration Cards
External stakehol-ders		Data experts: introduce open data	
ODL Platform	Load info and tools relevant to Step 2 of the Step-by-Step Guide	Load the info related to the Open Data Introduction	Load the Inspiration Cards
Line of internal interaction			
Backstage			
Support Systems: Internal DB	Retrieve content, links to tools, repositories, etc.	Retrieve content related to the Open Data Introduction	Retrieve Inspiration Cards
Support Systems: External Resources			
Support Systems: Other			



***** This process is the same for all the tools

****** Links to the tutorial of the tool, the repositories and the tool itself

\- - - For tools not hosted in-house

Independent Context

Proposed Process

This process (Fig. 16) has been designed thinking of those citizens who wish to undertake an independent process of learning and service creation. The process is meant to have a certain reciprocity with the co-design context process where relevant, in which the ODL Platform acts as the facilitator of knowledge and provider of the necessary resources for the citizen to achieve comparable results as if they participated in a co-design event.

This context is characterized for having an unlimited timeline, contrary to the co-design event which usually lasts between 48 and 72 hours.

As with its counterpart at the co-design process, the Open Data Self-Study is a critical part of this process. It is recommended to have instructive videos that, together with small practical exercises (done with datasets already available on the Platform), the citizen can use to learn how a good dataset looks like, how to visualize a dataset on a map or a chart, etc. Thus, by having these videos the in-person facilitation that occurs in the co-design event would be reciprocated, and the citizen could watch them whenever such a need arises.

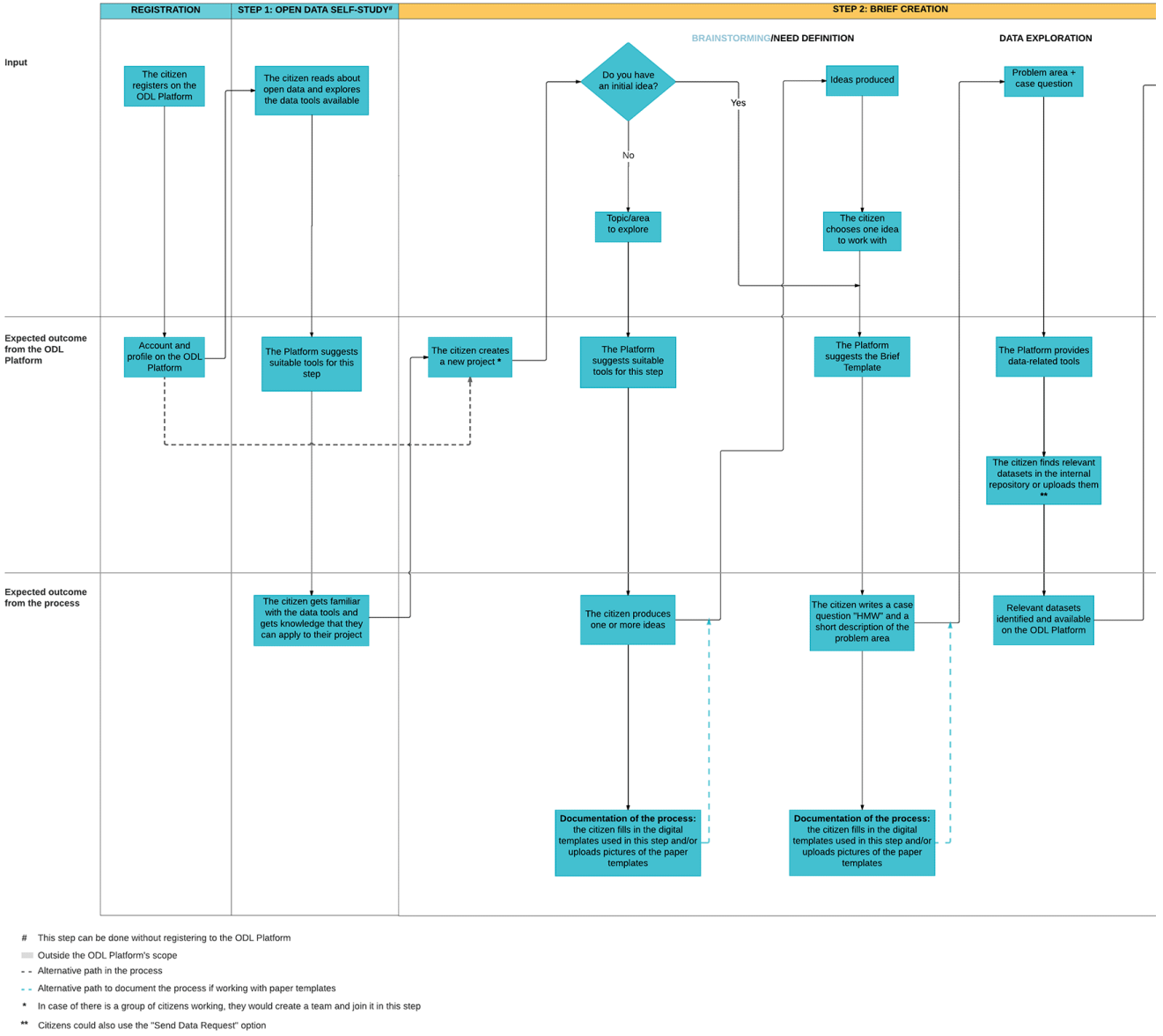
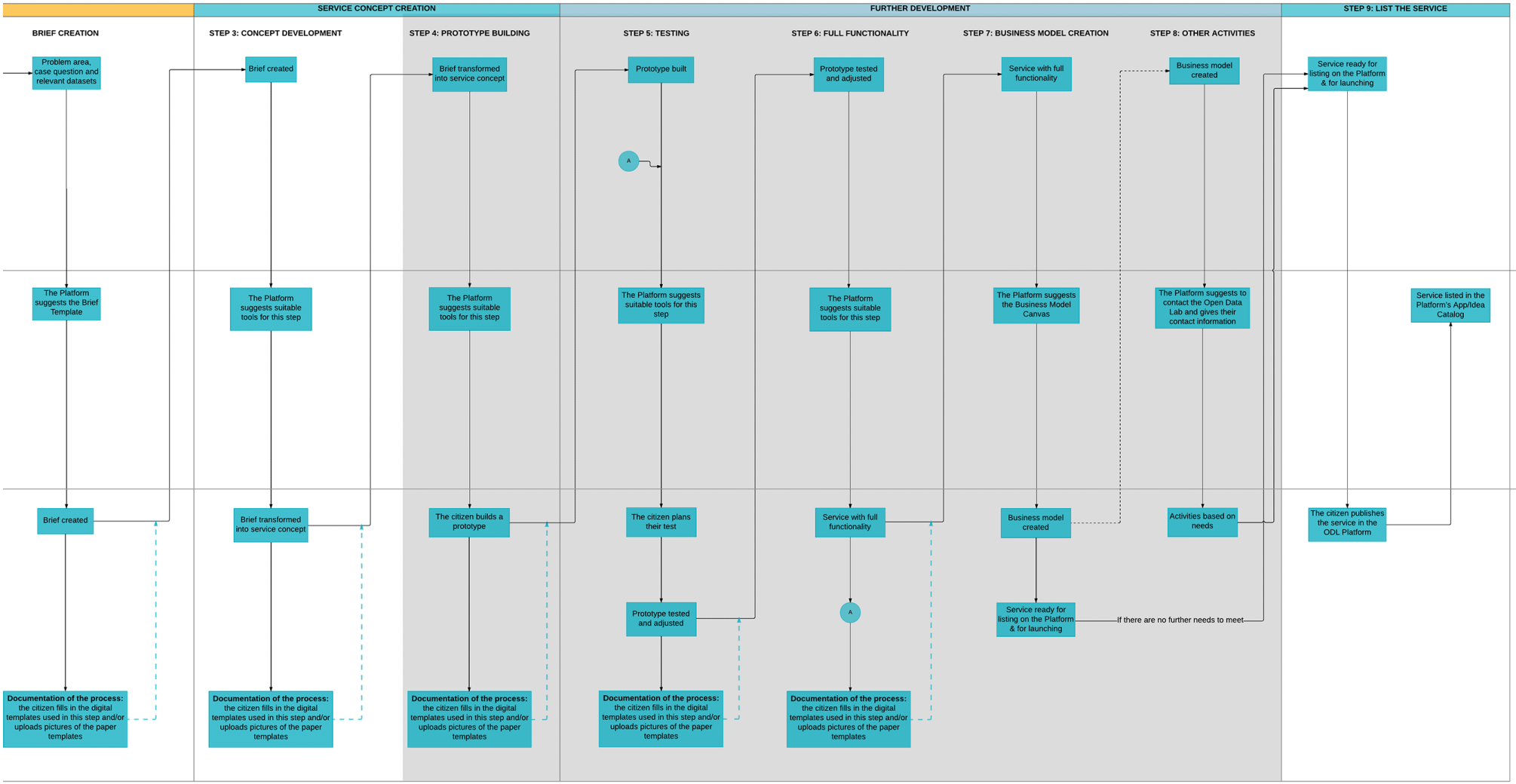


Fig. 16.



\# This step can be done without registering to the ODL Platform

Outside the ODL Platform's scope

\- - Alternative path in the process

\- - Alternative path to document the process if working with paper templates

* In case of there is a group of citizens working, they would create a team and join it in this step

[1]* Citizens could also use the "Send Data Request" option

Step-by-Step Guide

The step-by-step guide is the way in which the proposed process will be visualized to the citizen. In this context it is also intended to serve as an aid to the facilitators and organizer team. This guide is designed to have 9 steps, which correspond to the steps shown in the proposed process. With each step the guide will provide the necessary tools to accomplish the expected outcomes and point to where they are located on the ODL Platform (Table 5). This guidance is expected to be particularly useful in this context, as the Platform will attempt to simulate the facilitation that would take place at a co-design event.

As with the co-design context, the guide, while structured, is flexible enough to allow the citizen to decide whether they wish to use all the tools or only those they consider relevant for their solution. In addition, they can skip a step (particularly one of the later ones) should they not consider it pertinent to what they wish to accomplish.

To read more about the tools, please refer to the section “Proposed Toolbox”.

Fig. 17 shows a selection of wireframes where it can be observed how the guide could be displayed on the ODL Platform and the sought functionality as the citizen clicks through the steps.

Step	Suggested Tools/Templates

Step 1: Open Data Self-Study	• Open Data Introduction
	• Inspiration Cards
	• Dataset Repository
	• Data Handling Tools:
	  • Search Dataset
	  • Upload Dataset
	  • Create Dataset
	  • Check Dataset
	• Data Visualization Tools (map and charts)
	• Data Scraping Tools
	• Instructive videos about how to use the data-related tools
	• Exercises with small challenges where citizens put in practice what they learned

Step 2: Brief Creation	• Mind Map • Brainstorming Template • Need Definition Tool • Dataset Repository • Data Handling Tools (the same as in Step 1) • Data Visualization Tools (map and charts) • Data Scraping Tools • Brief Template
Step 3: Concept Development	• Concept Storyboard Template • Data Validation Tool • Refine Concept Template • Persona Template • Scenario Tool • Customer Journey Canvas • Stakeholder Map

Table 5.

Step	Suggested Tools/Templates
Step 4: Prototype Building	App Construction Tools • Digital Mock-up Tools • Programming Tools • App Builders • Learning Tools • APIs
Step 5: Testing	• Prototype Testing Guide: Usability
Step 6: Full Functionality	• App Construction Tools (the same as in Step 4)
Step 7: Business Model Creation	• Business Model Canvas
Step 8: Other Activities (optional)	• Depends on the activity
Step 9: List the Service	• A button on the ODL Platform to list the service

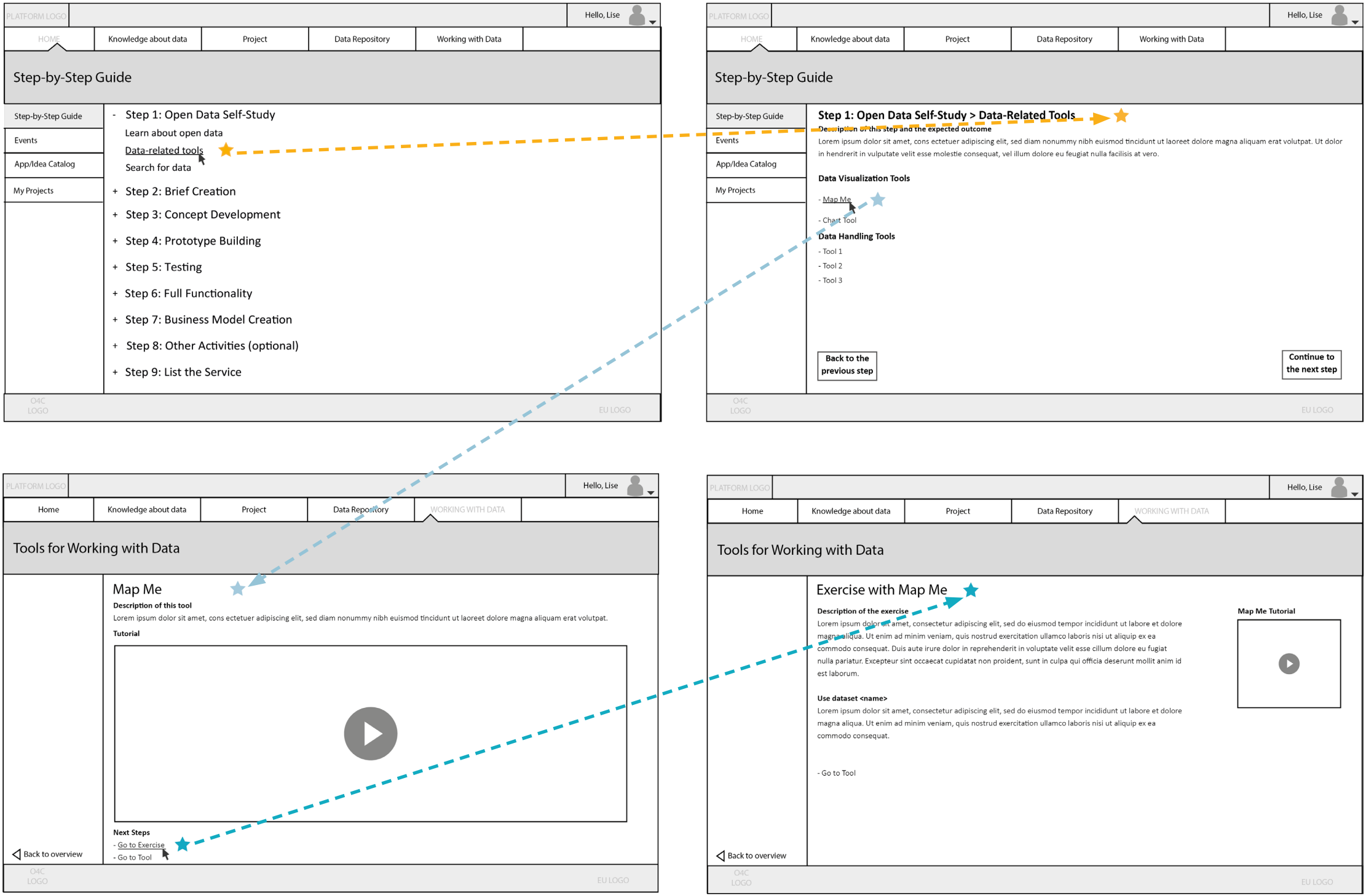

PLATFORM LOGO
Hello, Lise
HOME
Knowledge about data
Project
Data Repository
Working with Data
Step-by-Step Guide
Step-by-Step Guide
Events
App/Idea Catalog
My Projects
- Step 1: Open Data Self-Study
Learn about open data
Data-related tools
Search for data
+ Step 2: Brief Creation
+ Step 3: Concept Development
+ Step 4: Prototype Building
+ Step 5: Testing
+ Step 6: Full Functionality
+ Step 7: Business Model Creation
+ Step 8: Other Activities (optional)
+ Step 9: List the Service
O4C LOGO
EU LOGO
Step 1: Open Data Self-Study > Data-Related Tools
Description of this step and the expected outcome
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero.
Data Visualization Tools
- Map Me
- Chart Tool
Data Handling Tools
- Tool 1
- Tool 2
- Tool 3
Back to the previous step
Continue to the next step
Home
WORKING WITH DATA
Tools for Working with Data
Map Me
Description of this tool
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.
Tutorial
Next Steps
- Go to Exercise
- Go to Tool
Back to overview
Exercise with Map Me
Description of the exercise
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.
Use dataset <name>
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
- Go to Tool
Map Me Tutorial

Fig. 17.

Blueprint

As with the co-design context process, two blueprints have been made for the independent context. The blueprints complement the proposed process in that it shows which actions are necessary to enable the interactions between the citizen, the ODL Platform, the CPH Pilot and all other actors or resources involved.

The case shown is a citizen with the following characteristics:

- They have no knowledge about open data
- They are a first-time user of the ODL Platform
- They have an initial idea they wish to make into a service
- They use a combination of digital and paper templates

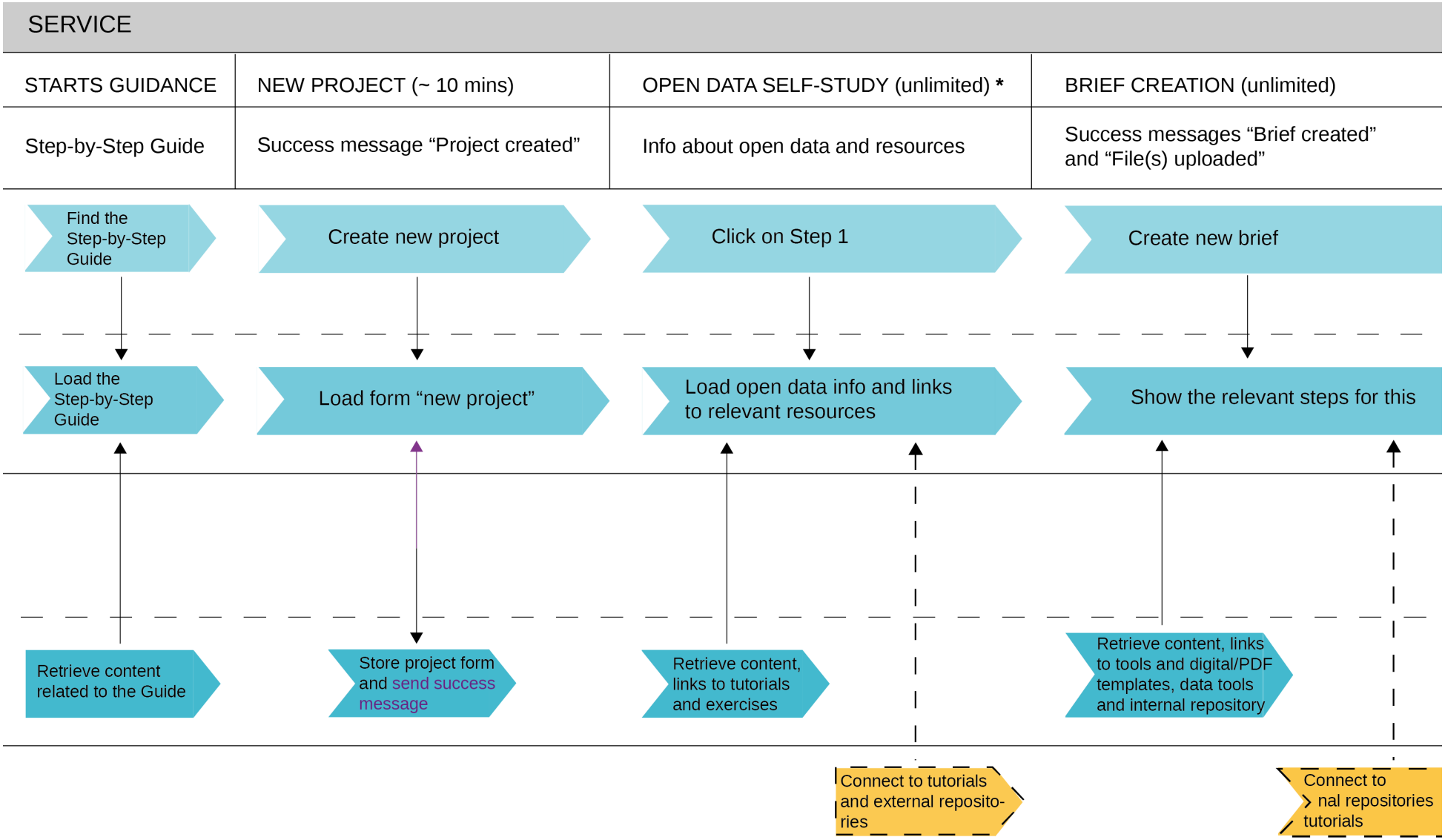
The first blueprint showcases the general process the citizen goes through to create a service. The second one focuses on one key moment in the process: the Open Data Self-Study. The example used in this blueprint is partly portrayed in the wireframe sequence shown in the previous page.

The blueprints complement the proposed process in that it shows which actions are necessary to enable the interactions between the co-design participants, the ODL Platform, the CPH Pilot[12] and all other actors and/or resources involved.

12 ODL CPH stands for Open Data Lab Copenhagen.

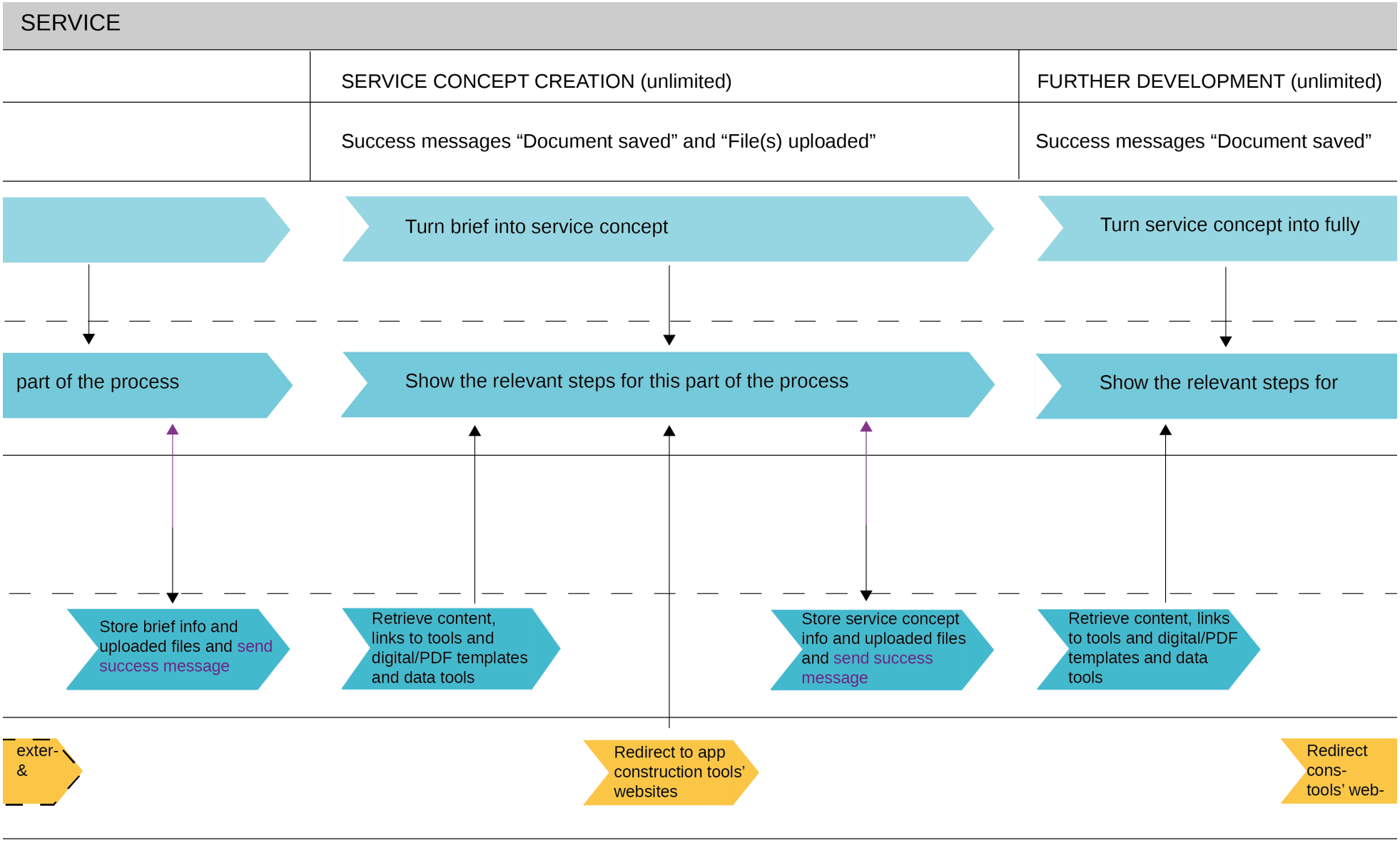
Blueprint - General

	PRE SERVICE	SERVICE	
User flow		AWARE (< 1 hr)	REGISTRATION (10 mins)
Evidence		Ads, posts on social media, websites	Success message “Registration OK”
Front stage			
User’s actions		Find the Platform and read about it	Register on the Platform
Line of interaction			
ODL Platform		Information about the Platform and its offerings	Confirm registra-tion
Line of visibility			
Backstage			
CPH Pilot/ODL CPH	Create content and keep it up-to-date	Promotion on social media and websites; create ads	
Line of internal interaction			
Support Systems: Internal DB	Store content and send success message		Store user info and send success message
Support Systems: External Resources	Retrieve links to video tutorials and tools		
Support Systems: Other		Create a marketing campaign	

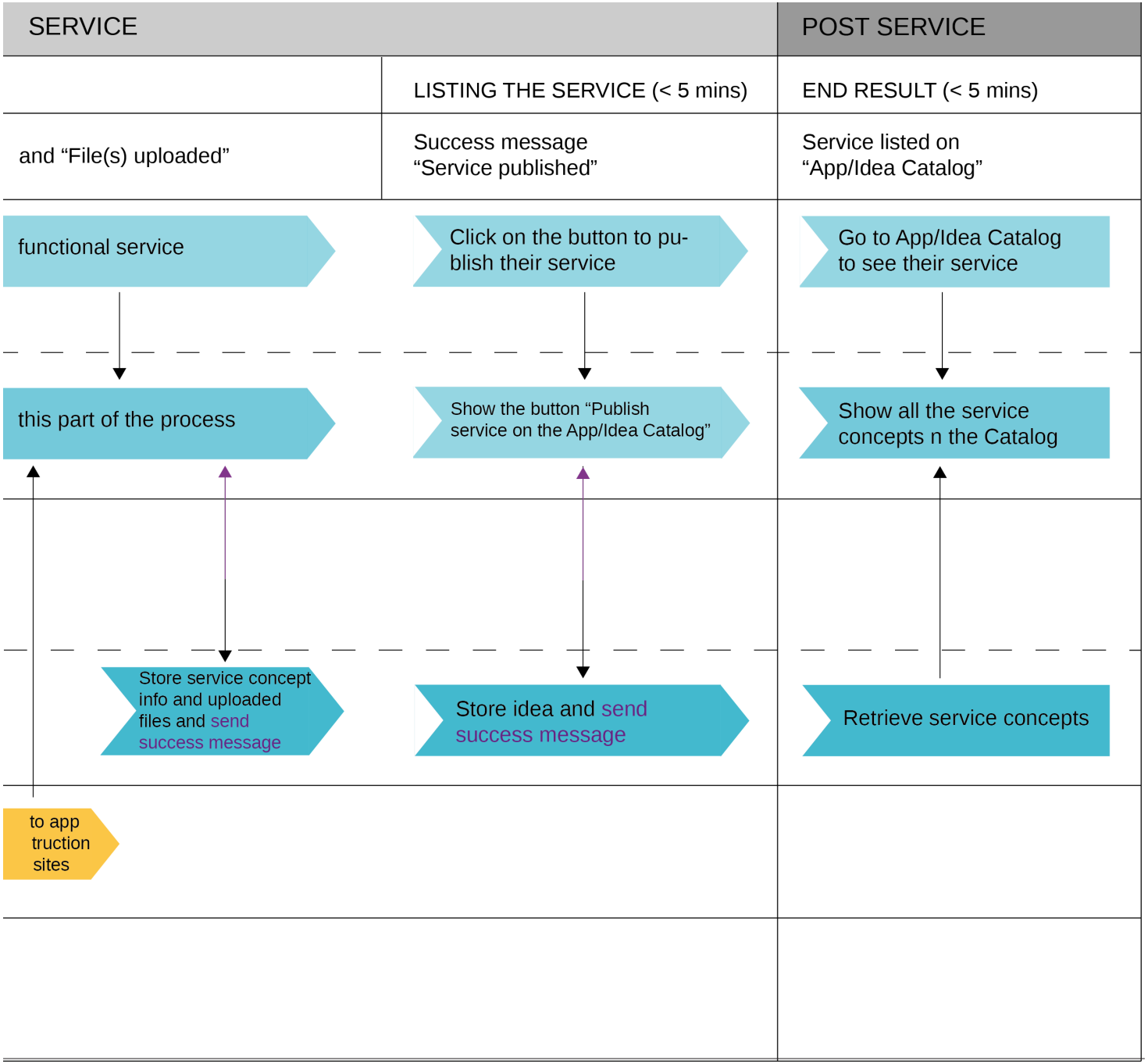


***** See blueprint “Key Moment: Open Data Self-Study” for further details

- – - In case the tutorial is not hosted in-house

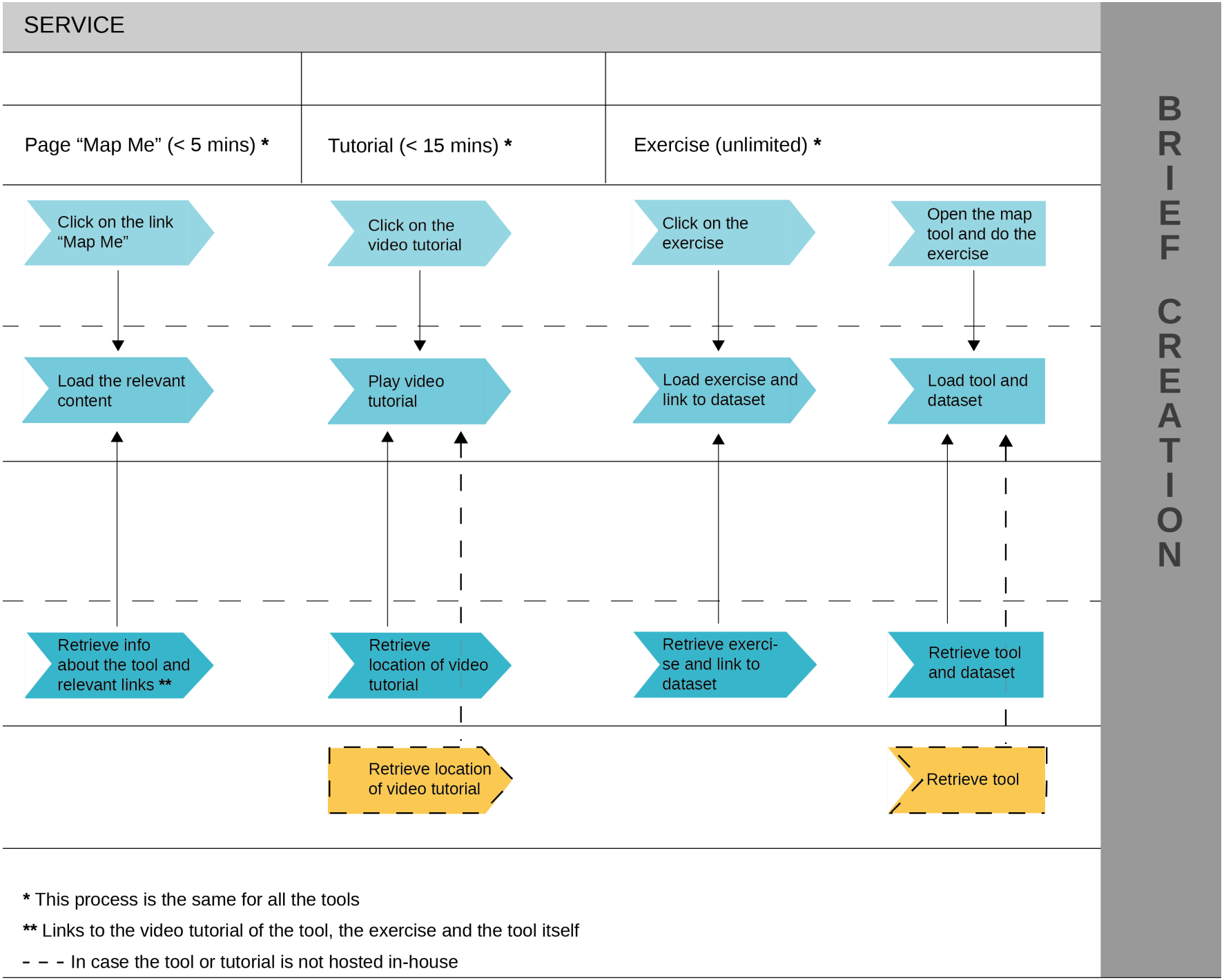


- – - In case the tutorial is not hosted in-house


SERVICE
POST SERVICE
LISTING THE SERVICE (< 5 mins)
END RESULT (< 5 mins)
and “File(s) uploaded”
Success message
“Service published”
Service listed on
“App/Idea Catalog”
functional service
Click on the button to pu-
blish their service
Go to App/Idea Catalog
to see their service
this part of the process
Show the button “Publish
service on the App/Idea Catalog”
Show all the service
concepts n the Catalog
Store service concept
info and uploaded
files and send
success message
Store idea and send
success message
Retrieve service concepts
to app
truction
sites

Blueprint - Key Moment: Open Data Self-Study

	SERVICE		
User flow	READS ABOUT OPEN DATA (< 30 mins)	SEES EXAMPLES OF OPEN DATA-BASED SERVICES (< 15 mins)	STARTS LEARNING HOW TO USE THE TOOLS
Evidence	Open Data Introduction	Inspiration Cards	Content related to the data tools (< 5 mins)
Front stage			
User's actions	Click on "Learn about open data"	Read some Inspiration Cards	Click on "Data-related tools"
Line of interaction			
ODL Platform	Load the info related to the Open Data Introduction	Load the Inspiration Cards	Load the relevant content
Line of visibility			
Backstage			
CPH Pilot/ODL CPH			
Line of internal interaction			
Support Systems: Internal DB	Retrieve content related to the Open Data Introduction	Retrieve Inspiration Cards	Retrieve content for this page
Support Systems: External Resources			
Support Systems: Other			



***** This process is the same for all the tools

****** Links to the video tutorial of the tool, the exercise and the tool itself

- – - In case the tool or tutorial is not hosted in-house

Proposed Toolbox

The proposed toolbox includes tools (Table 6) from the Hackathon Starter Kit from 2016, and tools and templates that have been adapted, created or chosen for this project, on the premise that this combination is considered suitable to transform the inputs into the expected outcomes.

Tools Specifically Adapted or Created

The **Brief Template** (Fig. 18) gives the basics of what a case brief should have in terms of content. It was adapted from the briefs observed at Open Tourism Days.

The **Brainstorming Template** (Fig. 19) is based on job stories[13] and aims for citizens and participants to have a focused brainstorming session.

The **Concept Storyboard Template** (Fig. 20) helps citizens and participants to turn their initial ideas into a more solid concept, including writing which data they need for the key service interactions. It is intended that with this tool they will think of data as a core element of their service concepts as early as possible.

With the **Refine Concept Template** (Fig. 21) other aspects of their refined idea, thus making it more complete.

The **Persona Tool** (Fig. 22) aims to guide citizens and participants into creating personas to represent the target groups for the service concepts they create. This is an adaptation from the tool found at Xtensio.

The **Prototype Testing Guide** (Figs. 23a and 23b) consists of a collection of practical tips used in my professional life, from Thomas Snitker's book Breaking Through to the Other Side (Snitker, 2004, pp. 102-107) and Justin Mifsud's article about testing mobile applications on Usability Geek (Mifsud, 2016). It includes the Usability Test Plan Template, which is a one-page document that covers different aspects of testing, and it has been adapted from the Usability Test Plan Dashboard created by User Focus (Travis, 2013).

Part of the support that the ODL Platform offers to the facilitator and organizer team of co-design events concerns to the team formation. A digital tool that will automatically form the teams has not been found. In fact, this is such an important part of any co-design event, that it is preferred to do manually (Fig. 24). To that end, the **Team Formation Tips Guide** (Fig. 25) aims to help organizers of a co-design event in making the teams for their event. It also provides a suggestion for an icebreaker activity for the teams to meet each other for the first time. This guide will be available in digital and PDF formats.

13 A job story is a method inspired in Jobs-to-be-Done and it is a way to frame a problem, focusing on 3 concrete steps: Situation, Motivation, Outcome, thus removing the many assumptions that a user story could have. Source: https://jtbd.info/replacing-the-user-story-with-the-job-story-af7cdee10c27

Tool	Pre-Hack		Hackathon	Post-Hack	PDF or Digital
	Need Definition	Data Exploration			
Mind Map	✓				PDF
Need Definition Tool *	✓				Both
Dataset Repository !		✓	✓		Digital
Data Visualization Tools (maps and charts) !		✓	✓		Digital
Data Scraping Tools		✓	✓		Digital
Data Handling Tools		✓	✓		Digital
Brief Template #	✓	✓			Both
Open Data Introduction and Inspiration Cards !			✓		Both
Brainstorming Template #	✓		✓		Both
Concept Storyboard Template #			✓		Both
Refine Concept Template #			✓		Both
Data Validation Tool *			✓		Both

Table 6.

Tool	Pre-Hack		Hackathon	Post-Hack	PDF or Digital
	Need Definition	Data Exploration			
Persona Template #			✓		Both
Scenario Tool *			✓		PDF
Customer Journey Canvas			✓		Both
Stakeholder Map			✓		Both
App Construction Tools + !			✓	✓	Digital
Pitching Tool *			✓		Both
Prototype Testing Guide: Usability #				✓	Both
Business Model Canvas				✓	Both

***** Tools from the Hackathon Starter Kit (2016)
! Tools already available on the ODL Platform
Tools that were created or adapted
+ Links to external resources in the Build App section

BRIEF TEMPLATE

Problem Area
Short description of the situation in which the problem occurs.

Case Question
The issue within the problem area that you wish to address.

How might we ...?

Suggested Datasets
Which kind of data is relevant to address the case question?

Fig. 18.

BRAINSTORMING TEMPLATE

Situation:	Motivation:	Expected outcome:
When _____	I want to _____	so that I can _____
Situation:	Motivation:	Expected outcome:
When _____	I want to _____	so that I can _____

Fig. 19.

CONCEPT STORYBOARD TEMPLATE

Situation:	**Key interaction:**	**Dataset(s) needed:**	**Data sources:** *Where would you find this data? Who owns it?*	**Desired outcome:**

Fig. 20.

REFINE CONCEPT TEMPLATE

When is it valuable? *(Scenario, timeframe)*	**Who is it for?** *(Main user, stakeholder, customer)*	**Why is it valuable?** *(Main impact, improvements)*

Fig. 21.

PERSONA TEMPLATE

"A quotation that captures this persona's personality"

Bio

Age:
Work:
Family:
Location:

Goals

-
-
-

Personality

Introvert — Extrovert

Thinking — Feeling

Sensing — Intuition

Judging — Perceiving

Frustrations

-
-
-

Trait 1 *Trait 2* *Trait 3* *Trait 4*

This template is adapted from the User Persona Template by Xtensio. Attribution: https://xtensio.com/

Fig. 22.

Think-Aloud Test

A Think-Aloud Test is a task-based test to test the functionality of a website or an app, where the participant expresses verbally their thoughts, feelings and experiences (positive and negative) while they carry out tasks. For example: you wish to test a recycling app you just made.

To prepare such a test you:

- Create a list of 5 to 7 tasks which are usually the key interactions or features of particular interest for the service. For the above example the tasks could could be: find the nearest glass container to your location, find battery containers at a particular address, etc.
- To provide a context for the tasks, they could be written as task scenarios and at the test you could phrase them as "Imagine that …" and the task scenario. For example:
- **Task scenario:** you have a lot of cardboard to recycle but you do not know where the nearest recycling container to your location is
- **Task at the test:** "Imagine that you have a lot of cardboard to recycle, but you do not know where the nearest container is. How would you find it on this app?"
- Take the test in order to familiarize with it and to log the time that it took to achieve each task. These results will be used for comparing those obtained from the test participants

Planning the Test

Before the Test

- Set the goal(s) of the test: what do you want to test? Make sure that the goals are realistic and measurable. Going back to the example, a goal could be that the participants find the information about the nearest container in less than 60 seconds
- As a minimum there should be one facilitator to moderate the test and talk to the participants, and one person to document and observe
- Recruit the participants, preferably from the service's target group. Five to six people per testing round is enough
- Choose the most suitable equipment for the test that will be performed: stationary computer, laptop, tablet or cell phone according to the prototype and what will be tested. The device(s) should have the prototype ready to be tested
- Consider how you wish to record the test: video, pictures, audio, screen capture or a combination of tools
- Agree on any possible compensations for the participants, if applicable
- Plan on refreshments for the participants and the testing staff

One tool designed to simplify the preparation of the test is the Usability Test Plan Template.

When the Test Participants Arrive

- Inform about the practicalities of the test:
  - The objective of the test
  - How long the test is expected to take
  - How the test will be and that you are testing a prototype and not them, thus there are no wrong answers
  - How the test will be recorded
  - Compensations, if that is the case
- Set up the test prior to receiving the next participant

After the Test

- Compare the results from the test participants with the results from your test. Which main insights have you learned from the test? Did you reach your goal(s)?
- Adjust the prototype accordingly and decide if further testing is needed

Fig. 23a.

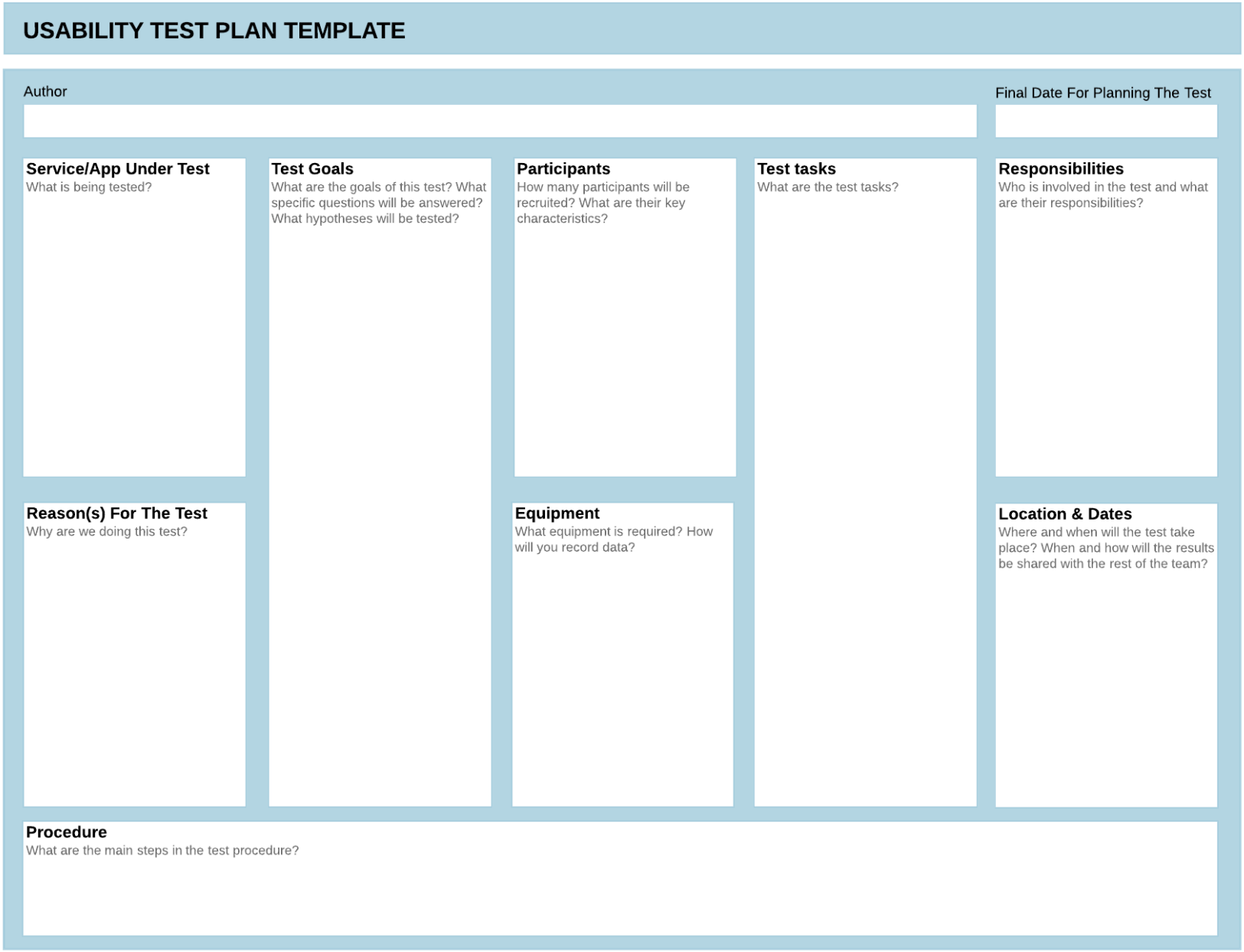


Fig. 23b.

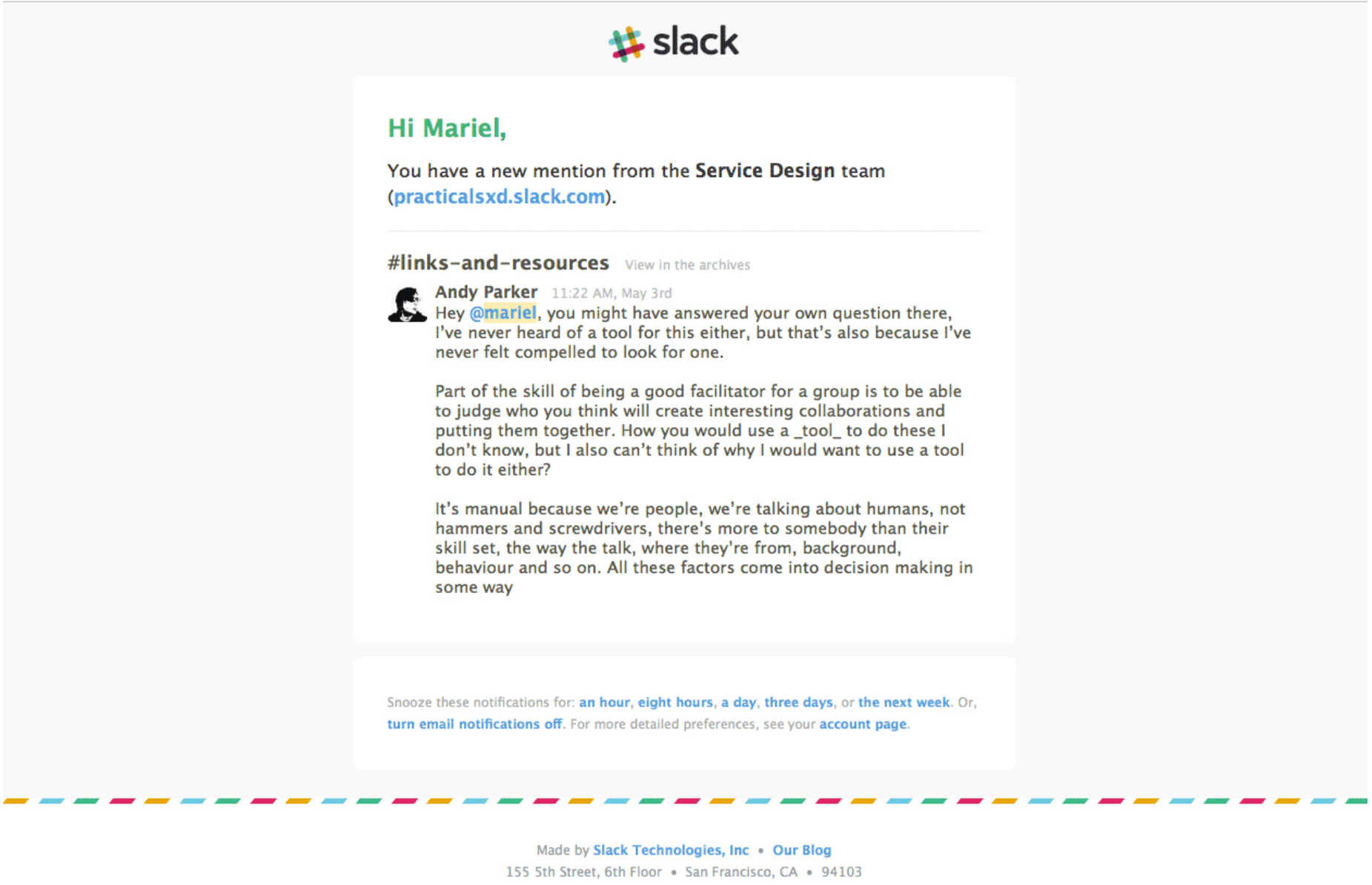


Fig. 24. Doing research about digital tools for group formation.

TEAM FORMATION TIPS

Teamwork and collaboration are important for developing good service concepts. In a co-design environment, the teams should include various areas of expertise and skillsets that complement each other, thus bringing as many different points of view to the case question as possible.

The starting point of the team formation process is to take the participants list and **divide the participants by backgrounds or skills**. Then, the basic requirements that the teams should fulfill are:

- Size: 4 to 5 people
- Different backgrounds and skills, and whenever possible, diversity in age and gender

There are 2 ways to form the teams. One way is that you, as part of the organizers, make them based on the aforementioned requirements. On the event day, the participants will meet their teams. To do so:

- Give each team a name or a number and print the team's name/number together with the participant's name in a name tag
- Ask the participants to "go find their teammates"

The other way is to facilitate a game plan to allow the participants build their own teams:

- Attach a sticker in a shape, an animal, a color or any other recognizable way to the name tags
- Inform the participants of the characteristics of the teams (size and diversity of backgrounds)
- Ask the participants find teammates with name tags of different shapes, animals or colors

This activity should take 10 to 15 minutes.

It is likely that the team members do not know each other. The following questions could ease that first interaction and help them get started working together and with a good group dynamic:

- What is your name?
- What is your background?
- What was the most interesting part of the case question for you?
- If the team does not have a name, their first task could be to make one up

This activity should not take more than 15 to 20 minutes, depending on the size of the group.

Fig. 25.

Additional Features for the ODL Platform

This proposed list has the objective to make the ODL Platform more complete by providing citizens of some functionalities that the competitors currently have. It is not necessary to have all the features in up and running at once, therefore they have been listed in an order of priority where the highest number represents what should be implemented first.

Inspiration

1. App/Idea Catalog with a search function and listing all available projects categorized by type of app/idea/service

Project Creation

1. Create Project
2. Upload Files to Project
3. Add Team to Project

Team Management

1. Create Team
2. Join Team
3. Add Team Member

Other

1. Tutorials for the service creation-related tools, in video. These and the instructive videos should be available on the individual tool or they can build up a FAQ/Help section
2. A forum where citizens can ask for help with specific parts of their projects or make calls for contributions that could result in an informal co-design event

Tools for Facilitators

The following tools were included with the objective to make the role of the facilitators easier:

- **Sign-up to co-design events:** a form made by integrating the Eventbrite API to the ODL Platform
- Team Formation Tips Guide
- Team Management, as specified on this page
- 2-Minute Feedback Template, that the judges can use to evaluate the pitching sessions. This tool was an addition to the Hackathon Starter Kit on the first hackathon event

Testing the Proposed Solution

Ideal Form for Testing

The ideal form for testing the proposed solution would have involved a beta version of the ODL Platform, equipped with the step-by-step guide and the templates and features in the proposed toolbox.

For the co-design context the test could have been to host either a small scale hackathon event in which the Pre-Hack and the Hackathon Phases could be tested, or a simulation of the Hackathon Phase that takes place in fewer hours and focusing on one or more critical moments, for example the Open Data Facilitation; in both cases, in conditions as close to the real event as possible. For the independent context, it could have been a simulation of the journey, totally or partially, with a shorter timeline.

Testing this way would have yielded more precise results in terms of observing the interaction between citizens and Platform in real time, how efficient the step-by-step guide would have been for them, and their experience with respect to the whole process. Unfortunately it was not feasible to implement the guide and the toolbox on the Platform in time to test them prior to the deadline for handing in the thesis.

Actual Form of Testing

As it was not possible to materialize the ideal testing scenario, the proposed solution was tested undertaking a service walkthrough. Arvola, Blomkvist, Holmlid & Pezone (Arvola, Blomkvist, Holmlid & Pezone, 2012) define service walkthrough as something “performed with a physical representation of how a service unfolds over time. It allows designers to explore, evaluate, and communicate service concepts in an embodied and holistic way”.

The physical representation included a paper sketch of the whole process, with every activity in the steps written in post-its, as well as paper templates and cards representing the digital tools the ODL Platform should have. The test participants discussed the process phase by phase and were free to change the order of the steps or rearrange the activities if they saw the need to do it. In each step they reviewed the proposed tools in order to determine whether they are apt to generate the expected outcomes. Empty cards were provided should they wish to add new tools.

The purpose was to validate the solution and to receive the test subjects’ input concerning their overall experience. The main concern was to determine if the steps were in the right order and if their content was not too open or too restricting. Additionally, their impressions with respect to the toolbox were wanted.

Results - Co-design Context

In this test round the participants were representatives from the 3 partners that form the CPH Pilot. Their feedback was focused mostly on Step 0 and the Team Formation as follows.

Step 0

In this step the brief was the centerpiece of discussion. They liked the idea of having the Brief Template as a mean to give pointers and suggest direction; this is because each pilot created briefs differently, depending on their local needs and the stakeholders involved in the process of defining their themes. It was informed that the Brief Template is designed context-specific and allow for reusability in terms of translation to the local languages and changing the look and feel according to the topic of the event. On that note, it was mentioned that all the proposed tools that have been adapted or created specifically for this project can be redesigned if need be.

Furthermore, they thought that together with creating the briefs, this is where they would create the requirements for evaluating the pitches on Step 5, that would also be informed to the hackathon participants throughout the event. This is a suggestion that was implemented in the proposed process. Likewise, a step in which the format of the open data facilitation session is defined after the brief creation was added.

Lastly for this step, they asked if there could be a kind of open mic situation, in which a hackathon participant can present an idea they would like to develop during the hackathon, asking for collaborations. The answer was that this is a possibility, in that the Platform will suggest the Brief Template so that they can organize and create their brief, and there is the possibility to upload datasets should this person have them.

Team Formation

When presented with the Team Formation part of the process and the Team Formation Tips Guide, they asked if the tips would be a wide range of available tips or if these would be derived from extracting information about the people who sign up - for instance to say that there are a lot of programmers but few social scientists. The answer was such an algorithm or an automatic way to do so was not found, and referred to the explanation given in Fig. 24.

They asked if this part could be done by the

Fig. 26. Discussions.

participants rather than the organizer team, as this is the approach they are considering for the next hackathon. They were told that it is contemplated that this part could be done in either manner, and that the Team Formation Tips Guide provides recommendations for both cases.

Overall Feedback

The representatives liked to see how concrete and tangible the process is, with respect to the inputs and outcomes, and how the ODL Platform can support all of the phases. They appreciated especially how the Platform can be used in the Post-Hack Stage, irrespective of what that might look like. They referred to one of their learnings from the first cycle, which is to think about this part of the process already in the Pre-Hack Phase and throughout the Hackathon Phase. Concerning the tools, they did not have any suggestions for improvement at this point.

They mentioned that they have done a lot of thinking about where in the process to implement data, so they found interesting to see how and where data was placed in the process.

After seeing the process from the point of view of the citizens/hackathon participants, they asked about a similar process for the facilitators and specifically concerning the backlog of activities that have to be done to run a hackathon event. They were informed that such a process is out of the scope of the solution, although the importance of the facilitator team was acknowledged.

For the purpose of an upcoming meeting with the rest of the O4C consortium, they considered producing a similar setup as the one for this test (Fig. 28) but with their visual identity, as they considered it an effective way to show how everything works together.

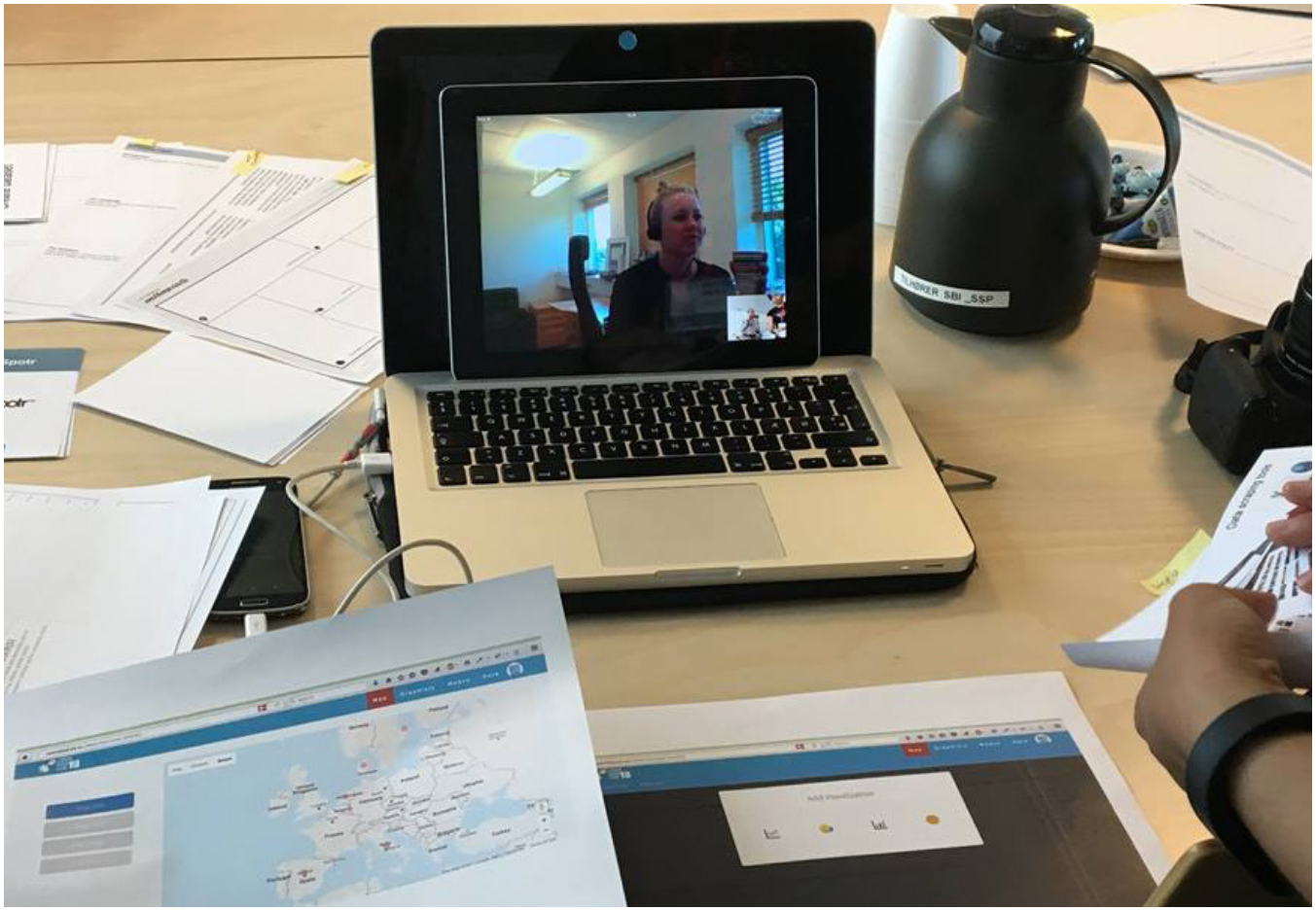


Fig. 27.

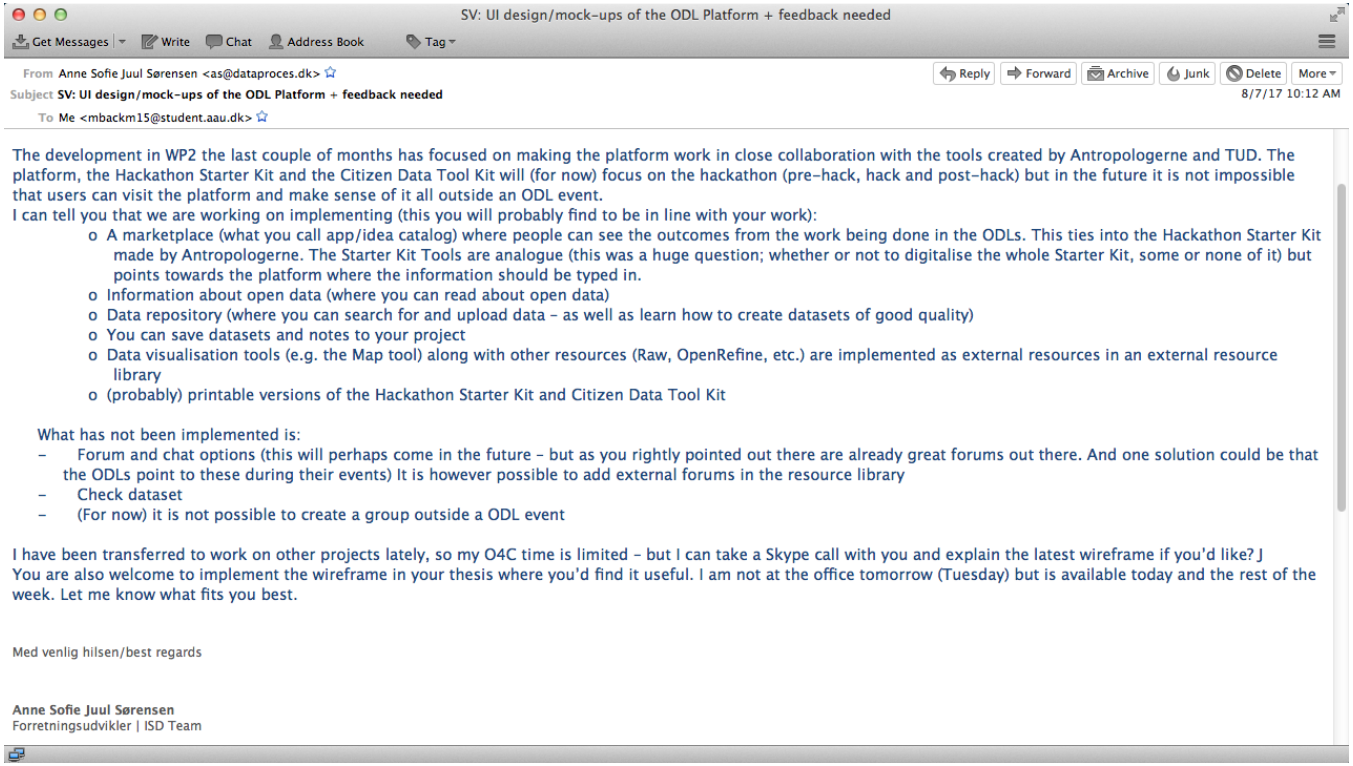

Pre-Hack
Before the Hackathon
Input
Need Definition
Data Exploration
Brief Creation
Registration
Event sign-up
Team Formation
Meeting the Teams
Brief presentation
Step 1: Brainstorming
Step 2: Open data Facilitation
Step 3: concept development
Step 4: Prototype building
Expected outcome ODLP
Expected outcome Process

Fig. 28.

Additional Remarks

It should be noted that there are 2 other ways that could be considered a form of testing or validation for the proposed solution. The first one took place in a Skype meeting that happened early in the Develop phase, where an early draft of the co-design process was presented. The participants in this meeting were Péter Kun (RTM Pilot) and representatives from AAU and Antropologerne. The feedback received from Péter was positive, citing that it was good that each step had tangible outcomes and that it complements what is needed. Dataproces could not participate in this call, so this early draft was e-mailed to them together with the personas and the scenarios.

The second way is the inclusion of some of the features from the initial requirements list that was derived from the scenarios (Fig. 29). These features will be available for the second round of hackathons, thus offering a way to test how useful they are and to get the participants' impression about them. The second round of hackathons is estimated to happen after handing in this thesis report.



SV: UI design/mock-ups of the ODL Platform + feedback needed

Get Messages | Write | Chat | Address Book | Tag

From Anne Sofie Juul Sørensen <as@dataproces.dk>

Subject SV: UI design/mock-ups of the ODL Platform + feedback needed

To Me <mbackm15@student.aau.dk>

Reply | Forward | Archive | Junk | Delete | More

8/7/17 10:12 AM

The development in WP2 the last couple of months has focused on making the platform work in close collaboration with the tools created by Antropologerne and TUD. The platform, the Hackathon Starter Kit and the Citizen Data Tool Kit will (for now) focus on the hackathon (pre-hack, hack and post-hack) but in the future it is not impossible that users can visit the platform and make sense of it all outside an ODL event.
I can tell you that we are working on implementing (this you will probably find to be in line with your work):

- A marketplace (what you call app/idea catalog) where people can see the outcomes from the work being done in the ODLs. This ties into the Hackathon Starter Kit made by Antropologerne. The Starter Kit Tools are analogue (this was a huge question; whether or not to digitalise the whole Starter Kit, some or none of it) but points towards the platform where the information should be typed in.
- Information about open data (where you can read about open data)
- Data repository (where you can search for and upload data – as well as learn how to create datasets of good quality)
- You can save datasets and notes to your project
- Data visualisation tools (e.g. the Map tool) along with other resources (Raw, OpenRefine, etc.) are implemented as external resources in an external resource library
- (probably) printable versions of the Hackathon Starter Kit and Citizen Data Tool Kit

What has not been implemented is:

- Forum and chat options (this will perhaps come in the future – but as you rightly pointed out there are already great forums out there. And one solution could be that the ODLs point to these during their events) It is however possible to add external forums in the resource library
- Check dataset
- (For now) it is not possible to create a group outside a ODL event

I have been transferred to work on other projects lately, so my O4C time is limited – but I can take a Skype call with you and explain the latest wireframe if you'd like? J
You are also welcome to implement the wireframe in your thesis where you'd find it useful. I am not at the office tomorrow (Tuesday) but is available today and the rest of the week. Let me know what fits you best.

Med venlig hilsen/best regards

Anne Sofie Juul Sørensen
Forretningsudvikler | ISD Team

Fig. 29.

Results - Independent Context

For this context the test subjects were 2 citizens from the chosen target group within the target group.

Test Subject 1 (TS1)

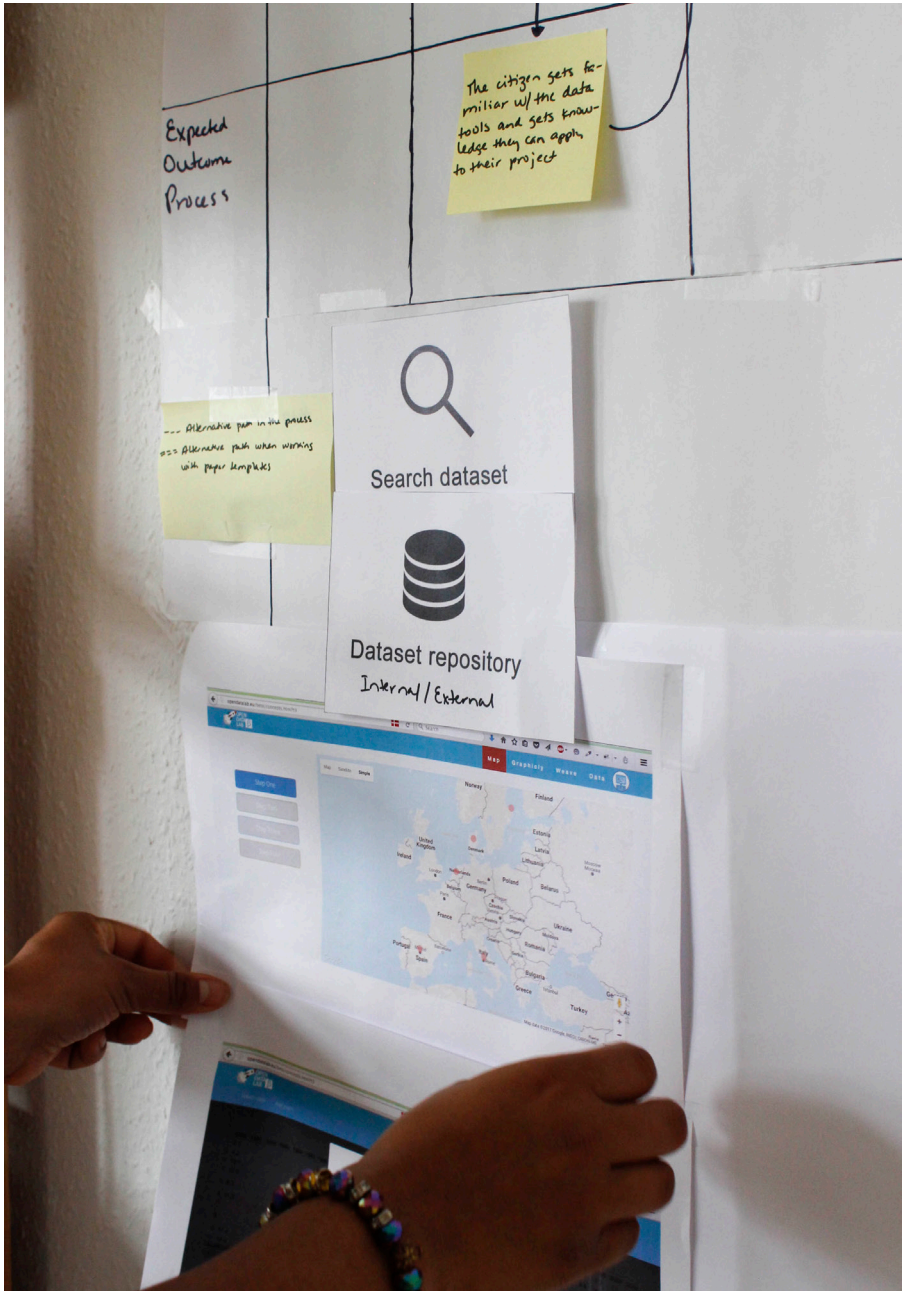
TS1 is a woman in her late 20s with a background of being a caseworker for the municipality in the area of refugee arrivals. She is new to the world of open data. Her input concerned mostly Steps 1 and 2.

Step 1
She thinks that the Inspiration Cards are a very good tool for this step and she liked the examples shown to her. She thinks that there should be a link to the App/Idea Catalog at this step, which would serve to inspire and also to give more examples of services made by “people like her”, or to see if an idea she has is already made and she can find ways to improve it. This suggestion has been implemented in the wireframes on page 108.

Step 2
TS1 finds the Need Definition Tool particularly useful in the activity “The citizen chooses one idea to work with”. The tool could be used to narrow down ideas in terms of making an assessment of which idea has most potential or is more feasible to transform into a service concept. It is a good complement to the Mind Map and the Brainstorming Template.

Overall Feedback
She considers the process to be easy to understand and to follow. The steps are in the right order but the tools need to have tutorials, which she thinks should be on video because a video gives an overview and is a quicker way to show how to do things. Furthermore, she gave some tips for improvement, which are listed on the section Further Development.

Fig. 30. Adding a recommendation for step 1.



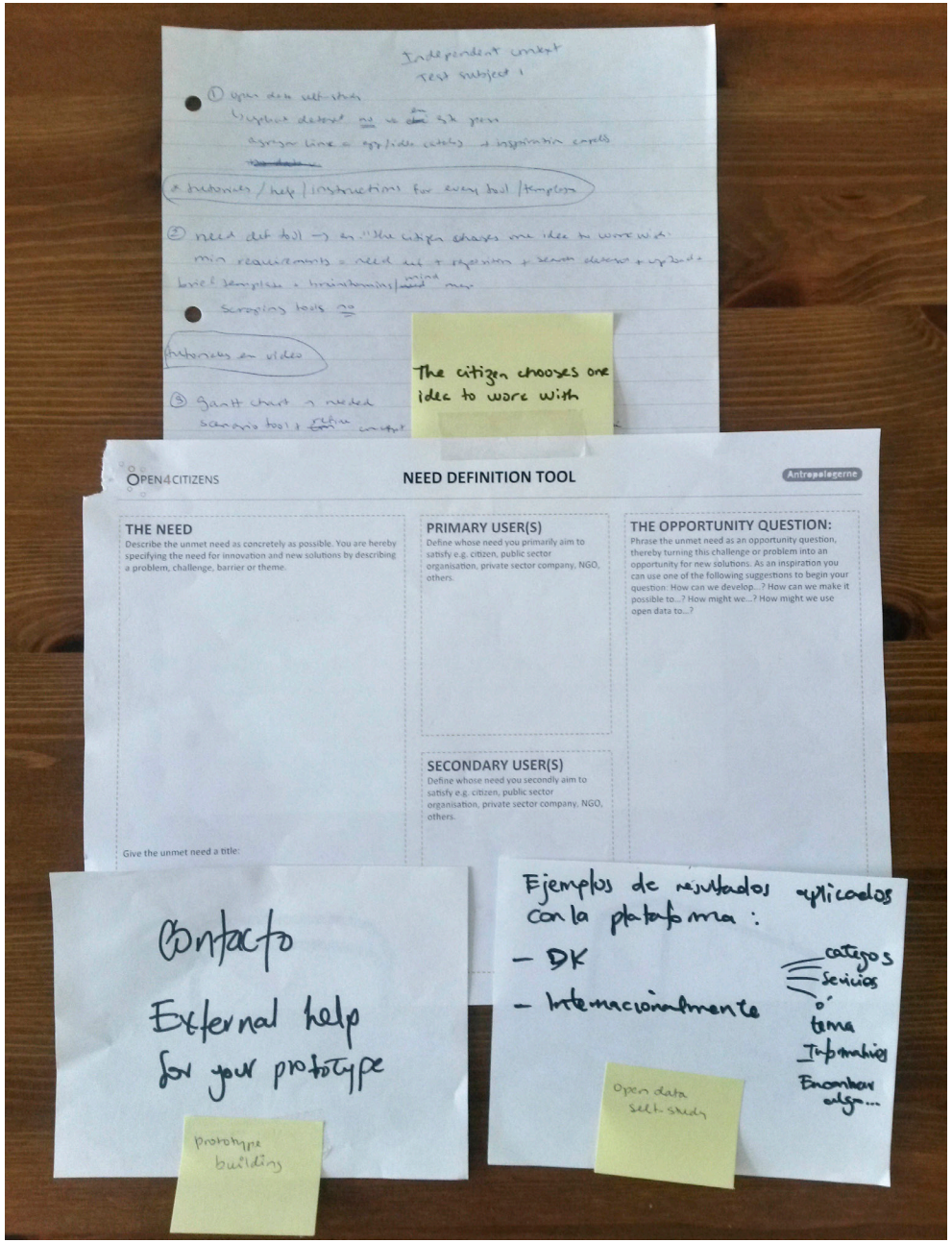


Fig. 31. Choosing tools for step 1.
Fig. 32. Feedback received.

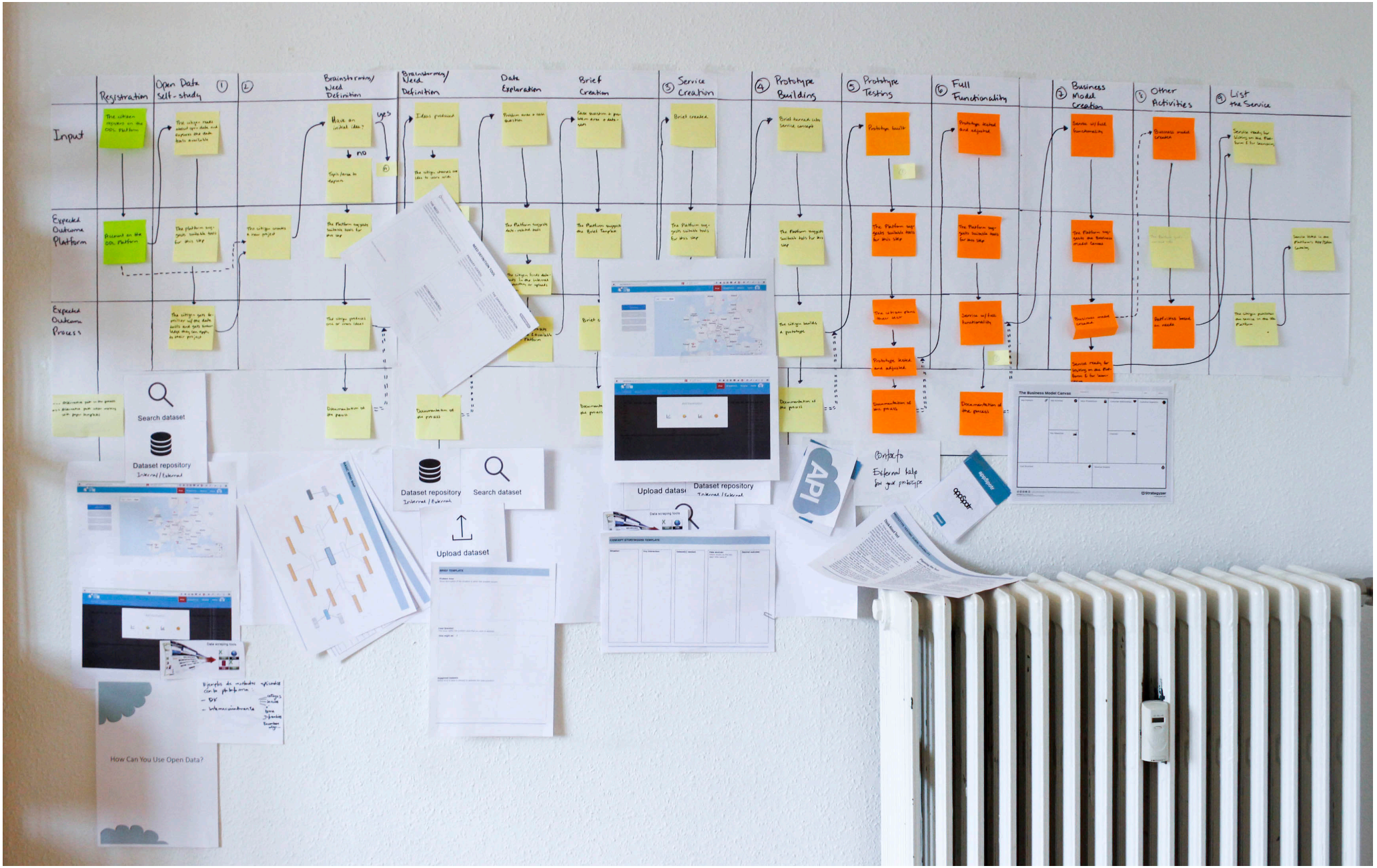


Fig. 33. End result of the test session.

Test Subject 2 (TS2)

TS2 is a man in his early 30s working as a web developer. He knows a little bit about open data. The input he gave was mostly focused on 3 of the steps, as follows.

Step 1
TS2 thinks that the Open Data Self-Study should be done without needing to register on the ODL Platform; this could be a way to attract potential users to its offerings. Should they wish to continue with the whole process and use the templates, then they should register.

Examining the activities and the tools that belong to this step, TS2 finds that it might get too long. He suggests a shorter procedure, in which there should be a tagline that explains in one sentence what open data is, its benefits and what it is used for, and the Inspiration Cards. Regarding the Inspiration Cards, they are very appropriate although some of the examples felt “institutional” for him. That way it is avoided that citizens get bored. With the exception of the cards, he considered the rest of the suggested tools for this step irrelevant, as this part of the process should be about showing what open data is and not what the Platform can do.

Step 3
He finds that the templates in the Service Concept Creation part need examples to

Fig. 34. Examining the tools that belong to Step 1.

provide some instruction in how to use them, in addition to the tutorials that they should have. He adds that it is important to remark that not all the templates need to be used, nor that it is necessary to fill them up with many things. That way the progress feels happening in a quicker manner.

From this step he redesigned the Data Validation Tool as shown on Fig. 35 because in his opinion it takes a lot of work to go from input to output. From a graphic design point of view, the tool should resemble more what is being created, an app or a website, rather than a drawing of cogwheels.

Furthermore, he removed the Customer Journey Canvas and the Stakeholder Map on the premise that they have a level that is too high for a beginner, especially the Canvas. He removed the data-related tools as well, because in his opinion there is no need for further data manipulation since that happened when the brief was created. Should one need to work more with the data, one should go back to Step 2.

Step 5

The Prototype Testing Guide had good tips, but they should have examples that can make the information easier to understand. This was a suggestion that was implemented immediately.

Overall Feedback

It is his opinion that the process is a good idea if anyone wants to make an app, to have guidance from beginning to end. As with TS1, he found that the steps are feasible and in a suitable order. With the suggested tweaks, the tools are more fit for purpose and will help the ODL Platform to achieve the goal it was created for. In addition, he envisioned some other possible uses for the Platform, which are listed on the section Further Development.

Fig. 35 (next page). Redesigning the Data Validation Tool.

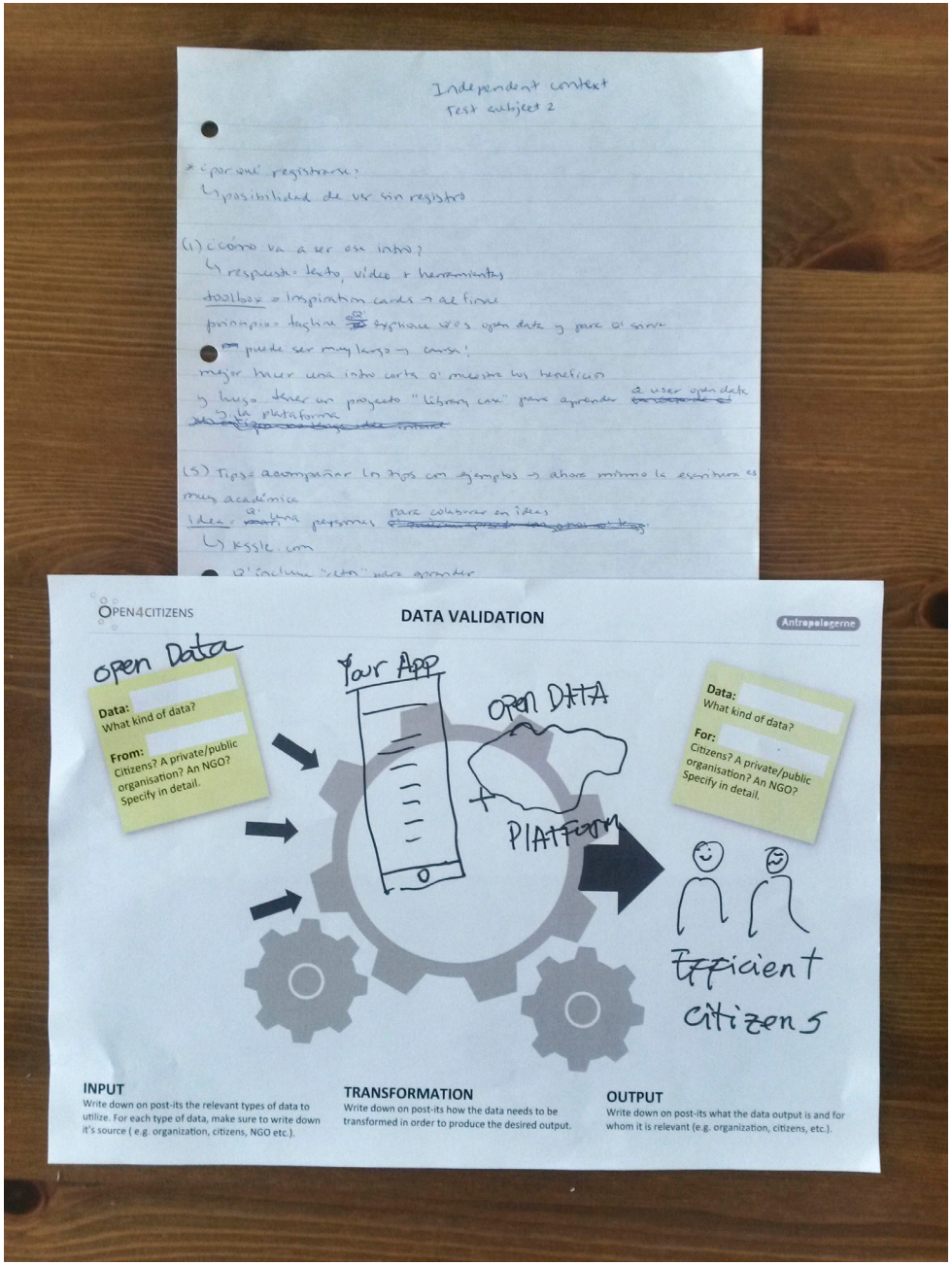


Fig. 36. Feedback received.

Value Proposition of the ODL Platform

The Oxford Dictionary of Marketing defines value proposition as *"the company's core promise of benefits to clients and prospective clients"* (Doyle, 2011). It gives the customer base of the company reason(s) to choose their offerings over other similar existing solutions. With a clear value proposition a company can differentiate themselves from the competitors and position themselves in the minds of the customer base.

After having examined the ODL Platform's current features, the proposed solution and the potential it can have to reach the goal set by O4C, and having assessed the competitors, a value proposition has been created as follows.

"The ODL Platform helps citizens with little to no data skills who want to learn about open data by providing step-by-step guidance and relevant resources, all accessible in one site."

Deliver

- Deliverables
- Further Development
- Reflections on the Proposed Solution

Deliverables

This section explains briefly the reports that have been produced on/as part of this master thesis, and who will be the intended recipients of them.

Product Report that shows the most relevant main insights and deliverables, and suggestions for further development. This report will be sent to Antropologerne and Dataproces, in addition to AAU.

Process Report, showing the journey from research to proposed solution and all the reasons behind the design decisions made. This report will be primarily for AAU, but can be sent to the partners that form the CPH Pilot, or other interested parties within the O4C consortium, upon request.

Proposed Processes in A3 paper size for better readability, in case they need to be printed. This will be sent to all CPH Pilot partners.

Should the CPH Pilot wish to implement other parts of the solution in the ODL Platform, a meeting could be scheduled where a possible action plan could be discussed.

Further Development

The following are recommendations to take into consideration, so as to keep the ODL Platform current and relevant for the target group.

- To review the tools, templates and additional features over time and include new tools and/or templates or improved versions of the ones already present where it is appropriate to do so
- To create more Prototype Testing Guides that show other ways in which citizens can test prototypes
- To add the data tools that the partners at TU Delft (RTM Pilot) were working on at the time of the writing of this thesis
- To evaluate whether the new or improved tools added to the Platform are useful to the target audience
- To further develop the independent context and to test it with the target audience
- To undertake research to determine how the solution can be adapted to the other pilots' needs

The suggestions below were given at the test rounds.

- To implement a "library project video tutorial" with a specific project to make, that will give citizens (especially those without an initial idea) extra guidance through the process of creating an app using the datasets and tools available on the ODL Platform.

The tutorial could resemble the style of the courses available on the learning platform Lynda.com (Fig. 37). In this case each step has its own video; or the steps could be divided into sub-steps, each with its own video. Furthermore, the citizen could use this as a reference that they could go back to, and it could be a way for them to get to know the Platform.

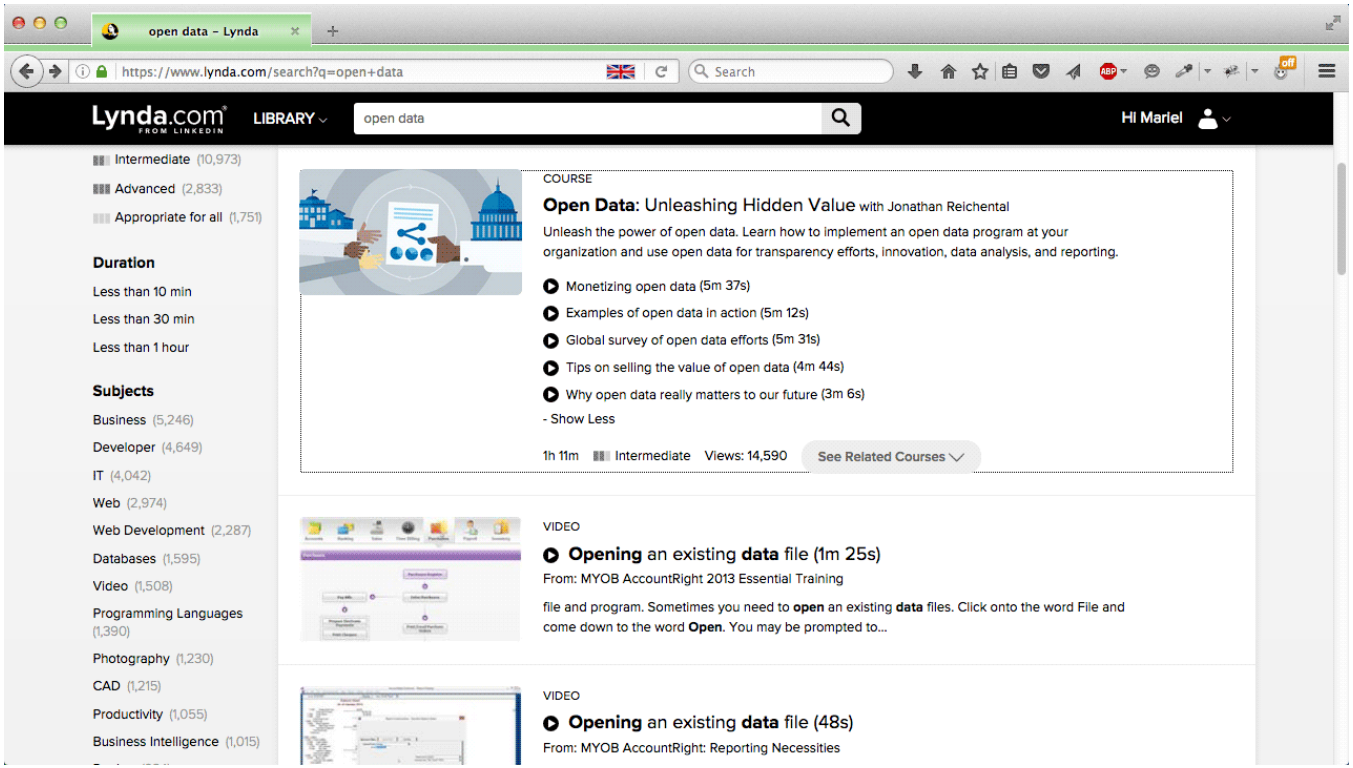


Fig. 37.

- TS1 and TS2 both agree that the Platform should be a mean to connect people with ideas with people who have technical, design or business skills to execute the ideas - which could be beneficial for those who do not wish to go through the whole process but still want to take advantage of learning and realize their ideas in collaboration with others
- To expand the usage of the Platform to uses beyond making apps or creating services. In addition to allowing for collaborations among citizens as explained above, another possible angle could be the citizen who wants to explore data with the intention to find interesting things and/or to create a data visualization on a specific topic for their blog or for a report. This, as well as discovering other scenarios, could be investigated with user research
- The Persona Template and the Scenario Tool could be simplified more and have only the minimum necessary
- To list the contact information of the external resources in case citizens need help building the prototypes
- The App/Idea Catalog should show ideas that are similar or related, based on the tags people use to describe their projects. That way, a sort of connection between the projects' creators could be established, that might lead to collaborations
- To incorporate a project management tool or a way to see what citizens have made and what other activities are left to do to accomplish the steps. This could be accomplished with a progress bar. Some examples of how this bar could look like are shown in Fig. 38

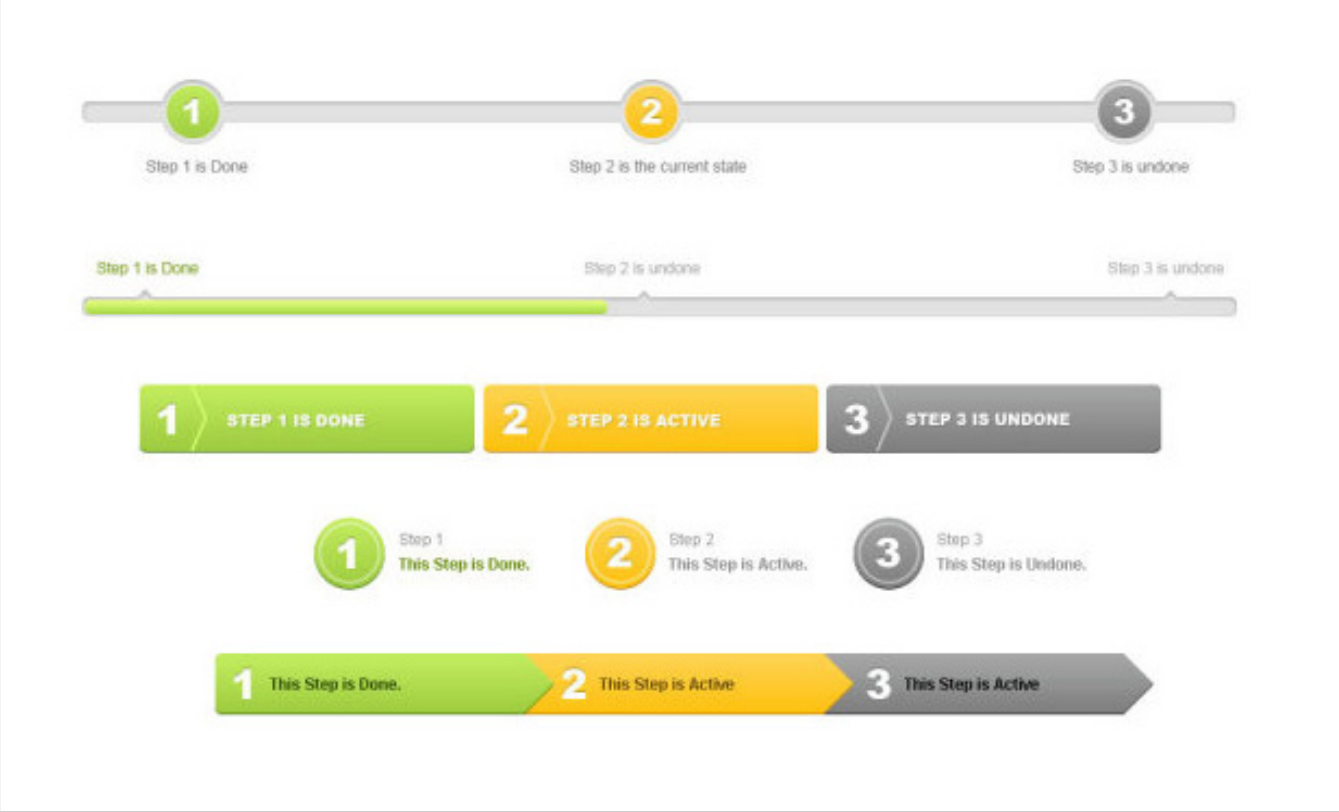


Fig. 38.

Organizations and communities to reach out to after O4C ends

The ODL Platform has the potential to become a powerful tool for learning about open data. As such, it should continue growing:

- In the technical aspect, as it has been suggested earlier in this report, and
- By expanding the CPH Pilot's network with possible stakeholders that can help to carry on with the work that will be done by the time O4C comes to an end

It is thus advised to form collaborations with organizations, such as Open Data DK, Open Knowledge DK, Virk Data, innovation centers, relevant startups, municipalities with focus on smart cities, and events such as TechFestival[14]. Virk Data[15] is a registry managed by the Danish Business Authority; they feature an Open Data School[16], which as of April 2017 was still under development.

In addition, the CPH Pilot could consider reaching out to programming and/or data-related communities. Some examples are, but are not limited to:

- Codher: http://www.codher.com/
- Le Wagon: https://www.meetup.com/Le-Wagon-Copenhagen-Coding-Station/
- GoShareData: https://www.meetup.com/gosharedata/
- cOpenData: https://www.meetup.com/cOpenData/
- CPH Data Drinks: https://www.meetup.com/CPH-Data-Drinks/

14 http://techfestival.co

15 https://data.virk.dk/

16 https://data.virk.dk/open-data-school

Reflections on the Proposed Solution

The aim of this section is to reflect upon 3 aspects that I found particularly interesting and that I kept in mind during the development of the solution.

Bridging the Gap

One of the aims of O4C and the future Open Data Labs is to bridge the gap between the opportunities that open data present and the citizens' capability to make meaningful use of it. In order to do that, they have taken steps to creating the Hackathon Starter Kit of which the ODL Platform is part. Reflecting upon this intention, the first thing I did was to look up the definition of "bridging the gap". The Cambridge Dictionary (Cambridge Dictionary, n.d.) defines it as "to connect two things or to make the difference between them smaller".

Upon examining this definition, it occurred to me that the solution enables the ODL Platform to bridge this gap of technology (open data) and citizens (skills) using design (the proposed solution) as a link between these 2 entities. The solution pursues to lower one big barrier of entry, namely that (open) data is difficult to work with.

It should indeed be acknowledged that data is challenging to work with, not just in knowing how a good dataset looks like, but also on verifying that the information in it is accurate. In addition, there is this preconceived idea that working with data is not for everyone, as has been expressed to me in many occasions, when, in fact, it can be. To that end, the solution suggests tools with a hands-on approach for both learning about data and the creation of services. The data tools produced in this endeavor, and those that are work in progress as of the time of the delivery of this thesis report, attempt to make data easier to understand.

Any citizen, regardless of how tech-savvy they might consider themselves, can follow the Step-by-Step Guide to acquire that knowledge and apply it on the creation of a service that they wish to have. As a result, the ODL Platform becomes a mean to bring this very technical knowledge (open data) closer to the citizens, who will be using a design process along their journey.

As citizens gain this knowledge and start to realize the many possibilities open data offers, it is expected that the aforementioned preconceived idea will change into a more positive outlook to what it is like to work with open data. Over time and after going through the process several times, it is expected that citizens develop critical thinking, so that they can take a bigger ownership of their projects by deciding which tools are relevant for their projects.

Another way to reduce the gap is to make the Platform a medium where citizens with different skills and who wish to work on the same idea can come into contact, as TS1 and TS2 suggested in the testing rounds. This way, a virtual space that promotes collaboration and knowledge sharing could be born. The virtual space would resemble, to a certain extent, the physical space and the environment created for the co-design events, where citizens who can generate ideas are paired with citizens who can program, data experts and from other areas and walks of life. In situations like this, there are good conditions for creativity and innovation to have room to blossom, as citizens take advantage of each other's expertise.

About Creating the Processes

As mentioned in the solution oriented to the co-design process, part of the inspiration used to create this process came from being a part of several co-design events in different capacities. The other part of the inspiration came from my personal story.

I believe that knowledge is what happens when information is applied into a specific case or problem. When I created the processes I considered my own experiences learning how to program and how to design services at AAU. To learn something as technical as open data, and something as abstract as the design of services (as has been my perception up until recently), my thought was that the best approach would be one that is hands-on and as concrete as possible. This can be observed in the practicality of the suggested tools and in the tangibility of the inputs and outputs of the processes processes, which both reflect the influence from my programming background. Furthermore, the proposed processes follow, to a certain degree, an oversimplified service design process.

Because of the timeframe a co-design event normally has, user and/or market research have not been taken into consideration for the solution. Such research usually helps on the creation of personas, but in this case the personas will have to be created based on the information about the problem areas provided in the briefs and basic assumption of whom the target group of the service idea will be. For the independent context, this was not taken into consideration either, as higher priority was given to the other moments in the learning journey.

Special attention was given to what I consider the 2 most critical moments in the journey: Brainstorming and the Open Data Facilitation or Self-Study. Brainstorming has been very challenging for me when starting a project. It is not one of my strongest sides, but the way that I have been able to manage is by placing the topic or the angle in a story-like context, mostly using “how about…?” Hence, the Brainstorming Template is shaped the way it is. It is my point of view that job stories are something that most people can relate to and this makes the template useful, especially within the confines of time limits of a co-design event.

Concerning the Open Data part of the solution. Looking at the co-design context, the decision to make this the second step of the Guide comes from wanting to introduce data as early as possible in the event. I weighed whether it should be before the Brainstorming step or not, but my conclusion was that having the session after the brainstorming could help the teams to filter their initial ideas based on those that have the most potential to be realized during the hackathon - based on the available data and how the teams could transform it and use it in their creative process.

Scarcity or Non-availability of Open Data

One question that arose several times while I was writing this thesis was what to do in cases where open data is scarce or not available. The Open Data Index (Open Knowledge Foundation, n.d.b) shows that countries are taking steps towards opening up more datasets, but it is worth acknowledging that there are some areas that contain sensitive information or that are still locked for political or other reasons.

CPH chose a theme that was challenging in part because of the lack of open data directly relevant to it. One short-term solution that is far from the ideal scenario, should something like this were to happen, in the case of a co-design event could be to create “library datasets”; that is, that data experts in cooperation with the facilitator team make datasets consisting of fictitious information that is good enough to allow service idea generation.

The ODL Platform has a feature called “Send Data Request”, that can be used by citizens if they are in need of a specific dataset the cannot find anywhere, or they do not feel like producing. Service ideas produced from library datasets, together with the “Send Data Request” feature could be a way for the Open Data Labs to start a dialog with the public authorities and over time offer them assistance in their data strategy, as it would give them concrete examples of how this locked data could be used if it was open and published.

Conclusion and Reflections on the Thesis Journey

In this section the thesis will be concluded and there will a reflection upon what has been learned during this thesis process.

Conclusion

After having conducted all the steps in the research phase, a clear understanding of the ODL Platform and the context it lives in has been achieved. It has been learned that there is not one single cause as to why the Platform was underutilized during the first round of hackathons, but rather a combination of challenges in 4 aspects. Reaching that understanding has led to the development of a solution that answers the final problem statement.

The target group for which the solution was developed is citizens with little to no knowledge of data, irrespective of their technical or programming skills. They can use the Platform at a co-design event or independently.

The solution is a process with a flexible structure that turns the Platform into a facilitation tool, providing the target group with a Step-by-Step Guide to learn about open data and to transform an initial idea into a service with data as its core element. To fulfil that role, the Guide includes tools and templates that have a practical approach. Citizens and co-design event participants are encouraged to document their process as they go along, not only for them to remember how they made certain decisions, but because we are in a time where showing the “behind the scenes” is as important as showing the finished product or service.

The process and the Guide were tested with participants from the target group and part of the facilitator team of the CPH Pilot. In each of the 3 testing rounds the solution was well-accepted, and from these sessions a list of recommendations to make the Platform even better was generated. Selected parts of the solution will be implemented in the Platform and used in the second round of hackathons, thus providing another form for testing and adjusting should that need arise.

Implementing the solution will accomplish 2 things. The first one is to differentiate the Platform from similar services. Citadel on the Move, the closest direct competitor, has as main objective to help users in making open data-based apps without any coding whatsoever. In addition, there is a number of indirect competitors with different offerings in their areas.

Websites such as Lynda.com and Coursera are not dedicated to teaching solely open data. There are other data platforms but they focus on being repositories. Virk Data’s initiative Open Data School is still under construction. Where the ODL Platform makes a difference is in combining all these aspects: the learning, the data repositories, the providing of resources to create apps, together with adding a streamlined process and guidance that give concrete outputs - all conveniently located in one place.

The second accomplishment is to reach the goal that O4C and the future Open Data Lab CPH set for themselves, namely to empower citizens to use open data in a meaningful manner. The gap between the possibilities of data and the citizens’ capability to unlock them will be reduced by means of a design process specifically created for this project. The acquisition of skills in these areas will lead to empowerment. An empowered citizen is one with the ability to make better informed decisions that will lead to the improvement of their local communities and, at a larger scale, to the cities they live in. In turn, a welcome side effect will be the transformation from a passive role in the smart city movement to finding areas where they can contribute, thus making them more actively involved and wanting to be a bigger part of it.

As a final note, consideration has been given to one trait that is important to have when starting a learning journey of any kind: motivation. This is something that varies from person to person and that depends on many factors that are beyond what the ODL Platform

can affect. Citizens and co-design event participants will need to have the drive and the patience to complete their journeys. It is not possible to design to keep the motivation level constant, but it is possible to create an attractive proposition that will minimize the risk of low motivation. Furthermore, it will be up to the organizers and facilitators to frame the themes of their co-design events in a manner that is interesting to their intended participants, and to keep that level of interest and enthusiasm throughout the event.

Reflections on the Thesis Journey

Looking back on my thesis journey, I cannot help but look at the two personal goals I set for myself. The first one is "to apply service design knowledge to a business case and to complete a design process individually". Taking on a project like this one was daunting for me at first glance because I was not sure that I had the right amount of skills and knowledge; nevertheless I felt optimistic that I could accomplish this goal and deliver something that I would be satisfied with, especially considering my experience being an intern for the CPH Pilot.

However, unforeseen difficulties occurred along the way, which at times made me question what I was doing and lose the focus. When these obstacles were overcome, they turned out to be major learning points for me. The following are the areas where I feel I grew the most as a professional.

Information

The first obstacle I encountered was the information available and how it did not meet my expectations in regards to what I set out to investigate. There was a plethora of information collected across the five pilots about their experiences with the ODL Platform in the first round of hackathons, however that information did not explain the challenges that the pilots outside of CPH experienced with the Platform and to some extent the Data Validation Tool, which was the only paper data tool of the Hackathon Starter Kit, or why they think these tools were used so little. One example was "I am afraid (the platform was) not used[17]" but there were no reasons as to why.

With the CPH Pilot the situation was slightly different: there was still too much information but with a lot of details about the challenges they experienced. Finding the main issues concerning the ODL Platform and keeping the focus of the thesis, despite having a quite solid initial problem statement, became difficult because of, precisely, the amount of good quality information.

It reminded me of what Poul Kystgaard Hansen said in his Distributed Systems lecture on 23 February 2016: *"Information is not immediately available. The process of retrieving information often takes long time. The retrieval of information often requires a lot of creativity and I think that's a critical one because in many cases we have a tendency to assume that information is available. That's not the case. It would be extremely rare that the information that is needed in a particular task would be available. So you should also kind of steer your mind in the direction as that you actually need to be very creative in generating the information, in getting the best out of what's available*".

Identifying the issues became easier as I applied a systematic process in which I classified anything I considered relevant in categories. I examined each category and it was possible to see patterns that allowed me to put together items that were similar or related to each other, until I had a finalized list of issues.

From this part of the thesis process I learned two things. The first one is not to take for granted that I will find the information I need promptly; and that when I do find said information, it will be in the right amount and it will have the content and quality I need. In any project I happen to work on, it will be up to me to manage what I find or have beforehand and transform it into what I need in order to move on to the next step. The second one is that in the process of producing information with good quality, it is important to be able to discern between what is useful and necessary and what is not, and this is something that can be built on with experience.

Old habits (programming) vs. new habits (design process)

17 Hackathon Evaluation by the Milan Pilot

This hurdle goes hand in hand with part of my second personal goal (in blue), which is "To make good use of my background as a front-end developer and my interest in research and analysis in a service design context".

The way I work has been influenced by my profession of being a front-end programmer. The programming activity requires a clear end result, concrete requirements, structure, and steps that must happen in a certain order, even when writing code because of the way it is executed on the browser. As such, I tend to map out the activities pertinent to any project I work on and carry them out in a specific order, completing one step before moving on the next.

From the first semester of the master studies I perceived the design process as something opposite to what I am used to: it is abstract and to some extent chaotic, with the best representation made by Damien Newman's The Squiggle (Fig. 39). It has been a struggle for me to make sense of the design process, because I missed the structure and sequentiality in it. In an effort to fully grasp how to work with the design process, and remembering what one of my old teachers said one "*sometimes you need to unlearn things in order to make room for new knowledge*[18]", I attempted to unlearn my original way of working outside of the programming world.

In this particular project my old background took over subconsciously a few times and this manifested mainly in several ways. First: I made a preliminary action plan with all the steps that I would take in order to create the best possible solution. This plan was revised and adjusted as I progressed with my work and eventually became the Kanban chart that I used to keep track of the project (Appendix 5). About half way in the thesis timeline, as I updating my Kanban chart, I realized that I could see some similarities between programming and the design process. My chosen methodology, the Double Diamond, consists of four phases which follow a certain order, and at the same time it is flexible enough to allow iterations between the phases as needed, which is what happened in Discover and Define.

I noticed that I could apply the sequentiality of the programming activity, hereby represented by the steps I took and tools I applied, to the design process and use it as a guide that could be changed whenever such a need would arise. For me this was the most important thing I learned from this thesis project; it was the first time that I could see that the old and the new could coexist harmoniously, and that I could achieve the right combination of technical knowledge and design process skills. As a result, my perception of the design process developed into "organized chaos" and this was something I could relate to. I have gained a new appreciation for it, and I understand

Fig. 39: The Design Squiggle.

18 Said at a lecture at my degree in Multimedia Design & Communication from the Copenhagen School of Design and Technology, 2013.

that I do not need to unlearn anything, but rather to incorporate what I know with what I have studied and make my own process that I can tailor to future projects accordingly.

Second: as a programmer I am used to solving all the errors and/or problems presented to me. In this case, I tried to come up with a solution that would solve all the issues I found but one of my supervisors noticed the behavior and advised me that it was not expected of me to solve everything. Concurrently, I understood that this was not possible simply because there are factors outside of the Platform's control, as explained in the conclusion. Instead, I took a step back and offered a solution that addresses the issues in the "Process" and "Facilitation" category, which are the ones where I could do something about. My takeaway from this experience is that the best solution does not necessarily have to solve all the found issues in one try, but one that addresses the most critical issues first and the less critical ones are solved at a later stage.

Communication with the partners

For this thesis I assumed the role of an external consultant who would contact the partners who make up the CPH Pilot whenever the need arises. Thus, communication with them did not happen frequently. In addition to what has already been documented in this report, there were a few Skype calls with Antropologerne at the beginning of the thesis. There was indirect contact in the form of many e-mails that I received from O4C's workspace Basecamp, which at times became a distraction for me especially when I lost my focus. Every now and then, however, I would read a few e-mails to follow their progress. It is here when I noticed that there were some similarities in the work that we have been doing separately, which could be considered a form of validation of my proposed solution.

One reason why I did not have more in contact with them is that I did not feel that I had much to show or to say to them. I was unsure of how to make the most of their areas of expertise, and it is my belief that they were unsure of how to give me support within the frame of making a master thesis, which has a shorter timeline and different scope and objectives than the O4C project.

This is another way in which my habits of working as a front-end programmer manifested. I am used to receiving my tasks and working independently until the website or template is completed and ready to be tested or launched. Therefore, I continued with this pattern after the interview with Dataproces, which was particularly difficult to break or change even though working in multidisciplinary teams is important in the work life as a service designer.

This experience has taught me to agree This experience has taught me to agree on how regularly to communicate with the partners, how (weekly e-mails, Skype calls or other ways), and what the communication should be about (updates about the project, send a deliverable, etc.)

My university education in service design comes to an end with this thesis project and my further education begins with the application of my new skills in the workplace. Not only do I wish to learn other aspects of service design, but I also want to sharpen my current skillset and become a better professional. Although this thesis process was sometimes frustrating, I am glad that I went through it and that I created something that has helped me grow so much.

“What we call the beginning is often the end. And to make an end is to make a beginning. The end is where we start from.”

T. S. Eliot*

* http://www.columbia.edu/itc/history/winter/w3206/edit/tseliotlittlegidding.html

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Internal Documents

Extended Report: report that seeks to reflect upon various aspects of the hackathon process (pre-hack, hackathon and post-hack), with respect to challenges, dissemination activities, stakeholders reached out, approach to the hackathon, etc.

Participant Evaluations: document that the participants filled in to express how satisfied they were with the hackathon, what they gained from it and what could be improved.

Hackathon Crew Evaluations: document that the CPH Pilot filled in to reflect on what was learned and what could be improved after the hackathon was finished.

Picture Sources (Not Created by Me)

Fig. 1. http://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond (modified by me)

Fig. 2. http://open4citizens.eu/

Fig. 3. http://open4citizens.eu/consortium/

Fig. 4. Internal document presented at the O4C Plenary Meeting in Milan Jan 2017 (modified by me by merging 2 graphs)

Fig. 5. http://opendatalab.eu/beta/welcome.html

Fig. 6. http://open4citizens.eu/wp-content/uploads/2016/09/O4C_D2.4_31.05.2016_Final.pdf

Fig. 8. Internal document (Extended Report)

Fig. 9. http://publicdata.eu/dataset?groups=finance (received in various different parts of the website)

Fig. 15. Wireframes provided by Dataproces and adapted by me.
- Avatar from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Download icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Help icon ("?") from http://www.freepik.com/free-vector/100-universal-icons_993473.htm (adapted by me)

Fig. 17. Wireframes provided by Dataproces and adapted by me.
- Avatar from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Download icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Help icon ("?") from http://www.freepik.com/free-vector/100-universal-icons_993473.htm (adapted by me)
- Video icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (composite made by me)

Fig. 18. Adaptation of the briefs observed at Open Tourism Days

Fig. 20. Adaptation of a template used at the Copenhagen Service Jam 2017 http://www.copenhagenservicejam.com/

Fig. 21. Adaptation of a template used at the Copenhagen Service Jam 2017 http://www.copenhagenservicejam.com/

Fig. 22. Adaptation of the Persona template at http://xtensio.com/

Fig. 23b. Adaptation of the Usability Test Plan Dashboard created by User Focus (Travis, 2013)

Fig. 25. Graphic from http://www.freepik.com/free-vector/businesspeople-working-together_946832.htm (modified by me)

Fig. 27. Photo from https://www.facebook.com/Antropologerne/posts/1465231663545152

Fig. 28. Image from http://freedesignfile.com/23559-website-progress-bar-psd-material/

Fig. 39. http://cargocollective.com/central/The-Design-Squiggle

Graphic at Facilitator Profile: http://masterfulfacilitation.com/social/wp-content/uploads/2014/09/facilitation-chart-male-group.jpg

Appendixes

- **Appendix 1:** Transcript of the Interview with Dataproces
- **Appendix 2:** Complete List of Challenges Using the ODL Platform
- **Appendix 3:** Field Research at Open Tourism Days
- **Appendix 4:** Evolution of the Proposed Process and Original Step-by-Step Guides
- **Appendix 5:** Thesis Timeline and Project Management with Kanban

Appendix 1: Transcript of the Interview with Dataproces

Interview via Skype that took place on 20 February 2017. The interviewees were Anne Sofie Juul Sørensen and Mehdi Ben Taarit.

Mariel (M): Which of the hackathons did you go to?
Dataproces (D): All of them.

M: What were the specific characteristics of each hackathon (other than the themes)?
D: The organization, the tools that have been used, the output result for each hackathon.

M: Could you elaborate on the process? I understand that there's a baseline designed for O4C but that there were some deviations.
D: It all comes to what you want to get out of the hackathon. Some of the pilots wanted to have what Antropologerne has created. For ex. CPH was more or less following the rules, let's put it that way. They followed the starter kit and used it. If you grade the different pilots in terms of how much they used the starter kit then I think definitely CPH was the one that followed the outline the closest.

The other pilots chose to work with some of the tools while dropping other tools. They chose to have a different output instead of having an idea. They wanted to have an application, so they changed the whole thing based on the people that was gonna attend, their background, whether they're tech-savvy or not tech-savvy, and whether to focus on coding or on brainstorming. Those are the main factors on how the different pilots are different.

M: Is it meant that the process was supposed to be followed like CPH, like everyone would have to get the same output or is it thought that every pilot would have to manage?
D: I think that every pilot has the freedom to do as they feel is the best for their hackathons but the thing is that in the end there has to be a deliverable called the Citizen Data Toolkit (CDT). The starter kit is the first iteration of this tool package and I think, as far as I know, that this CDT is meant to be something that you can hand on to somebody else and say "ok, do you want to run an O4C hackathon? Here you go, here's the tools you need, here's the manual. Go nuts!"

M: What were the challenges of each hackathon, to the extent that you could observe?
D: There are different levels of challenges, I think, and it relates to the process. One of the first ones we observed was the group formation.

In a context-related aspect CPH was challenged with the theme (integration). What I have found the most challenging is to create a platform in the middle of all this. Because there are 5 so different ways of handling the O4C hackathon and 5 very different outcomes and I can't seem to find out if this is something that happened accidentally. I really want to make something that's generic and that's why we ended with the design that we did because in a way we're designing for a moving target. Also we're dealing with 5 different cultures and not only skillsets, 5 different maturity situations of the open data scene, the different themes.

From a platform perspective it has to be able to navigate, be very flexible but at the same time offer something rigid and that's why we took it that we have to cover the novice, the intermediate and the expert users. But then in the hackathons we found out that people bring their own tools. Expert users will bring whatever coding systems or software that they have. It would be in a way redundant to offer expert tools for them because they will of course go and use whatever they have preferred.

The ones who don't really know about data don't really have time in the hackathon to go and read about all the data and how you

manipulate it, how you clean it, so we found out that this is something you would do in a pre-hack or at least in the time before the hackathon. That also requires something of the pilots, so that they would go and tell the users: “we’re running this hackathon and we need you to prepare this or you have the possibility to look into this”. Because they also have to look at asking people to do “homework” before the hackathon. Is that something they want?

So that is also different between the 5 pilots. To me as a UX Designer it has proven to be a much bigger and much more rich project *(sic)* than I would ever have thought it would be.

M: What were the challenges of using the platform?
D: I think one of the things is that it was quite disconnected from the actual hackathons. Also because there are so different professional competences, like when normally when I design something I want to have a specific goal or vision laid down for the software that is developed but due to the research aspect it was quite difficult to actually put anything down other than “ok, we need a repository”.

As we went with that idea we found out that there are lot of open data repositories out there, so it would be redundant to make another one and then we started to work more on the idea but in order to have something that was ready for the hackathons we need to move faster than what the hackathon planning was going. I think it became a bit skewed but we included the learning aspect in explaining what open data is, we included the visualization; we had a lot of demands that came in early like the data visualization, data manipulation, stuff like that.

So all of that is put together in the first version of the platform but I think that the closer we came to the hackathons, the more concrete the requirements came but we needed to stick with something already or else we would have nothing.

We needed to get to the iterative aspect of it so that we could have something that we could present and then get some feedback and then we could feed it into the development process, so it would have been nice if you had a first round of hackathons and then you started to program something that “we’re missing this for the process”, or “we see that this is missing in the Open Data Lab (ODL)”, stuff like that. But one thing is that the ideal scenario and then there’s the reality.

M: How much was the platform used in each hackathon?
D: I think in some of the other hackathons the data owners would bring the data themselves and they would tell about it, present it and there was no need to go to the platform and get the data because they got it elsewhere. And also with the aspect that I told you about the non tech participants didn’t have time to go there and start reading about open data.

I think somewhat more attention to the platform as part of the process would be good but I also think that now that we have a clear idea about who is using the platform, what they will actually be using it for, that’s where the *(Ed. it was not possible to understand what was said here)* the hackathon starter toolkit comes into perspective and that’s one of the things that would make sense to have in the platform.

And the main reason why the platform was not used is the process was not including the platform. For example in CPH the facilitator presented the ODL Platform and the reason why it was not used is actually it was not included in the process. It means that first you had to come up with the idea and then you had to come up with the argument for the idea, it was a whole process that you follow except putting the platform. And that is why because the platform is more focused on analyzing the data, on giving a visual understanding of the data, but the hackathon was only to come up with a new idea.

It was brainstorming and then when you were supposed to use the platform the event was over. In that way it became redundant and that’s why we’re going to include all of the tools in the platform, so the platform can be used during the hackathon for these purposes, and then if the event is over you still know the platform because you have already played with it and you have some information or data or whatever that you have created inside the

platform. And if you want you can come back anytime because it's a platform and it's on the web anytime and continue working on your idea with the other tools. That is our vision and that is what we're hoping to go with.

M: Which of the hackathons used the platform?
D: None used the platform for the reason we built the platform for. Because the process missed totally the platform and the 2 things were developed separately, because of the speed of the 2, when we had to be done... it was supposed to be parallel but because you need to code, so we needed to do and have something concrete.

M: Which of the hackathons had data owners present?
D: BCN. KSD made a really cool thing with folders that they sent to the participants prior to the hackathon, containing the challenges, the data. A prepped package so the teams knew what is the data they would be working with, the challenges described, that is really cool so we have been looking at that and maybe doing something with that or getting inspired by that.

MIL had the Municipality as a stakeholder but not the data owner.

But it also depends on how the structure of the hackathon is put up. In some of them it seemed more broad, "just use open data", whatever is available online. The one in BCN was more focused on the ones that owned the data, making the city safer for bikers, to create awareness about drugs and also creating a map for pollen emission for the people who have allergies so they can avoid those places and then maybe coupling it with the medicine that goes the best for this type of allergy. But they were all ideas.

M: Did they do any coding in BCN?
D: No, they only did some mock-ups.

M: So the coding hackathons would have been KSD and MIL?
D: MIL was the only coding hackathon. There was some coding in KSD but not for an end point to application as we've seen it in MIL but we didn't see any application or final product. I think this was for experimental thing where the coding was done by coders because they had invited different participants, for example data scientists who explained the data; they had one data scientist for each group and there were divided into 4 groups. I think they added developers and I think actually one of them was the same data scientist that was explaining the data and showing what you can do. There wasn't a final project, just mock-ups.

In MIL you had different applications that worked.

M: How much data was actually used?
D: Not as much as - only MIL. But the data was used for example in KSD to understand, to come up with the concepts. I think it depends on what one means with "data was used". In all places they referred to data or at least to the concept of open data but in MIL they were using the actual data. In BCN they were using the actual data to create concepts, but they weren't coding. You could actually use the data without coding to come up with a result, to come up with ideas, to come up with conclusions.

M: What is the ODL Platform meant to be used for?
D: The reason for ODL Platform to make up come up with ideas. The tool that is implemented into the platform is analyzing tool, the visualization tool, as explanation tool. All of this goes to coming up with ideas, to help brainstorm. The coding and all the application building will go on outside the platform.

The next version of the platform will focus on helping the participants generate ideas and it does not because the version that is online right now, the way it's constructed is so it will lead the participant on and show him the way. First you start out with building insights, you gain knowledge about what open data is and then you move on to gaining understanding of the data through data visualization and analysis, and then you move on to creating your concept using Balsamiq as one of the tools we have linked to or using Bluemix which is also a platform IBM has made and that we're also linking to.

But what we are thinking is that the next version should embrace the idea generation, the construction of... actually a laboratory where you can go as a user and start doing things and gaining understanding of data.

Basically the next version of the platform will be the same as the first one but including more powerful tools and allowing the participant to start from the beginning. That means including some of the starter kit into the platform. In that case you would have one place only to go to, to get the knowledge of open data and especially to work in a hackathon knowing how to organize a hackathon from beginning to end, how it is to be a facilitator and how it is to be a participant.

That's also why we want to do the registration in the platform, or at least so that you have a profile and you can return to the platform, and log in and you'll have the information you have typed in from the hackathon or prepare during the pre-hack or whatever, so that the participant would start getting familiar with the platform.

That's what we want, to allow people to do and be curious inside the platform and try it at the hackathons, but it also takes that we work closely together with the pilots to explain to them *(Ed. an internet connection problem makes some words hard to understand)* to their participants and link to the platform where they will log in, where all the data labs should be facilitating the hackathons through the platform so there is also a bit of communication from our side on how we imagine it and how it should be with the hackathon process.

M: When we were talking last time I remember that you identified 2 possible groups: the facilitator of the hackathon and the participant. Which other potential target groups for the platform could there be?
D: For now we don't actually see. Only 2 main users: the facilitator and the participant. Then the participants can be NGOs coming in, students, teachers, lecturers, caseworkers, municipalities... but we have decided to put them under the same umbrella and call them participants. But that is from our perspective whereas I think a lot of the pilots will benefit from widening the perspective more to "what do we want from the NGOs?" "What do we want from the municipality?"... And the data owners can they bring challenges? But to keep it simple to make the back-end more structured, and to have the structure laid out we need to have those 2 groups.

M: How much work you had to do when the pilots came to you with the datasets, to make them usable?
D: Some of the pilots actually knew before they even came with the data and because it was quite undefined what "open data" actually was, I know some saw it as whatever is online, what I could call public data, the available data but there is someone who owns it. Whereas open data in the core sense of the word is data that belongs to the citizens or the municipalities. When we had datasets coming in then we tried to make them as simple as we could for the end user. For instance, if we got a really large dataset containing a lot of years - like pollen data from 2014, 2015, 2016 then we would divide them into 2014 - that's one dataset, 2015 that would be another and 2016, so that it would be easier to construct something from it.

That is what we call data filtering and organization of the data, so basically a pilot contacts you with a list of datasets that they have - there could be good data or rubbish data - and they want us to filter the data and upload the data to the platform. It's our job to do that and we prefer to have a notice *(?)* of the datasets we're going to handle, so we said you need to tell us about the data minimum 3 weeks before the hackathon for us to do the work.

We do work on the datasets and we need the time to work on that.

Not everything is ready to use and that's also the thing about data. It might be that not every detail is typed in like you have in an Excel sheet, there is data missing, it is wrong - for example if we have locations the X and Y coordinates would be swapped. It's up to us to filter now and there are lot of different inconsistencies.

M: How much of a problem could this data filtering be in the future (for ex. after the O4C project has finished and the ODL will continue)?
D: In that case it is up to the facilitator to clean their own data and upload it because our job includes to facilitate the hackathon and one of them is of course - so we're a facilitator, we clean the data, we upload the data. In the future if a facilitator wants to upload the data s/he needs to clean the data and filter the data and then upload it to the platform. It's outside of our scope.

What could be the best thing would be to empower the citizens to learn how to clean their own data, to be able to handle the data and to spot "oh, there's something in this dataset that is wrong - I have to figure out what it is and what to do in order to use it in the concept or the solution".

Imagine having that power, that you can tell your citizens: "if you want to use this then you have to look for this, and this, and this", but it's statistics and number crunching and not everybody has a flair for it or the motivation to do it.

If we think about the different tools we're implementing in the new version and the construct *(sic)* or how to look at the dataset, how to prepare a dataset, that would be a tool but it requires that you sit down and you study. That's why not everybody can be a facilitator.

M: What are the requirements a facilitator should fulfill?
D: That you know how to handle data, know what the hackathon you want to process is and basically we're not gonna offer the facilitator login and password to anybody wants to register as a facilitator. It will be approved by us or whoever is in control of the platform because a facilitator is for now linked to the pilot. In the future it needs more plan on how to do that, and I don't see as in the future unless you're organizing hackathons and everything, so we're talking about out of the O4C scope and a new business model which is not included in this project and I don't think we should focus on that at the moment.

You need to be part of the hackathon organizer, you know the data that you need to upload - whether it's clean or not, and the format you need to be in relation of the theme of the data. Say that you need to be of the selected team, approved.

M: How do I become part of the selected team?
D: Talk to Amalia (*Ed. De Götzen - associate professor at AAU)*.

M: What did work in the hackathons and the platform?
D: I think that the possibility that you have inside the platform for now. If they were highlighted during the pre-hack, the hack and the post-hack, it actually allows the participants to do quite a lot. Of course it has to be refined but I think that something that really works is the process that we have put down and the stepping stones. It needs to be tested and we think that is the right way but it still needs to be tested. And as Anne Sofie puts it, the knowledge that you can gain on open data, and that is the whole theme of the project.

M: You were saying that some of the pilots have a level of maturity when it comes to open data. Where is each pilot in that regard?
D: Italy have the transparency thing going on, they have the open data available on the municipality website. The thing is that you have to be very very patient and know where to find it - it's not like it's in a portal or something. It's there but you need to know the process of the entire municipality and the case working, in order to get to the data. So they need transparency in order to the data more available to the citizens who actually require it.

In terms of where the other pilots are I think Denmark is quite advanced in the open data scene, but the thing is that a lot of the data that is out is not really being used because people don't know what to use it for, some of it is getting old, you can't really use it. I don't know about the other pilots, how they would describe it.

It differs from one country to another, you cannot expect to find open data maturity. For

example in Italy there is open data, not all of the data that should be open is open and if it's open it's not quite easy to understand. In other places the data is not there in the government or other places where it should be but it's there in other repositories. The maturity of open data is still yet to determine because it's a new thing, so everybody is stumbling and trying to understand it and that's why you have different characteristics and different understanding of open data. Every country and every organization interprets it as they think open data is.

M: Thank your for your time and your help.

Appendix 2: Complete List of Challenges Using the ODL Platform

Source of the challenges: Observations | Participant feedback | Hackathon crew evaluation

People	Facilitation	Process	Data	Tech	Other
Not many programmers in the event	Most of the CPH team was not familiar with how the ODL Platform works or how to work with open data	The hackathon (event) process looked more like a service jam, which is one of the strengths of the CPH pilot	Data about integration and migrants is not open due to privacy reasons		
Those with a (service) design/IT background brought in their own tools or used their own methods	Little interaction between the data experts on the second day and the participants	The CPH team could not start the hackathon using the ODL Platform, because the ideas generated at the pre-hack workshop could not be worked further			
	Few participants were observed using the ODL Platform				
	“I didn’t feel the use of data was very well guided. Not everybody has a clear idea on how to use it”	It was challenging to think with data in mind	Most participants felt that they needed relevant existing data	“The assistance from the robot is unclear. Maybe it would be nice to see more free tools”	
	“If people from ODL or other data experts are invited again, it would be good if they could spend time with each of our groups and help us understand how open data could be useful in our projects”	How to include or use open data: more examples. It seemed pushed in the background		“I wasn’t able to share and export my project from Balsamiq”	

People	Facilitation	Process	Data	Tech	Other
	Difficult to use the experts that attended	“I forgot about it (ODL Platform) and it wasn’t part of all the templates we received for developing the idea”			
		Time pressure (this was expressed by several participants)			
		The time and organization. Less templates and more doing			
		The amount of tools could be reduced or presented from the beginning			
		“I think it was a bit of a shame that we had to start developing ideas before we got to hear more about open data”			
No “in-team” data-wizards to advise on how to tweak the topic appropriately	The facilitator team did not know the ODL Platform and the resources well enough to facilitate its use	Not many ideas, if any, had data as a core element	Availability of data: there were not many specific open datasets on migrants		The theme in itself (integration) was more attractive to citizens/activists than programmers or open data experts
Hackers/programmers not in the CPH team’s network and could not be reached out properly	Little interaction between the data experts on the second day and the participants	It was tough to get the theme fit with concepts including open data			

People	Facilitation	Process	Data	Tech	Other
The data owners should be involved and the focus should be sharper: need defined, datasets + data owners at the hackathon, start from the data side	It seemed difficult to make the data experts interact/help the groups	The ODL Platform and the open data introduction were detached from the flow of the hackathon			
It would have been ideal to have data come much more into play during the event, and data owners much more actively involved in the hackathon and in defining the topic to be explored early on	There were data experts available on the second day but it seemed difficult for them to help the groups. Perhaps they should have been involved in the preparation and discuss how they could facilitate	The process the participants go through is quite detached from the online tools provided			
	Dataproces could be more actively engaged, e.g. facilitating particular “data stuff”	The event was very “design/service jam”-oriented, which is at the core of what Antropologerne and AAU are able to support			
	The participants did not know what (data) questions to ask during the hackathon	The toolkit does not allow for data exploration			

Appendix 3: Field Research at Open Tourism Days

The field research at this hackathon event consisted of observations and semi-structured interviews as follows. The focus of the observations was the general dynamics of the hackathon while the interviews were about the case definition and used tools.

Observations

The teams were formed by the hackathon participants based upon the following process.

1. The participants received name tags in different colors, each color symbolizing a specific background or skillset:
   - Blue = developers/programmers
   - Green = tourism
   - Yellow = designers
   - Purple = business
2. After the case owners presented their cases, the participants were told to approach the different case owners and ask them further questions, upon which they would individually decide which case they wanted to work with
3. Within those who wanted to work on the same case they would build teams of 4-6 members, focusing on making an interdisciplinary team with complementary skillsets. However, people who signed up as a team will keep that team for the hackathon
4. When the groups were formed they could talk to the case owner of their chosen case further

How to Choose a Case

- Each case owner has 15 minutes to present their case. The cases were also published on the website prior to the hackathon and also available on big posters in the work room
- Once all the cases were introduced, the participants had 15 minutes to ask further questions to the case owners (as previously described)

Various Observations

- The OTD website acted as a sort of single point of contact for the event, where the hackathon participants had access to the cases, links to the datasets, tools for data handling and coding that could be used, and other relevant info
- The first day started with a presentation about what is expected to happen during the whole weekend, as well as some practical information. For example, they were informed that there would be 2 winning teams. As part of this presentation the participants were given the criteria to choose the 2 winners:
  - Use of data
  - Customer validation/usability
  - Innovation
  - Realizability
- The participants had access to mentors to help them with their solutions. The mentors were from different areas that were relevant for the theme: tourism, law/ intellectual property, programming (web, software, etc.), business, marketing, design, and data
- The staff and mentors were very clearly identified by name tags with different colors: red for the staff and orange for the mentors
- The hackathon felt free form, possibly due to the following factors:
  - There were several energizers
  - The presentations by Open Data DK were entertaining and informative at the same time, and they contained funny visuals to transmit important information (for ex. short animations, funny pictures)
  - The schedule had structure but was not rigid
  - There were not many tools or templates to use during the hackathon. OTD suggested some tools to use, which were linked from the website, but the participants were free to use whichever

tool they preferred

- The participants had access to the cases and the datasets, as well as other relevant info prior to the event on the OTD website

- The mentors were prepared by receiving a 10-15 minute brief prior to being introduced to the participants. They were told what is expected to happen at the hackathon. They were told to spend some time with the groups. There would be no dedicated mentor to any specific group
- The participants had a status report where they spoke about their ideas, how far they were working with them and what they needed help with. Then the mentors introduced themselves and the areas they can help with, after which the groups chose which mentors they wanted to work with
- During the second day the groups were still on the early stages of concept creation, although some groups were more advanced than others. However, it was observed that the groups started brainstorming solutions from the question that the case they chose had and then integrated data, rather than start from the data available within the case they chose to create solutions. The groups' one-minute presentations to the mentor support this observation

Semi-Structured Interviews
Interview Guide

1. Which tools for data exploration/ visualization and/or building the solutions were used in the hackathon?
   a) Were those tools offered by Open Tourism Days or were there other tools used? If so, which ones?
   b) Who facilitated the use of the tools suggested by Open Tourism Days during the hackathon, if applicable?
2. How were the cases made?
   a) Who formed the cases?
   b) Who else was involved in the case definition, if applicable?
   c) Which was the starting point of the case definition?
   d) Who came up with the suggestions for data for the cases?
3. Are the datasets placed somewhere or will the data be scraped? Where are the datasets available?

Interview with Camila from Open Data DK
(2a) The cases were created as a collaboration between Wonderful Copenhagen (WoCo) and Open Data DK. WoCo pitched the cases to get funding but did not get it. They had the open data integration in mind, but the cases were originally drafted from a tourism organization perspective.

Open Data DK helped to reshape the cases from the point of view of the tourists for the purpose of the hackathon event.

(2b) Just the case owners and Open Data DK.

(2c) The cases were started with the issue. Finding a problem is more critical than defining the case. Start with the "why". "Why are we doing this?"

(2d) The case owners + Open Data DK.

(3) The repository at opendata.dk and links to external repositories on opentourismdays.dk, but there will be a session by Dexi.io using their scraping tool. Participants can also find data on their own.

Interview with Michael Johansen, case owner from VisitDenmark
(2a and 2b) The case was created solely by VisitDenmark but it is a common problem that we are working on.

(2c) VisitDenmark was very interested in adding the "GuideDanmark"* data which is owned by The Digital Partnership (a collaboration between many Visits-organisations in Denmark). So:

- We knew we would add GuideDanmark data first
- Then we wrote a case regarding a VisitDenmark issue
- Then we added more data to support that specific case

I think the other organizations had another approach and started with the cases but I am not sure. We tried not to influence the groups that much, to get as innovative answers as possible.

(2d) VisitDenmark had a good idea about the data they wanted to use, since their process for defining the case started from the data available, see question 2c.

Interview with Trine Lundorf, case owner from VisitAarhus
(2a and 2b) The case was defined in collaboration between 3 people, including Trine, from VisitAarhus and OTD.

(2c) I think a bit of both. You think about which problems which needs to be solved – but you do it with the types of data available in mind.

(2d) Mostly the team behind OTD.

Interview with Helle Christoffersen, case owner from Frederiksberg Municipality
(2a and 2b) The case was initially formulated by the city of Frederiksberg but qualified by Wonderful Copenhagen and the Open Data DK team.

(2c) The starting point was with no doubt the issue. This should always in our opinion be the starting point – what problem do we seek to solve? Are there any data which can enlighten the issue – even from a different perspective?

(2d) Primarily Wonderful Copenhagen.

Interview with Birgitte from Open Data DK
(1 and 1a) We were supposed to have three technology sessions – one by IBM, one by Dexi.io (webscraping) and one by Open Data DK, but unfortunately IBM and Dexi.io were sadly at the last minute not able to be there.
We have planned to have the technology sessions with the purpose to present relevant tools to the participants. Frans from Open Data DK did not make a technology session, but chose to walk around and talk to the groups about data and tools.

I am not totally aware of what tools the groups ended up using, as I was not present at the presentation Sunday afternoon. Apart from that we from Open Data DK do not focus that much on which tools they used, but rather which data they used.

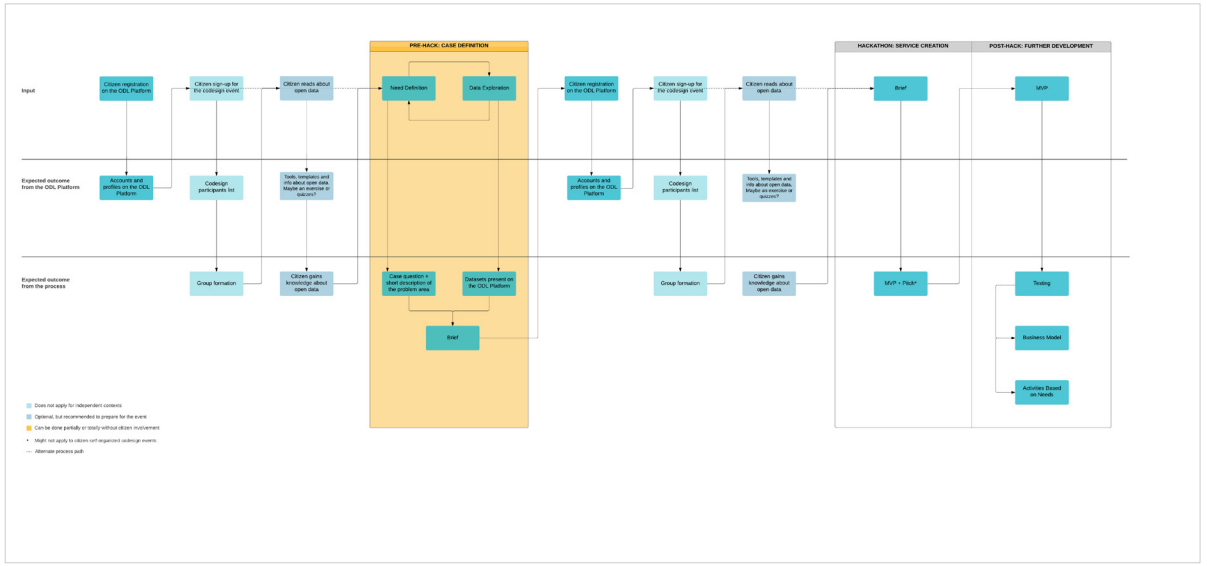
You can see the winner group's github here: https://github.com/na399/OpenTourism and one of the other groups' github with their code repository is here: https://github.com/whatnowapp/whatnowapp.github.io.

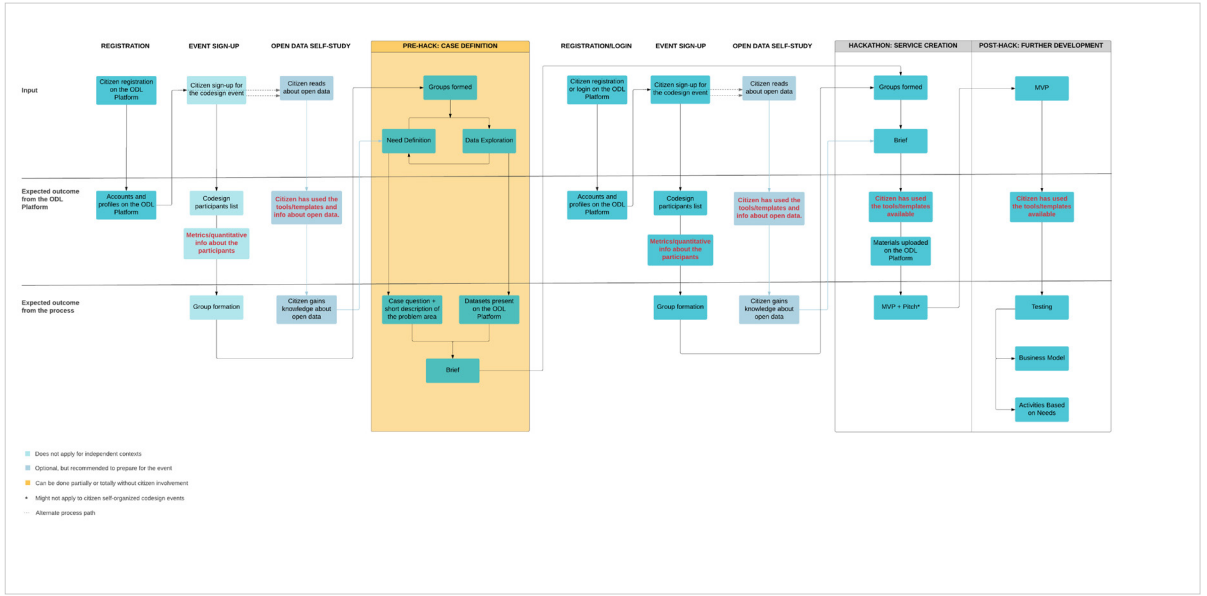
(1b) Frans from Open Data DK as mentioned above.

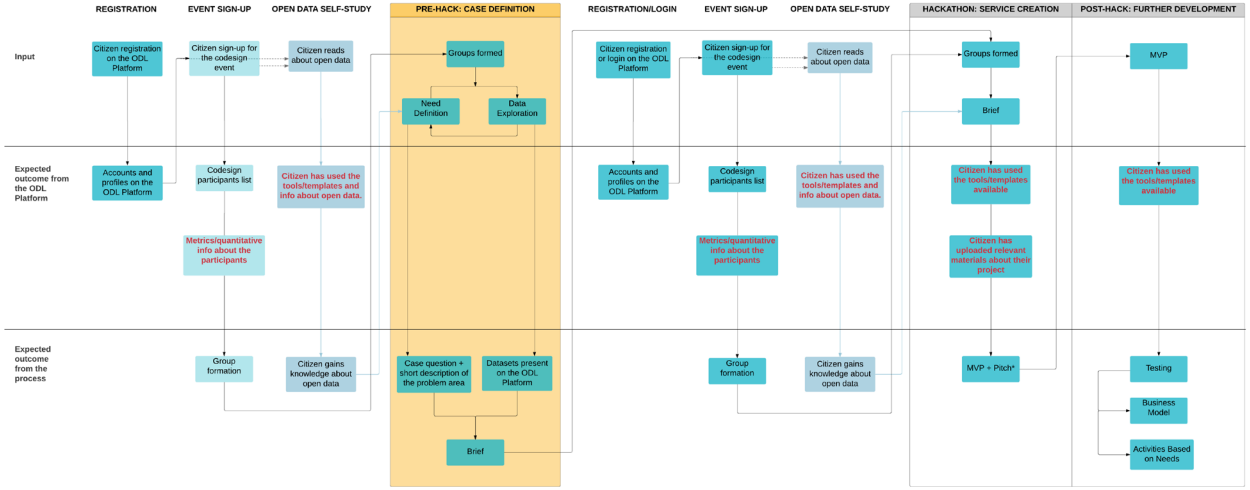
***** http://www.visitdenmark.dk/da/danmark/guidedanmark

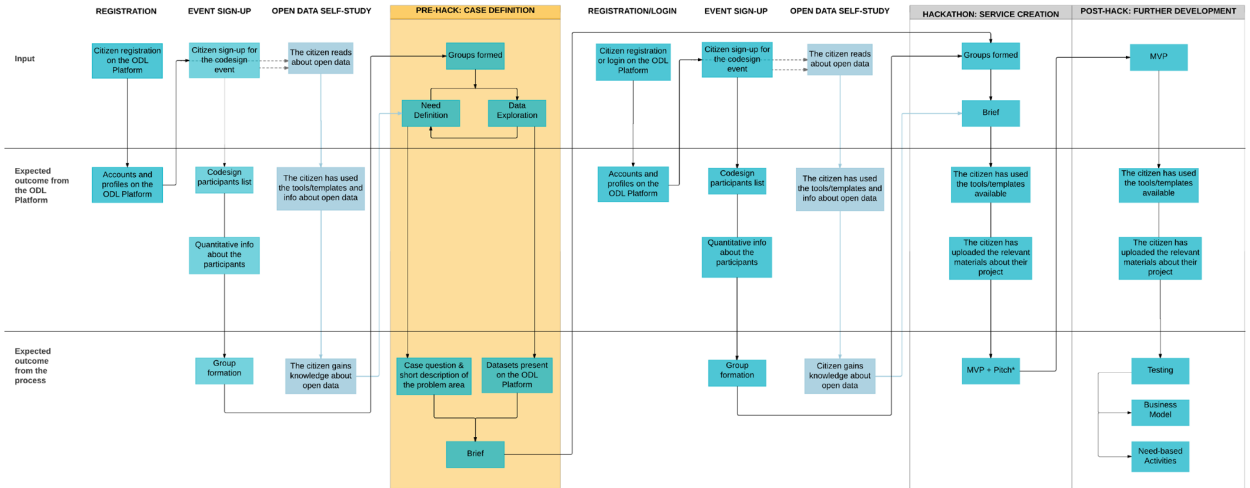
Appendix 4: Evolution of the Proposed Solution

Proposed Process for both contexts






REGISTRATION
EVENT SIGN-UP
OPEN DATA SELF-STUDY
PRE-HACK: CASE DEFINITION
REGISTRATION/LOGIN
EVENT SIGN-UP
OPEN DATA SELF-STUDY
HACKATHON: SERVICE CREATION
POST-HACK: FURTHER DEVELOPMENT
Input
Expected outcome from the ODL Platform
Expected outcome from the process
Citizen registration on the ODL Platform
Citizen sign-up for the codesign event
Citizen reads about open data
Groups formed
Need Definition
Data Exploration
Citizen registration or login on the ODL Platform
Citizen sign-up for the codesign event
Citizen reads about open data
Groups formed
Brief
MVP
Accounts and profiles on the ODL Platform
Codesign participants list
Citizen has used the tools/templates and info about open data.
Metrics/quantitative info about the participants
Accounts and profiles on the ODL Platform
Codesign participants list
Citizen has used the tools/templates and info about open data.
Metrics/quantitative info about the participants
Citizen has used the tools/templates available
Citizen has uploaded relevant materials about their project
Citizen has used the tools/templates available
Group formation
Citizen gains knowledge about open data
Case question + short description of the problem area
Datasets present on the ODL Platform
Brief
Group formation
Citizen gains knowledge about open data
MVP + Pitch*
Testing
Business Model
Activities Based on Needs
Does not apply for independent contexts
Optional, but recommended to prepare for the event
Can be done partially or totally without citizen involvement
Might not apply to citizen self-organized codesign events
Alternate process path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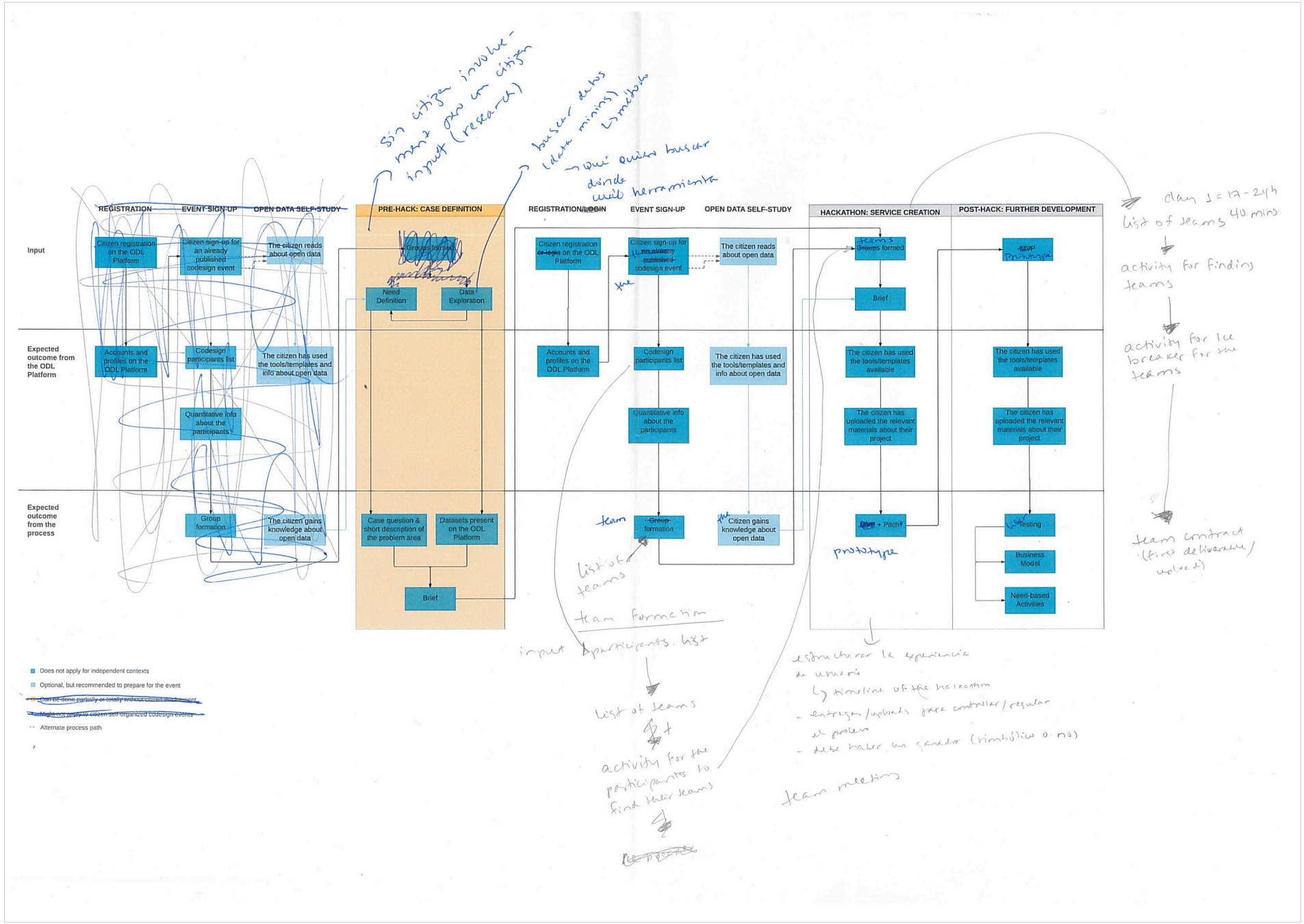
Need-based Activities
Does not apply for independent contexts
Optional, but recommended to prepare for the event
Can be done partially or totally without citizen involvement
Might not apply to citizen self-organized codesign events
Alternate process path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OPEN DATA SELF-STUDY
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Expected outcome from the process
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The citizen has used the tools/templates available
The citizen has uploaded the relevant materials about their project
+ Pitch
prototype
MVP
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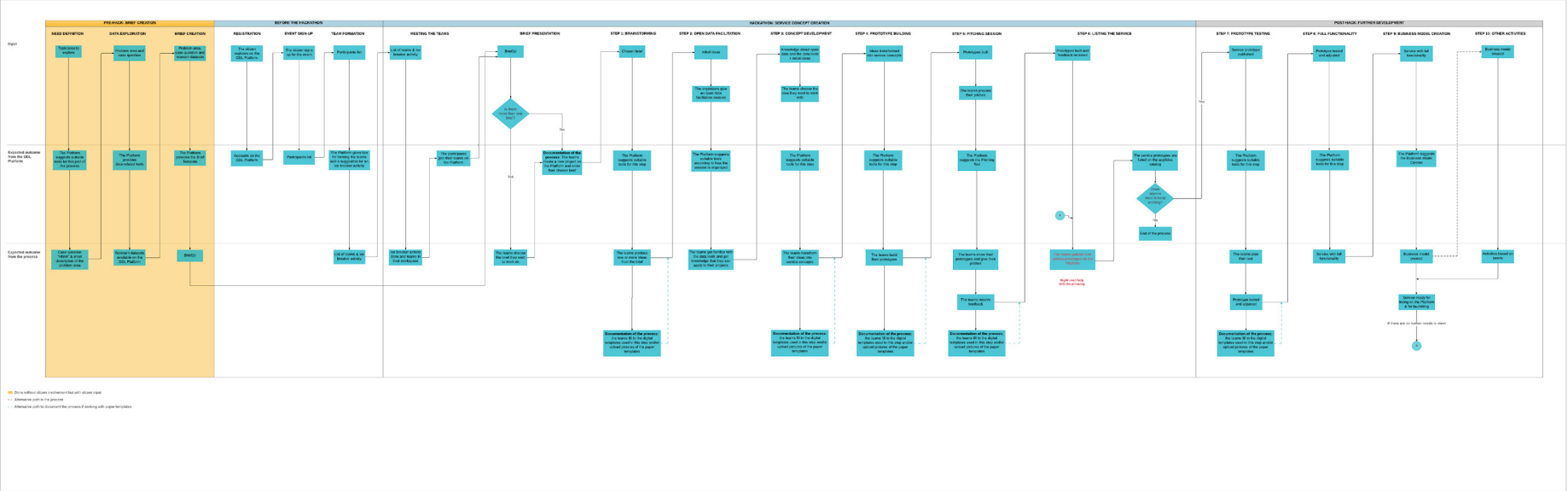
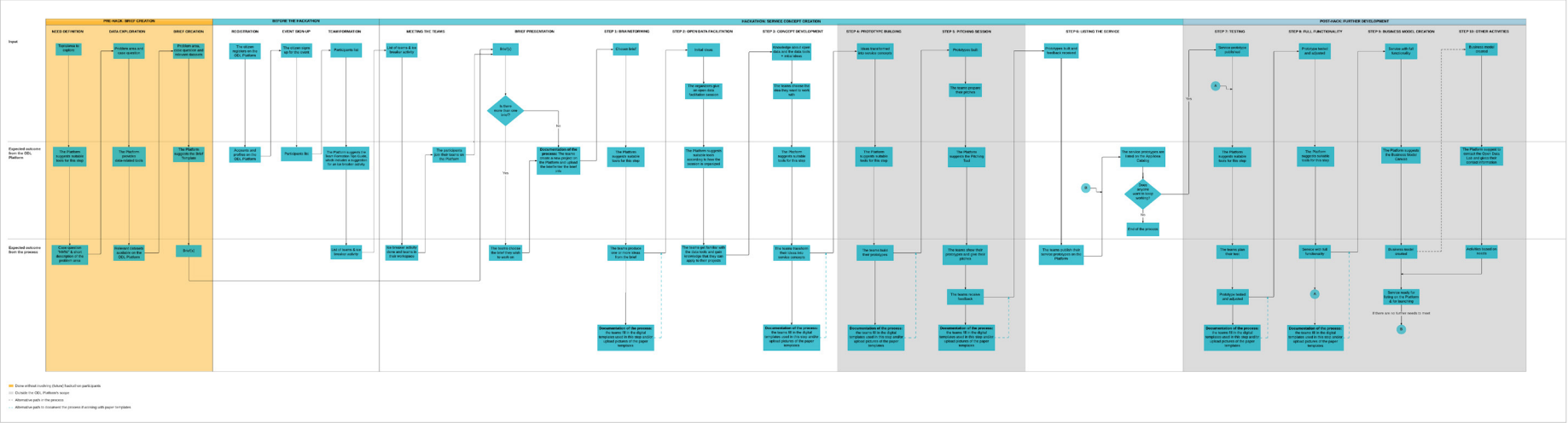
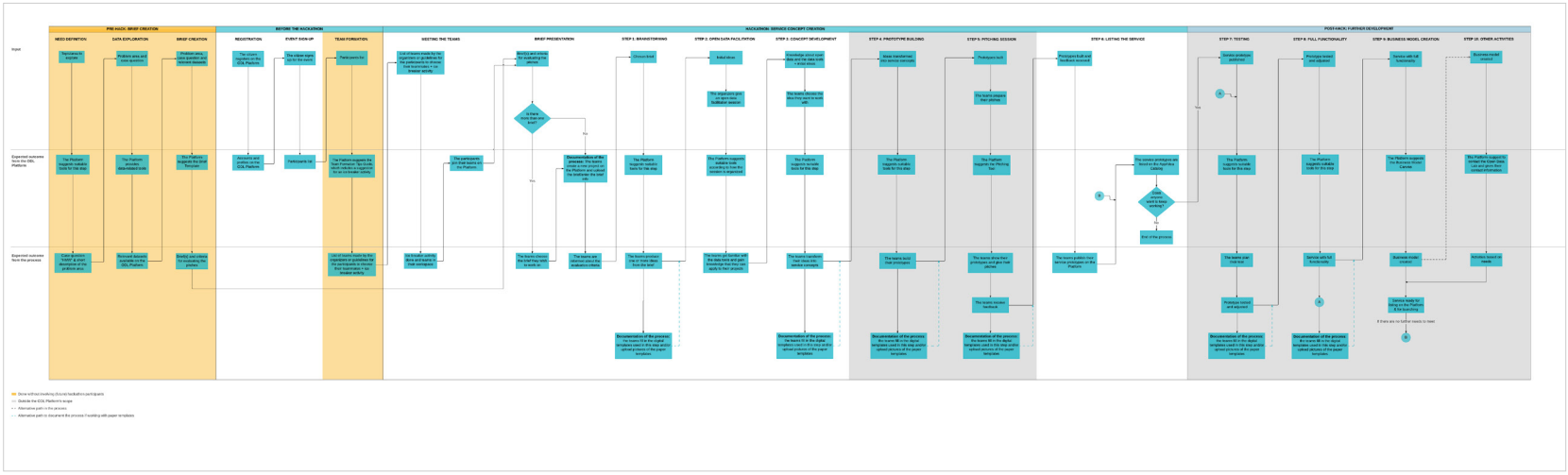
The citizen has uploaded the relevant materials about their project
Testing
Business Model
Need-based Activities
Does not apply for independent contexts
Optional, but recommended to prepare for the event
Can be done partially or totally without citizen involvement
Might not apply to citizen self-organized codesign events
Alternate process path

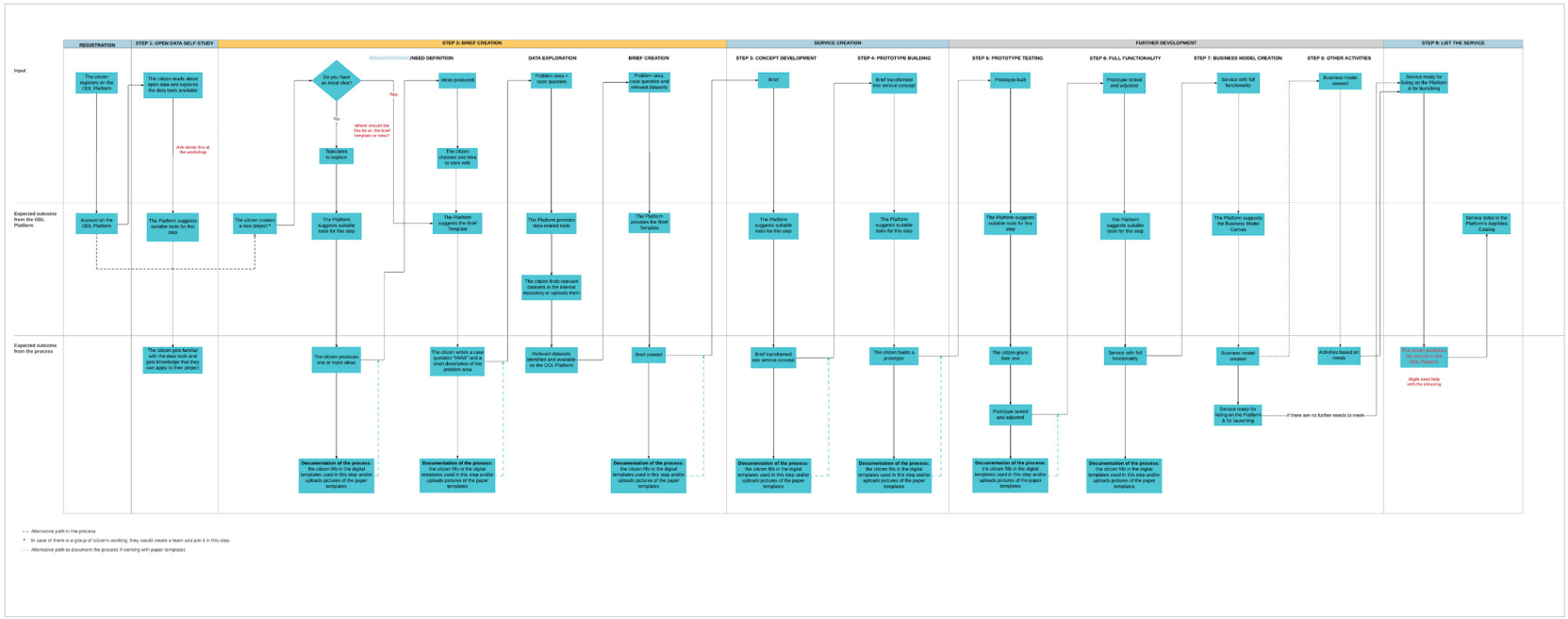
Co-design Context





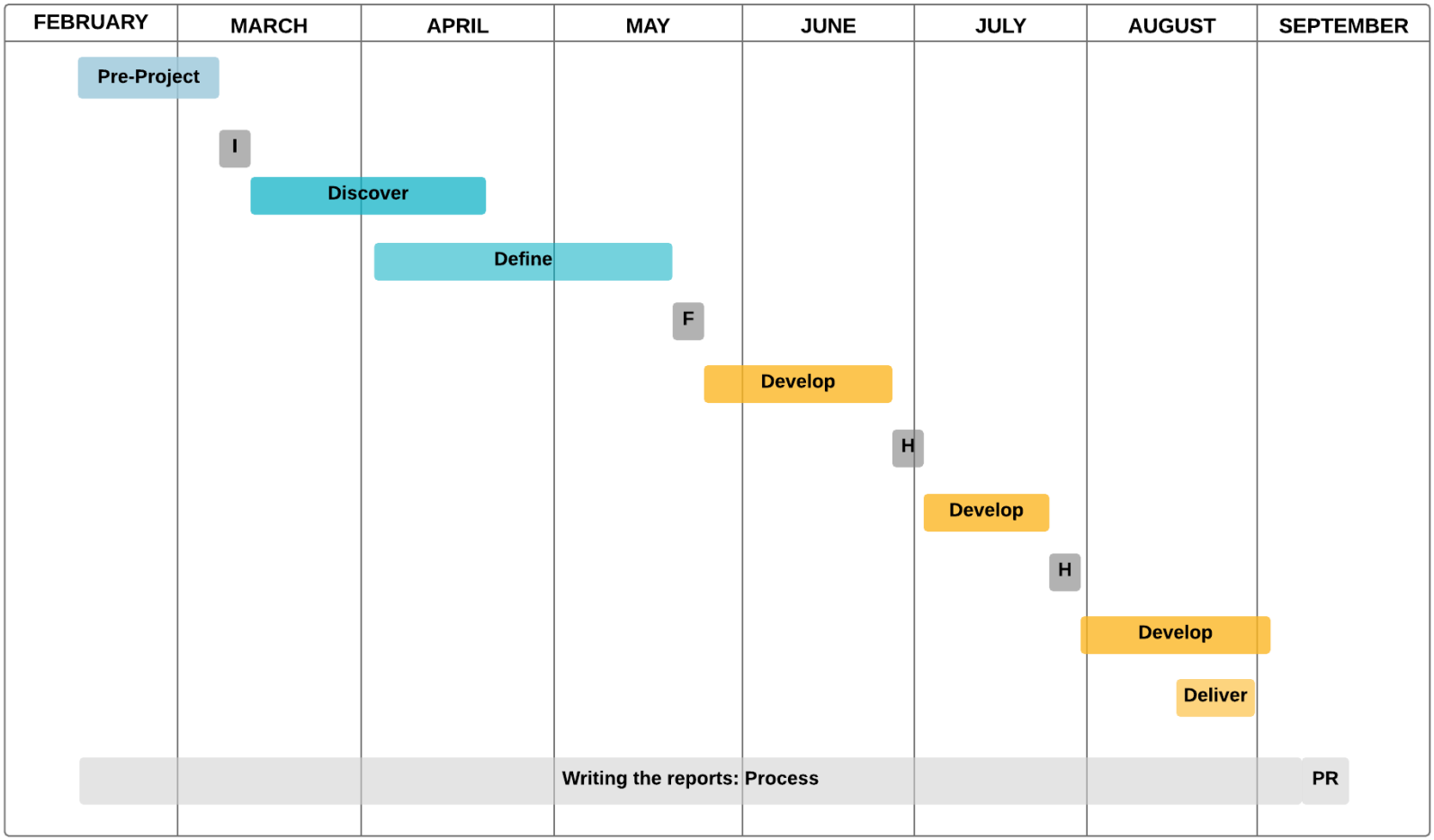


Independent Context



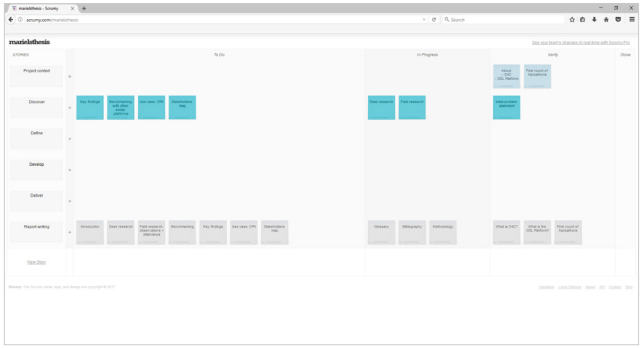
Appendix 5: Thesis Timeline and Project Management with Kanban

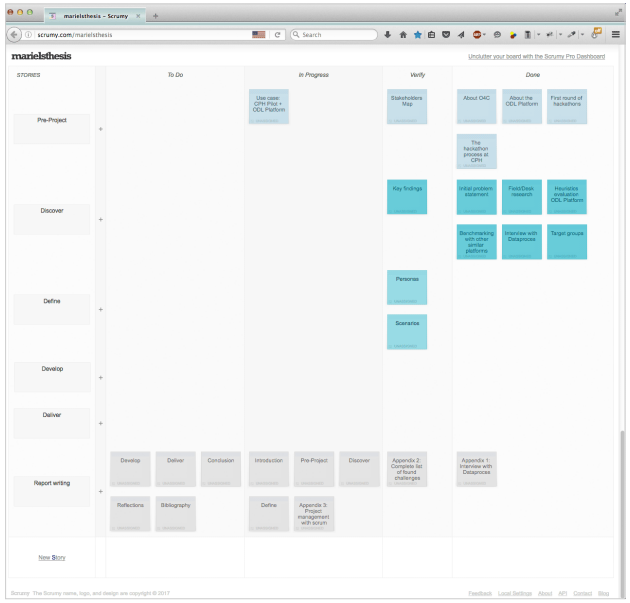
Thesis Timeline

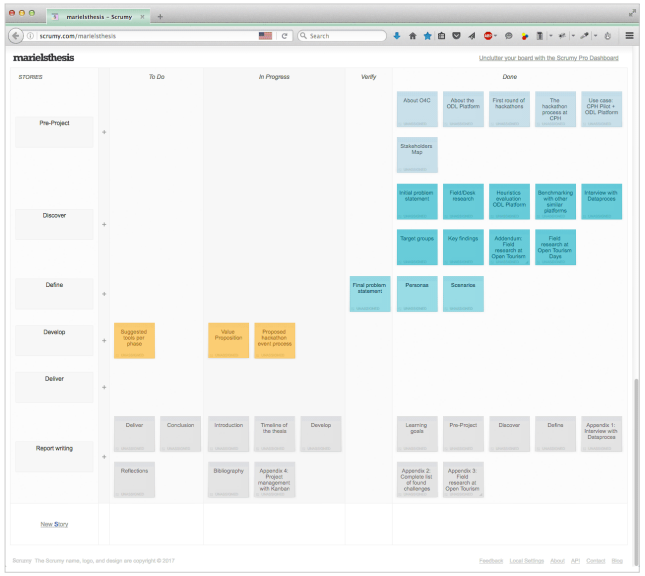


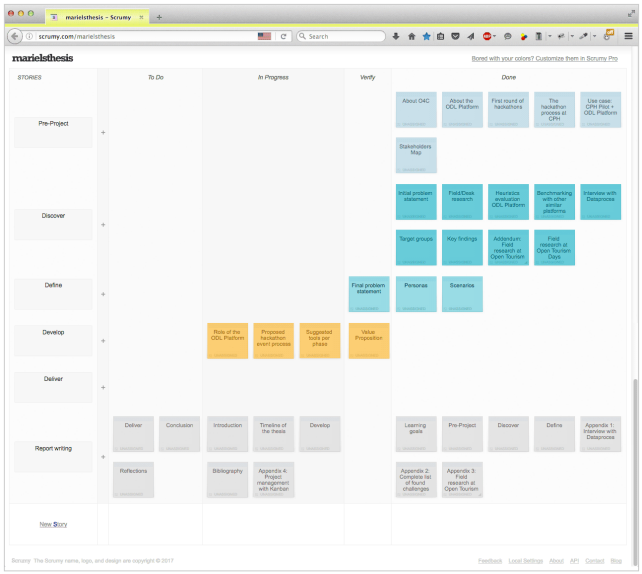
I: Initial Problem Statement
F: Final Problem Statement
H: Summer holiday
PR: Product Report

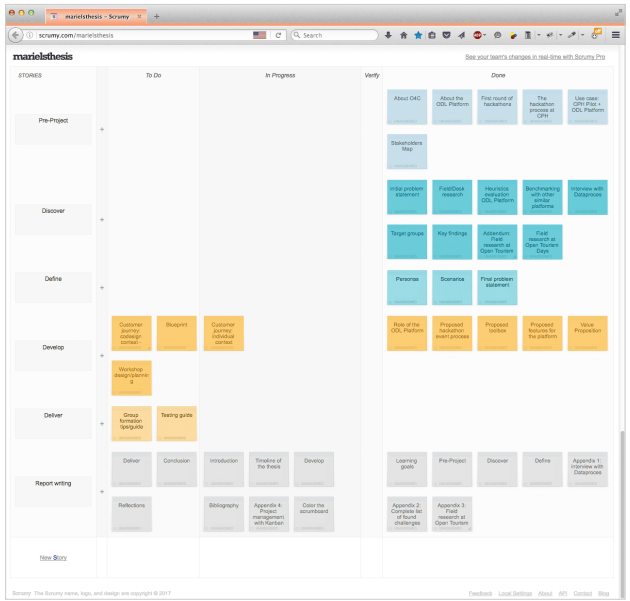
Kanban Chart

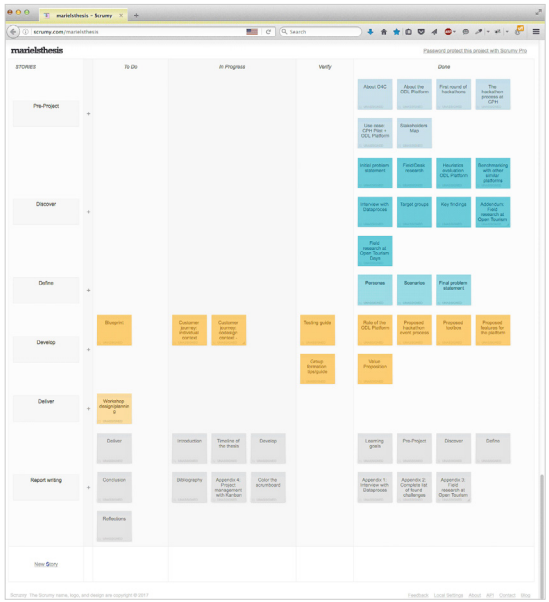


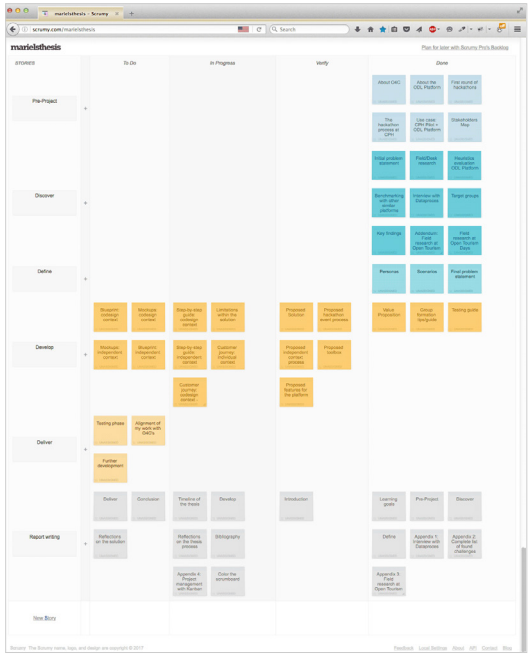


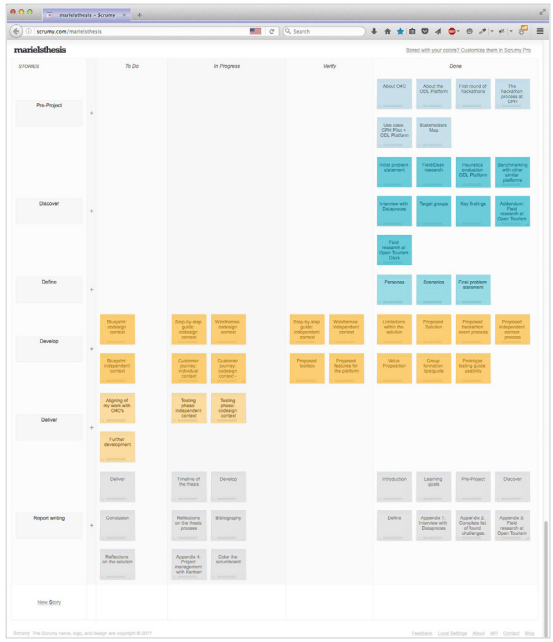


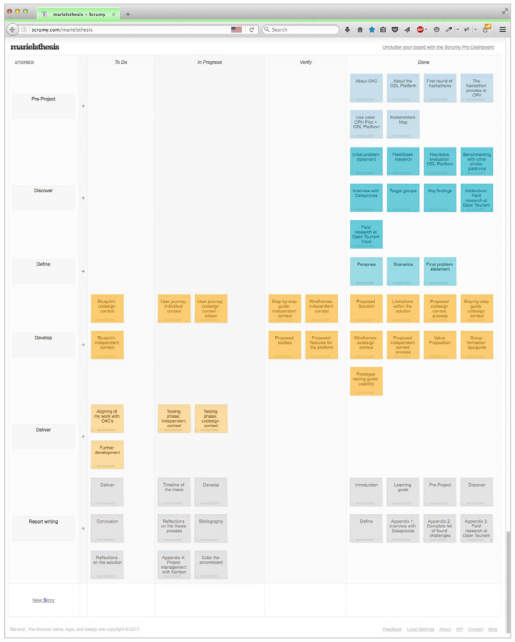


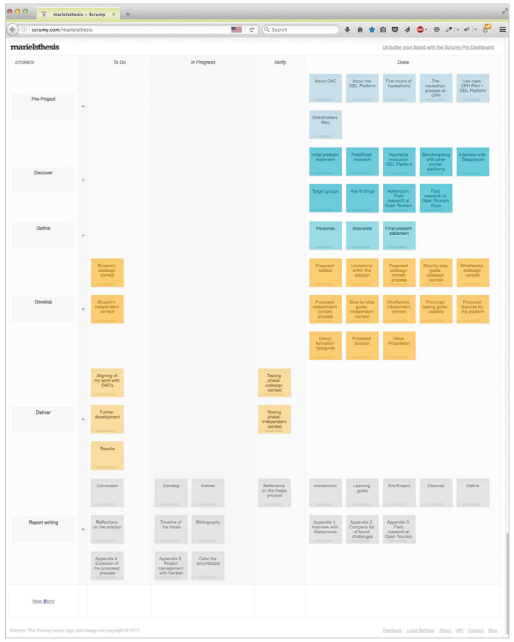


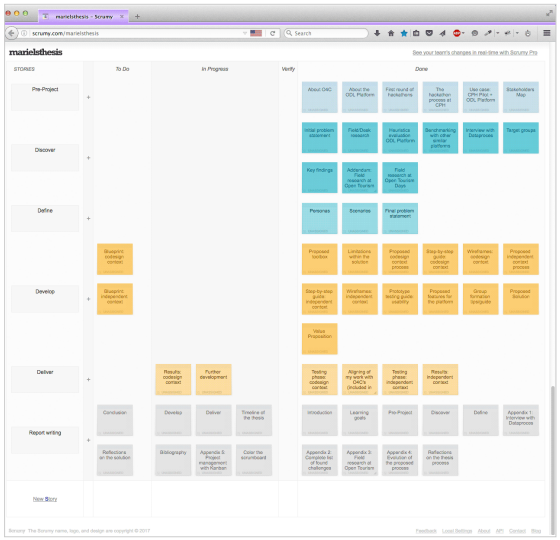


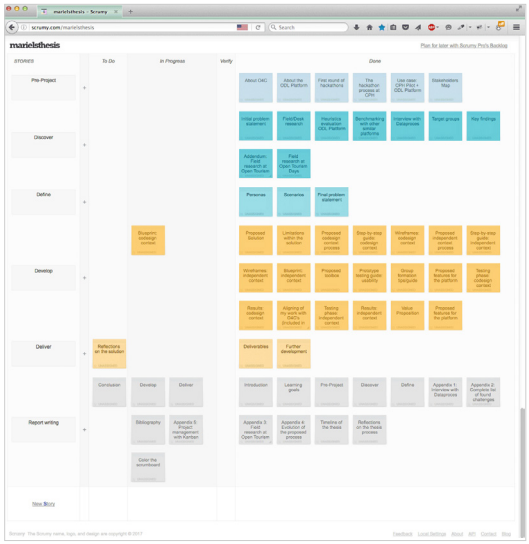


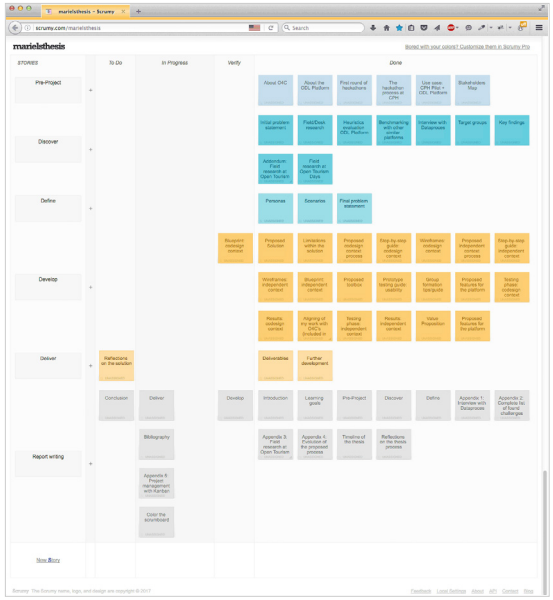


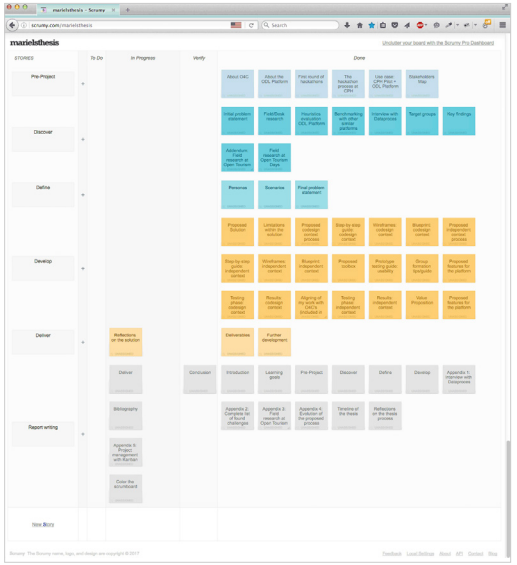


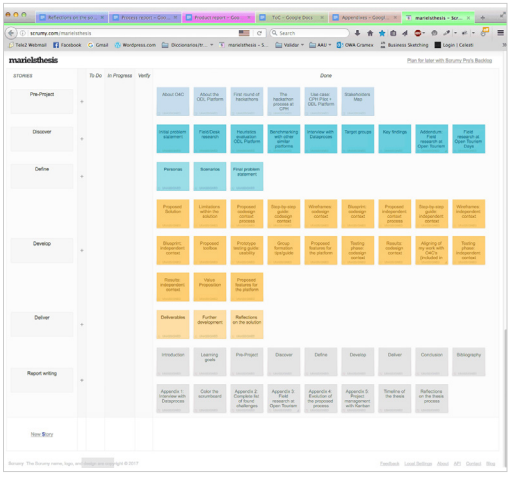










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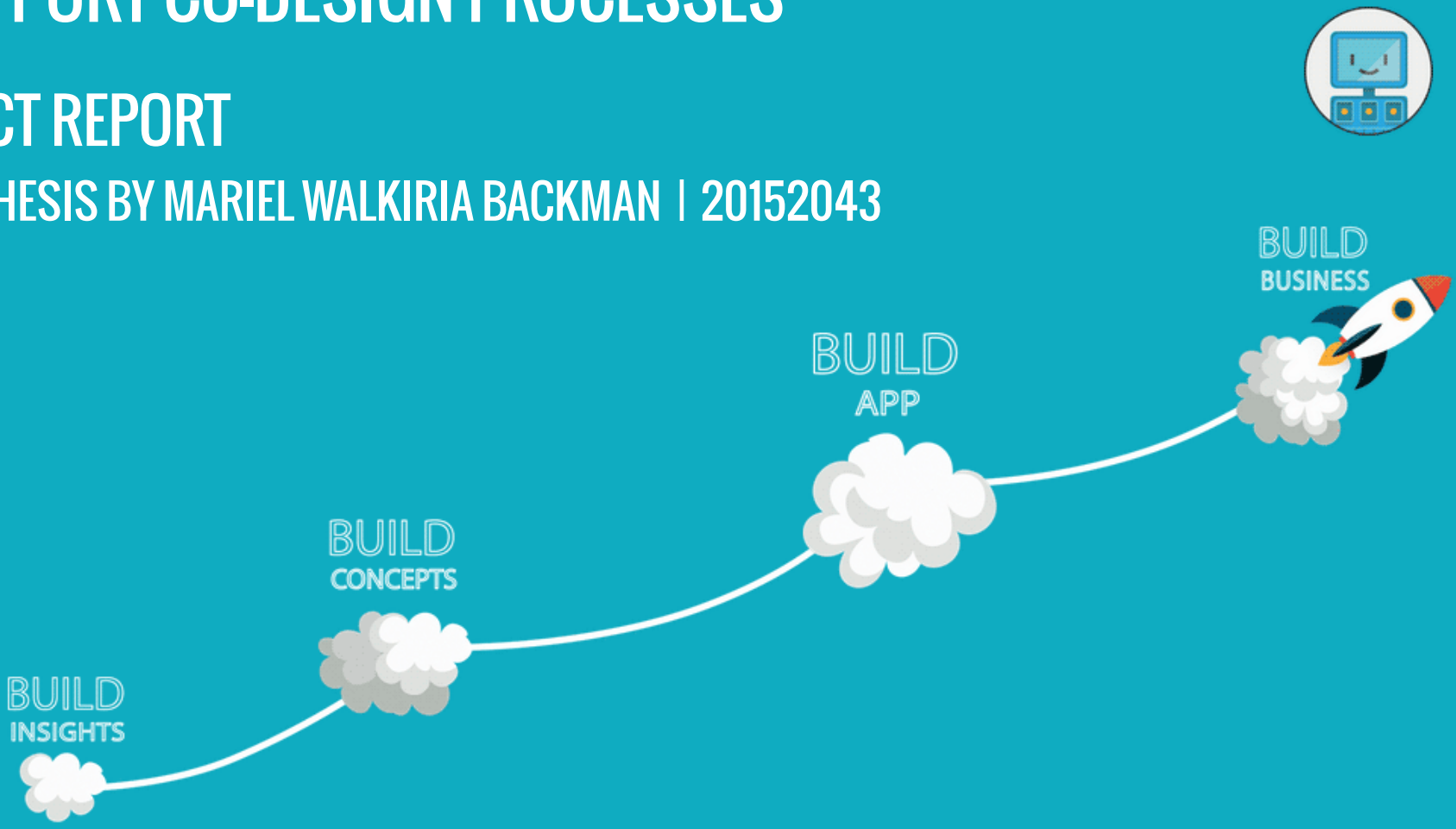
Dataproces®

IT TOOLS FOR CO-DESIGN

DEVELOPMENT OF THE OPEN DATA LAB PLATFORM TO SUPPORT CO-DESIGN PROCESSES

PRODUCT REPORT

MASTER THESIS BY MARIEL WALKIRIA BACKMAN | 20152043



Acknowledgement

Many thanks to

- **Open4Citizens** for their collaboration and feedback in this thesis

  Copenhagen Pilot
  - Janice Pedersen, Antropologerne
  - Amalia de Götzen, Aalborg University
  - Nicola Morelli, Aalborg University
  - Louise Klitgaard Torntoft, Aalborg University
  - Anne Sophie Juul Sørensen, Dataproces
  - Mehdi Ben Taarit, Dataproces

  Rotterdam Pilot
  - Peter Kun, TU Delft

- **My classmates and alumni from the Service Systems Design Master,** for being my sparring partners and for their help and patience whenever I got stuck

- **My friends, family, co-workers at Gramex, and everyone who supported me** in any and every way in this process. You know who you are - *ingen nämnd och ingen glömd!*

Glossary

Co-design: an activity where different kinds of people, such as researchers, designers, coders, public authorities, citizens, and users, who are “experts of their experiences”, come together to cooperate creatively (Steen, Manschot, & De Koning, 2011).

In the context of this thesis, co-design processes will refer to events such as hackathons, design jams, workshops and/or other kinds of events where people build interdisciplinary groups to work on an idea or a challenge. However, the word “hackathon” is the one most frequently used in this thesis.

Data: a value assigned to a thing, that when interpreted creates information (Open4Citizens, 2016a).

Open data: The Open Data Institute defines open data as data that anyone can access, use and share (Open Data Institute, 2017). In addition, the Open Data Handbook states that open data is data that can be freely used, reused and redistributed by anyone, available in a convenient and editable format, preferably by downloading it over the internet (Open Data Handbook, 2017).

Service: something that helps a user or customer to do something (Downe, 2016).

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Introduction

Introduction

Data is an important component in many services and applications today. When interacting with these services and applications, we generate data, which is then transformed. For example, the information we share on our preferred social media could be used for targeted ads; an online shop makes suggestions based on goods we have previously purchased; a fitness app uses the data from previously tracked runs to show us how we have improved over time; a music service recommends new artists and tracks similar to what we have listened to before. Websites collect information about our preferences, where we click, how long we read, etc. - in order to customize their content and offer us a personalized experience.

Within the universe of data, one kind is of particular interest in many countries (Open Knowledge Foundation, n.d.b): open data. Most of us have, at some point in our lives, used a service based on open data. One example is the travel planner we access when we need to know the location and timetable of the bus or the train closest to our place of residence or work. Open data, which is data that can be freely used, reused and redistributed, is here to stay. The Open Knowledge Foundation (OKFN) states that open data "is a tremendous resource that is yet to be untapped", with many areas where it can be of value not only for governments but also for citizens (Open Knowledge Foundation, 2017).

For the public sector it creates transparency, as citizens could easily access available datasets and gain knowledge of what the government is doing and therefore be able to take better informed decisions. For citizens it could be the raw material for the creation of innovative services that can make their lives easier (Carrara & Tinholt, 2016).

A fairly new take on the classic train timetable application was implemented by a software developer at a bar close to Linköping Station in Sweden. The application, which uses open data produced by the Swedish Transport Administration, shows in a big screen not only the train departure information (time, platform and possible delays and/or cancellations, if any), but also if it is time to board the train or if there is time to enjoy a small or large beer (Alvin, 2016).

A citizen's problem with incontinence and with not being able to find a list of public toilets while in the city led her to create the FindToilet[1] app, which uses open data to show on a map where the closest public toilets are.

Her project also opens up for municipalities to upload their own dataset on location of facilities, so her app showcases the most up-to-date information.

These are examples of how citizens with an idea or a need to be met can take advantage of all the possibilities that open data brings, while acquiring new knowledge and skills. However, to get from the initial idea to the identification of the needed information, the creation of the dataset and eventually to the creation of a service there is a know-how gap that needs to be reduced. This is something that the European project Open4Citizens is keen to address, by providing tools that will enable citizens to learn about and unlock the potential of open data and use it to create open data-based services that fit their needs. One of these tools is their digital platform Open Data Lab Platform, which was specifically created "to help its users build an understanding of what open data is" (Open4Citizens, 2016a).

The aim of this project is to investigate how service design can be applied to the development of the Open Data Lab Platform, so that it can be used in both co-design contexts and for independent purposes outside of the framework of a co-design event.

1 http://www.findtoilet.dk/

Pre-Project: Project Context

What is Open4Citizens?

Open4Citizens (O4C) is a 30-month European-funded project that aims to empower citizens to make meaningful use of open data[2] and to reduce the gap between the opportunities that open data present and the citizens' capability to make meaningful use of it. It involves citizens into a co-design process, hereby referred to as hackathons, for the duration of the project, together with experts from various areas: IT, public authorities, startups, designers, etc. to develop new services to improve aspects within their everyday life.

The project is composed of 5 pilots (Fig. 1), who for the hackathons that took place in 2016 have chosen to address needs they have identified locally within this overall theme (Open4Citizens, 2016b):

- **Milan (MIL):** transparency during urban renovation processes
- **Copenhagen (CPH):** integration
- **Rotterdam (RTM):** urban services for public parks
- **Barcelona (BCN):** urban public health, improvement of neighborhood services and better access to local culture
- **Karlstad (KSD):** health

The O4C consortium is formed by 8 partners throughout the 5 pilots, as shown on Fig. 2.

Each pilot will host 2 rounds of hackathons. The first round of hackathons happened in 2016 and the second round will take place in the fall of 2017. After the project is finished, an Open Data Lab (ODL) will be created physically or virtually, which will become a reference for anyone with an interest to propose innovative open data-based applications or services.

Fig. 1 (left). Icons that represent O4C's 5 pilots.
Fig. 2 (right). The consortium.

2 http://open4citizens.eu/

What is the Open Data Lab Platform?

The Open Data Lab (ODL) Platform (Fig. 3) is one of the tools that form the Hackathon Starter Kit (HSK), which is a collection of 9 tools created specifically for this project.

The HSK is primarily intended to lower the entry barrier for participants in hackathons, thus enabling any citizen to take part. Furthermore, it provides a standardized approach to hackathon activities across the pilots (Open4Citizens, 2016c, p. 6), allowing the different information and results to be compared once every country has hosted their event. That said, it left some flexibility to tailor the tools according to the local needs.

The ODL Platform is a tool that enables any citizen to explore the possibilities of open data and understand its full potential. The platform is conceptualized to be used by tech-savvy citizens and non tech-savvy citizens alike, providing both groups tools and guidance to raise their data literacy, build concepts and start building prototypes of services.

It is the vision of O4C that the Platform will live on after the project is finished, as part of the offerings of the Open Data Lab initiatives.

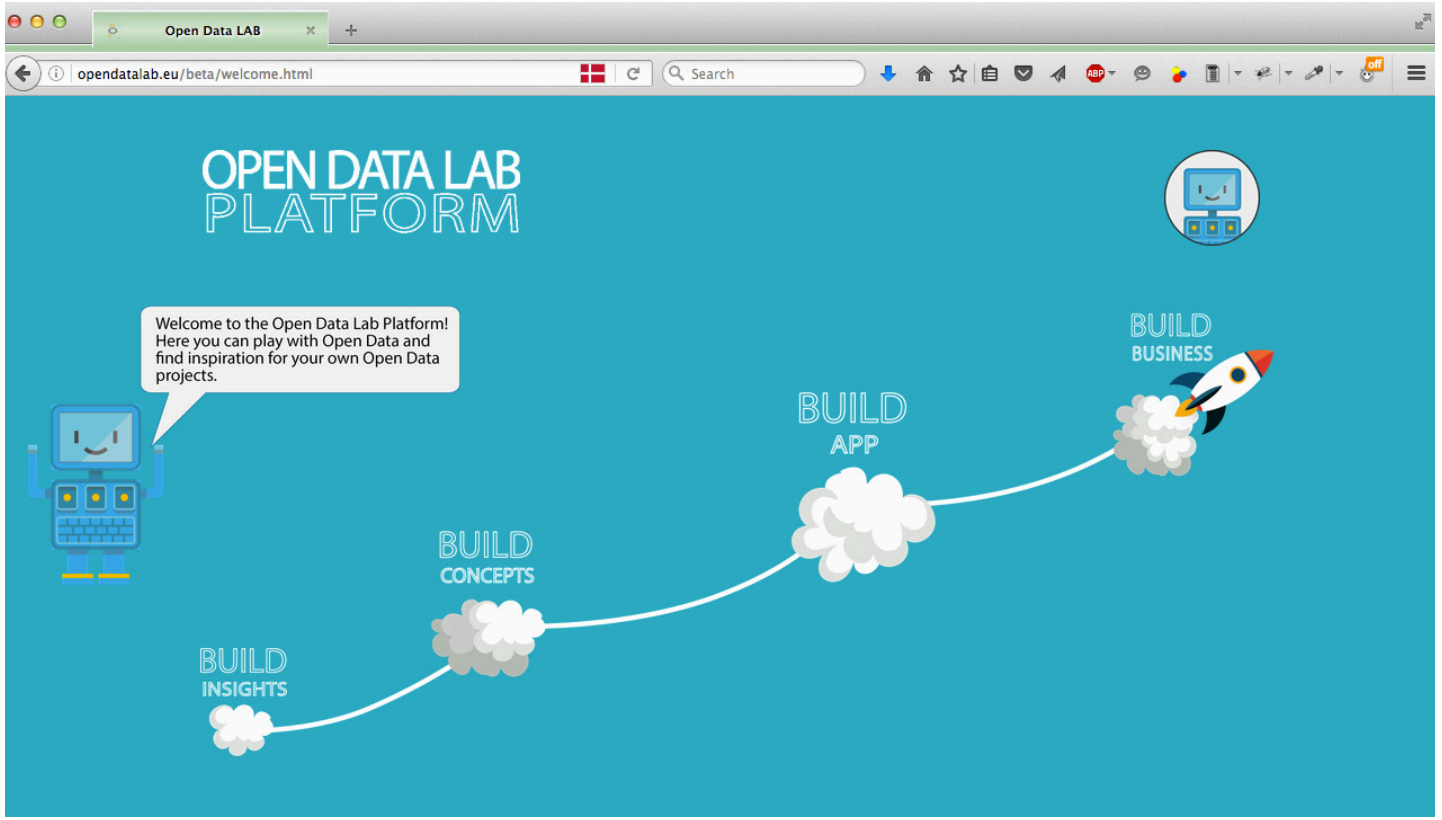


Fig. 3. The ODL Platform as of the writing of this thesis.

Current Characteristics

In its current beta version the ODL Platform is a combination of:

- An introduction to open data
- Inspiration cards with concrete examples of solutions created using open data
- A repository for datasets related to the O4C hackathons
- Data visualization tools
- Several kinds of useful links
- Tutorials for the different tools
- A guide on how to use the Platform itself (Open4Citizens, 2016c, p. 23)

Contexts of Usage

The ODL Platform is conceived to be used in two contexts. One is at an **organized co-design event**, which is the current case in the O4C project. In this context it is sought to form multidisciplinary teams with complementary skills and whose members can look at an issue from the different perspectives their backgrounds give them.

To that end, the Hackathon Organization Handbook (Open4Citizens, 2016d) has been created. It contains guidelines and practical tips on how to run these events, and it is available at the ODL Platform.

The other is an **independent context** and refers to a citizen or a group of citizens who wish to use the platform to create an open data-based solution but without the formalities of a co-design event. However, O4C has not yet defined this context.

Finally, the ODL Platform should work regardless of the idea or topic to be explored, so long as there are open datasets available.

Target Groups

The ODL Platform was designed to be an inclusive tool, in accordance to O4C's general vision. As such, it should be used by "everyone", from which 2 loosely defined target groups have been identified.

The first one is the **facilitators**, which are those in charge of designing and running the co-design events. The second group is labeled as **participants**, and encompasses citizens, public authorities, startups, NGOs, caseworkers, etc. In addition, their proficiency in the use of computer or internet-related technologies (e.g. web or app programming) can range from complete beginners to expert users.

First Round of Hackathons

From internal documents[3] it is understood that each pilot had context-specific factors, such as availability of data relevant to their themes, presence of data owners, the backgrounds of the participants, and the approach they took when they designed their events, among others (Table 1). These, in turn, influenced the outcome they wanted to the get and how the HSK was used.

Despite these differences, one common pattern was observed: **the ODL Platform was underutilized or not used at all**.

3 Hackathon Crew Evaluations and Extended Reports

Factor	BCN	CPH	KSD	MIL	RTM
Found specific datasets (directly) relevant to their theme	✓		✓	✓	
Found generic datasets (directly) relevant to their theme		✓			✓
Data owners brought and presented their data	✓		✓	✓ *	
Used the ODL Platform	✓	✓			
Used open data from the ODL Platform		✓			
Used open data from other sources		✓	✓		
Among the participants there were coders/developers	✓	✓	✓	✓	
Produced prototypes	✓	✓	✓	✓	
Coded apps			✓ **	✓	
Number of emerging solutions	6	6	4	6 app prototypes and 5 mock-ups	0

* There was a stakeholder who presented data, but they were not the data owner.

** Not a finished app or final product.

Table 1.

Case Study: The Copenhagen Pilot

Local Context: Main Insights from the Research Phase

The CPH Pilot was chosen as the case study for this project. The ODL Platform will be examined, with the intention of identifying the possible reasons why it was underutilized on the first hackathon. From these insights a suitable concept will be created.

The Hackathon Process Followed at CPH

The Pre-Hack Phase revolved around a workshop at Verdenskulturcenter, where some initial concepts were created. The intention was to turn them created into defined challenges that could be worked further at the hackathon. However, these concepts could not provide a strong ground for activity, and therefore they were discarded.

From this process, the general topic of “integration” was subdivided into three sub-areas:

- Networks/Networking
- Employment, Competences and Diversity
- Open Investigations, or Stories that beg to be told

The big event in the process was the hackathon Hack Integration. It was a 3-day event where engaged citizens, design students, activities and newcomers, among others, came together, and generated 6 emerging ideas. In addition to the facilitator team from the CPH pilot, the participants had some extra help from data experts from different initiatives.

The Post-Hack Phase consisted of tailored activities based upon merging ideas that were similar or that could work well together, the feasibility of these combined ideas, participant interest and their expressed needs through evaluation and post-hackathon survey.

Stakeholder Map

A stakeholder map is a visual representation of the groups involved in a service and the interplay between them (Stickdorn & Schneider, 2015, pp. 150-153). For the CPH Pilot, the internal and external stakeholders were categorized according to the areas of the hackathon process in which they had interests and made contributions. The center represents the activities that form the hackathon process (Fig. 4).

In addition to the visual representation, Table 2 shows what the stakeholders gave and gained from participating in the different stages of the hackathon process.

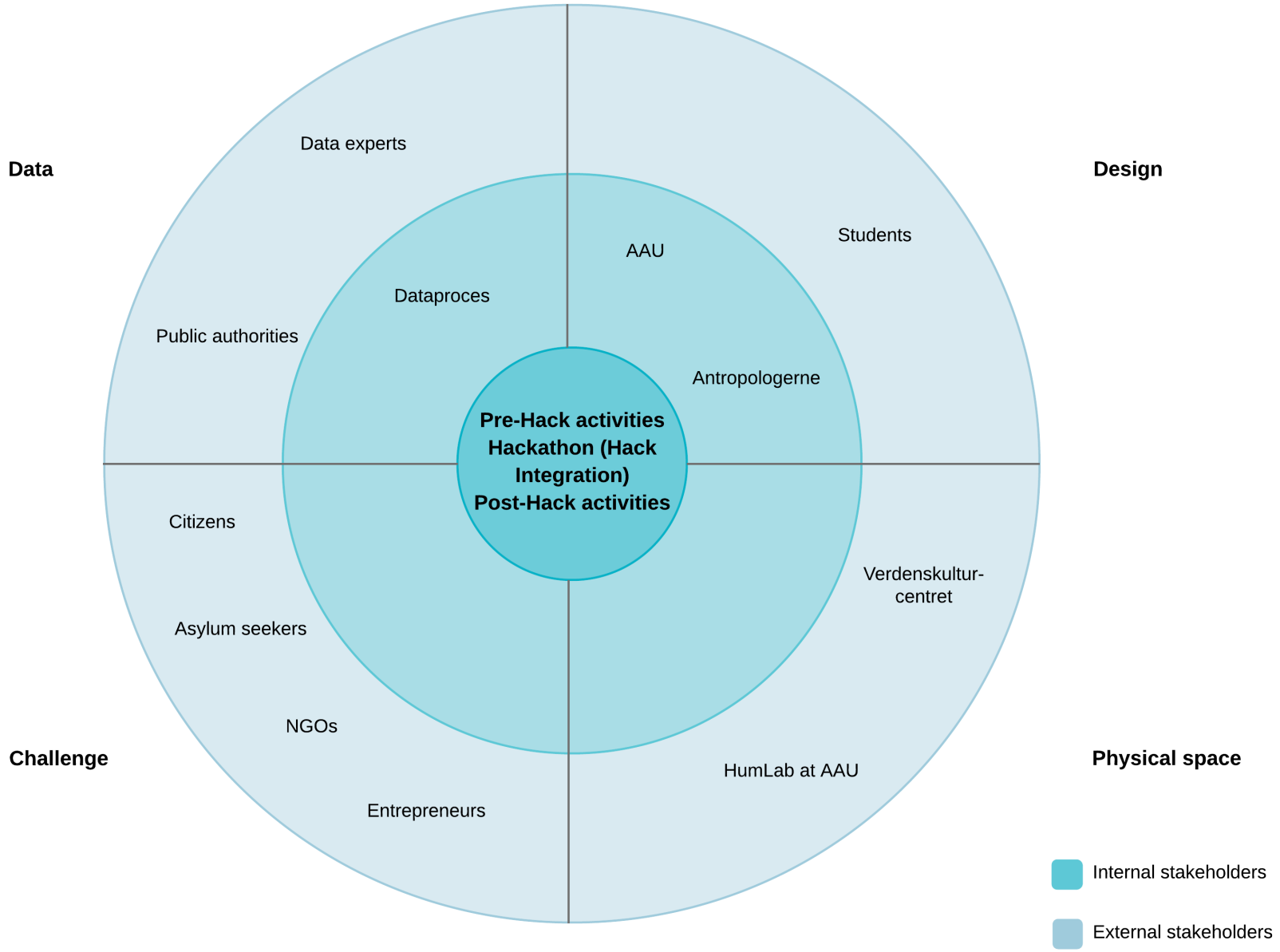

Data
Design
Challenge
Physical space
Data experts
Public authorities
Citizens
Asylum seekers
NGOs
Entrepreneurs
Students
Antropologerne
Verdenskultur-centret
HumLab at AAU
AAU
Dataproces
Pre-Hack activities
Hackathon (Hack Integration)
Post-Hack activities
Internal stakeholders
External stakeholders

Fig. 4.

Stakeholder	Gives	Gains
Internal		
AAU	• Expertise within service design/user centered design • Facilitation of pre-hack, hack and post-hack activities • Access to a broad network of possible relevant stakeholders	• Helping out to create open data-based concepts • Beginning to establish an open data community
Antropologerne	• Applied anthropology and ethnographic methods for user research • Creation of the hackathon toolkit • Access to a broad network of possible relevant stakeholders • Facilitation of pre-hack, hack and post-hack activities	• Feedback to feed into what will be the Citizen Toolkit • Helping out to create open data-based concepts • Beginning to establish an open data community
Dataproces	• Technical know-how in working with open data • Programming the ODL Platform	• Feedback to improve the ODL Platform • Helping out to create open data-based concepts • Beginning to establish an open data community
External		
Public authorities	• Datasets	• Raising citizens awareness about open data • Generating the seeds to implement a new generation of useful open data-based public services

Table 2.

Students	• Skills and knowledge in various areas	• Build a network • Concepts that they can use in their portfolio • Experience in creating solutions in a short period of time • Learn about new tools and practices
Data experts • OpenStreetMap • Mapillary • Open Knowledge Foundation • Sweco/Kortdage conference	• Skills and knowledge in various areas • Inspirational talks • Tools (for ex. Open Street Map)	• Promotion • New business opportunities
Entrepreneurs • Creature • Forening Nydansker • Techfugees DK	• Skills and experience in various areas • Support in post-hack activities	• Promotion
NGOs • Venligboerne • Red Cross - New Times • ASIG	• Skills and knowledge, esp. about integration matters	• Promotion
Asylum seekers	• Firsthand experience in integration matters • Skills in various areas	• Build a network • Be a part of the created solutions • Have a valuable input in in the creation of services/solutions that will fit their needs
Citizens	• Skills and knowledge in various areas	• Build a network • Be a part of the created solutions • Knowledge on open data and active engagement in city solutions.
HumLab and Verdenskulturcenter	• Physical space to host the activities	• Promotion

Similar Existing Platforms

Two platforms that are considerably similar to the ODL Platform were found. They are:

Citadel on the Move (CotM): this is a European Commission funded project where citizens and app developers can create open data-based mobile applications.

Publicdata.eu: is a Pan-European project developed by the Open Knowledge Foundation. It aims to become the single point of access for datasets from public bodies across Europe, in various languages (PublicData.eu, n.d.). At the time of the writing of this thesis, this platform had parts that were no longer operational. Thus, the analysis was made on the parts that do work.

The three platforms were compared using a SWOT Analysis, in terms of internal and external factors that affect them (Stickdorn & Schneider, 2015, p.108) (Fahy, & Jobber, 2012) and their features and their features and characteristics (Table 3).

ODL Platform

Strengths	Weaknesses
• The ODL Platform was created with tech-savvy and non tech-savvy users in mind • It has a clearly defined and gradual learning curve • The website is easy to navigate • No critical issues found on the heuristics evaluation • There are tools for every level of data literacy • It has a guide about how to use the platform itself • It provides a hackathon handbook with tips for organizing codesign events • There is a dataset repository • It is possible to make a request for specific datasets • It has different kinds of app construction tools	• Underutilized in the first round of hackathons • The robot assistance was perceived as unclear • No possibility to export projects from other tools, f.ex. Balsamiq • The layout of text and images needs some tweaking for readibility • Some minor issues in functionality need to be tweaked • Compared to the competitors, the ODL Platform has fewer features to offer • The datasets are listed but not categorized or searchable
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in Denmark according to the Open Data Index (Open Knowledge Foundation, n.d.a) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors who offer more features • Competitors with built-in and free tools

Citadel on the Move

Strengths	Weaknesses
• It has tools for every level of data literacy • Built-in tools to manipulate datasets • Tutorials for the tools, in text and video • Possibility to create a profile and access the created apps and datasets • Search options for datasets available • All the tools in the platform are free • Possibility to create an app in a few minutes with their built-in app generator tool • Possibility to download the code of the app • Installation and programming guide available online and with the downloaded code • FAQ, forums and "Ask a Citadel Expert" options if help is needed • It has app and dataset catalogs	• Apps can only be created within 2 themes: events and parking • Not possible to visualize datasets before creating or during the creation of an app • Too many options on the website and no perceived prioritization • There is no clear learning curve • Datasets only about some cities • Not possible to save work in progress
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in the countries represented, according to the Open Data Index (Open Knowledge Foundation, n.d.b) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors who can develop websites with better features and information architecture • Competitors with an easier learning curve • The application generator tool might be perceived as too simple by expert coders

Publicdata.eu

Strengths	Weaknesses
• Developed by a strong organization: Open Knowledge Foundation • Registration and login options • It features app and idea catalogs • It has a dataset repository by categories • The website is organized and has good readability • There is a search option available • Possibility to personalize data browsing by saving links and creating notes on datasets • Offers basic tools for data analysis and visualization • It has a list of open data portals	• Datasets only about Europe • It seems that to use the data tools one must log in to the platform • Not possible to visualize or download the datasets • It is not possible to assess the learning curve the platform has • The platform is not fully operational, with many parts that are closed or archived
Opportunities	**Threats**
• Open data usage is on the rise (Carrara & Tinhold, 2016) • Data maturity in Europe according to the Open Data Index (Open Knowledge Foundation, n.d.b) • The European Commission supports open data initiatives (European Commission, 2016)	• Competitors with fully operational platforms • Competitors who can develop websites with better features • Competitors with an easier learning curve

Feature	ODL Platform	CotM	Publicdata.eu
Data related tools			
Data visualization tools	Yes	Yes (after creating apps)	They claim they have them but it is not possible to access them.
Create own datasets	No	Yes	Unknown
Publish own datasets	No	Yes	Unknown
Test datasets	No	Yes	Unknown
Convert datasets	No	Yes	Unknown
Request datasets	No	Yes	Unknown
Learning Tools			
Tutorials/guides	Yes (text and animations)	Yes (text and videos)	Unknown
Installation/programming guide	No	Yes	Unknown
Other features			
Registration/login/create profile	No	Yes	Yes (not operational)
Dataset repository	Yes (not categorized)	Yes	Yes

Table 3.

App catalog	No	Yes	Yes
App construction tools	Yes (pointing to external resources)	Yes (bulit-in)	Unknown
Download the app code	No	Yes	Unknown
Search options	Yes	Yes	Yes (not operational)
Forum/community board	No	Yes	No
Other			
Suitable to use in a hackathon	Yes	Yes according to https://goo.gl/PZuASC but there is no information about how it was used	Unknown
Gradual learning curve	Yes	No	Unknown

Challenges Using the ODL Platform

The underutilization of the ODL Platform in the hackathon event cannot be attributed to one or 2 single reasons. Through traditional coding of qualitative data (Bjørner, 2015), representing 3 different points of view (observations at the hackathon; feedback from the participant evaluations and the post-hackathon survey; and the hackathon crew evaluation), it was possible to identify issues in 4 areas.

People (skills/factors): refers to the CPH Pilot not being able to find data experts who could help defining the topic early on and to understand the relevance of the available datasets, lack of programmers participating, and expert participants who brought in their own tools or used their own methods.

Facilitation: the use of data was not well guided. Two possible causes were observed and relate to the facilitator team not being familiar with the Platform, and that the available data experts were not successful in helping the groups.

Process: refers to how the hackathon event process was detached from the data part of it (the introduction to open data and to the Platform), which includes the Platform; the participants felt that there were too many tools, that the data tools were introduced late and that it was challenging for them to have data as a core element in their concepts.

Data: lack of available specific open datasets on immigration and migrants.

From an interview with Dataproces it was learned that the Platform was not included in the hackathon process, in that the consortium was not clear about which features the Platform should have, except for the data visualization tools; and that the event focused on coming up with new ideas and there was no time to use the Platform and to learn about data.

Problem Statement

The ODL Platform has been created to be used in contexts of co-design events, as well as independent contexts. Therefore, it should provide suitable tools that can support and be used accordingly in both contexts while achieving the purpose for which it was created.

To that end, the problem statement that will steer the development of the solution will be:

How might we create a digital Platform that can support both co-design event processes and individual creativity processes in the open data context?

The Solution

The Proposed Solution

The proposed solution has been built around restructuring the hackathon event process, by giving the Pre-Hack, Hackathon and Post-Hack phases dedicated inputs and expected outcomes from the process itself and from the ODL Platform. A similar process for the independent context will be created.

In such process the ODL Platform is given an active role: to be a **facilitation tool** that provides citizens with **step-by-step guidance** in learning about open data and in transforming an initial idea into an open data-based service. The solution also looks into equipping the Platform with relevant tools and templates, in order to achieve the expected outcomes in each phase of the restructured process.

For whom is the solution developed?

The proposed solution has been developed for **citizens with little to no knowledge about open data, regardless of their technical/programming expertise**. This target group has been identified from the original target group “participants”, and has been defined by means of creating a persona called Lise (Fig. 5).

“Personas” is a tool that represents a target group in terms of the different traits they might have, as well as to provide different perspectives about a service. Stickdorn and Schneider state that by using personas it is possible to “define and engage the different interest groups that may exist within their target market” (Stickdorn & Schneider, 2015, pp. 178-179).

After creating the persona, two scenarios were made. Scenarios are hypothetical stories created with the intention of exploring a particular aspect of a service (Stickdorn & Schneider, 2015, pp. 184-185). In this case, they show how Lise could use the ODL Platform and benefit from it. The first one (Fig. 6) illustrates her journey of individual creativity, while in the second one (Fig. 7) she is a participant of a co-design event.

Proposed Process

Lise

"I have ideas for apps but no technical skills to make them happen"

Age: 40
Location: Vanløse
Archetype: "The problem owner"

Tech skills

Beginner **Expert**

Data skills

Beginner **Expert**

Bio

Lise has an administrative position at a small company and on her spare time she volunteers at an NGO that help several causes. Through this volunteering opportunity she has acquired first-hand knowledge on various issues, and she gets ideas for solutions to these issues often.

Lise heard about open data at an event where she helped out with practical tasks. Inspired by the possibilities of open data, she thinks that it could be an important element in the solutions she wants to create.

Motivation

- She has identified a few problem areas she wants to get involved
- Her knowledge and her ability to come up with ideas for solutions to these problem areas
- She wishes to use open data as an important element for her ideas

Frustrations

- Lack of technical skills to make her ideas reality
- Not much knowledge about how to use open data

Fig. 5.

Scenario: Independent Context

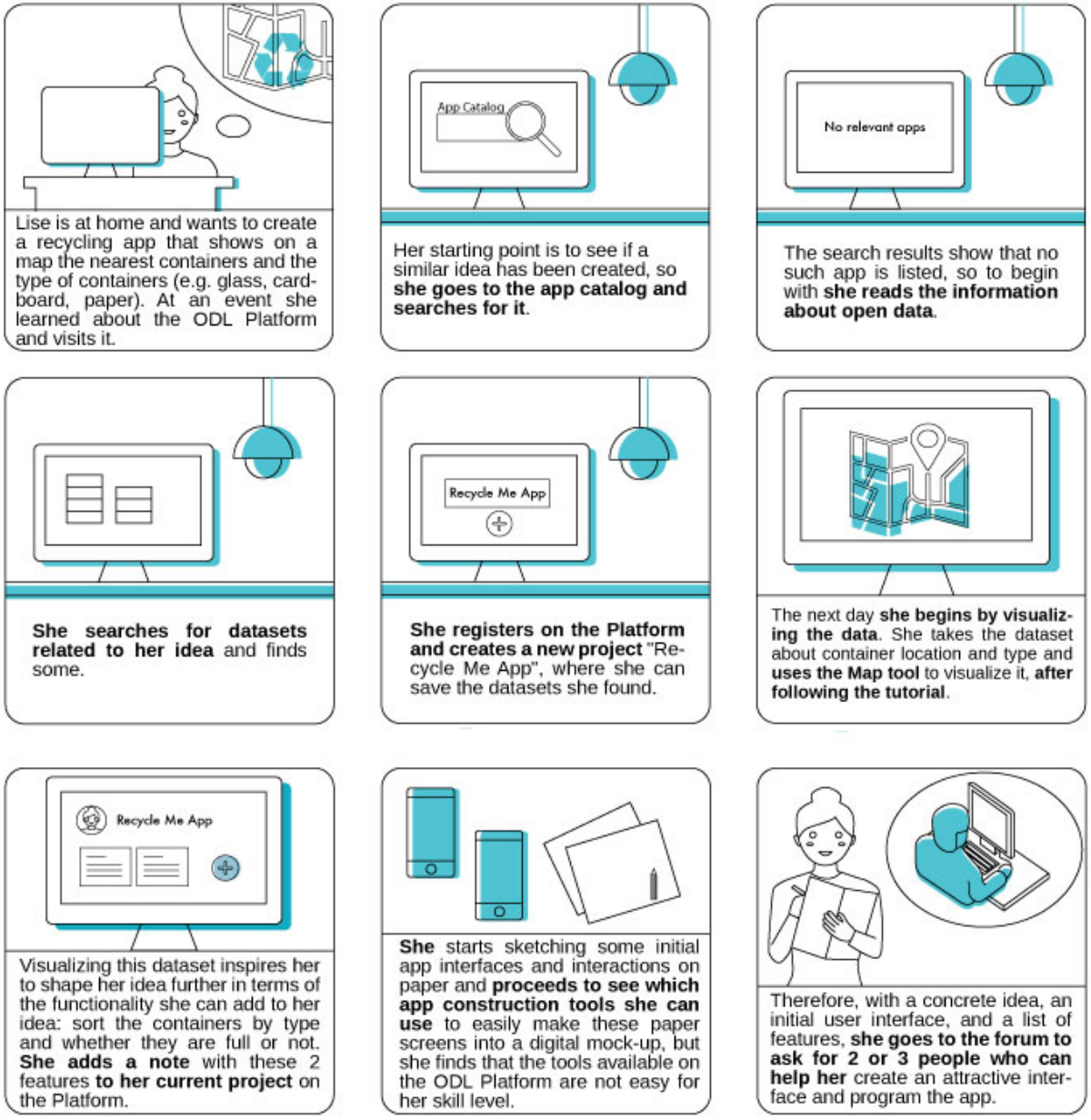


Fig. 6.

Scenario: Co-design Context

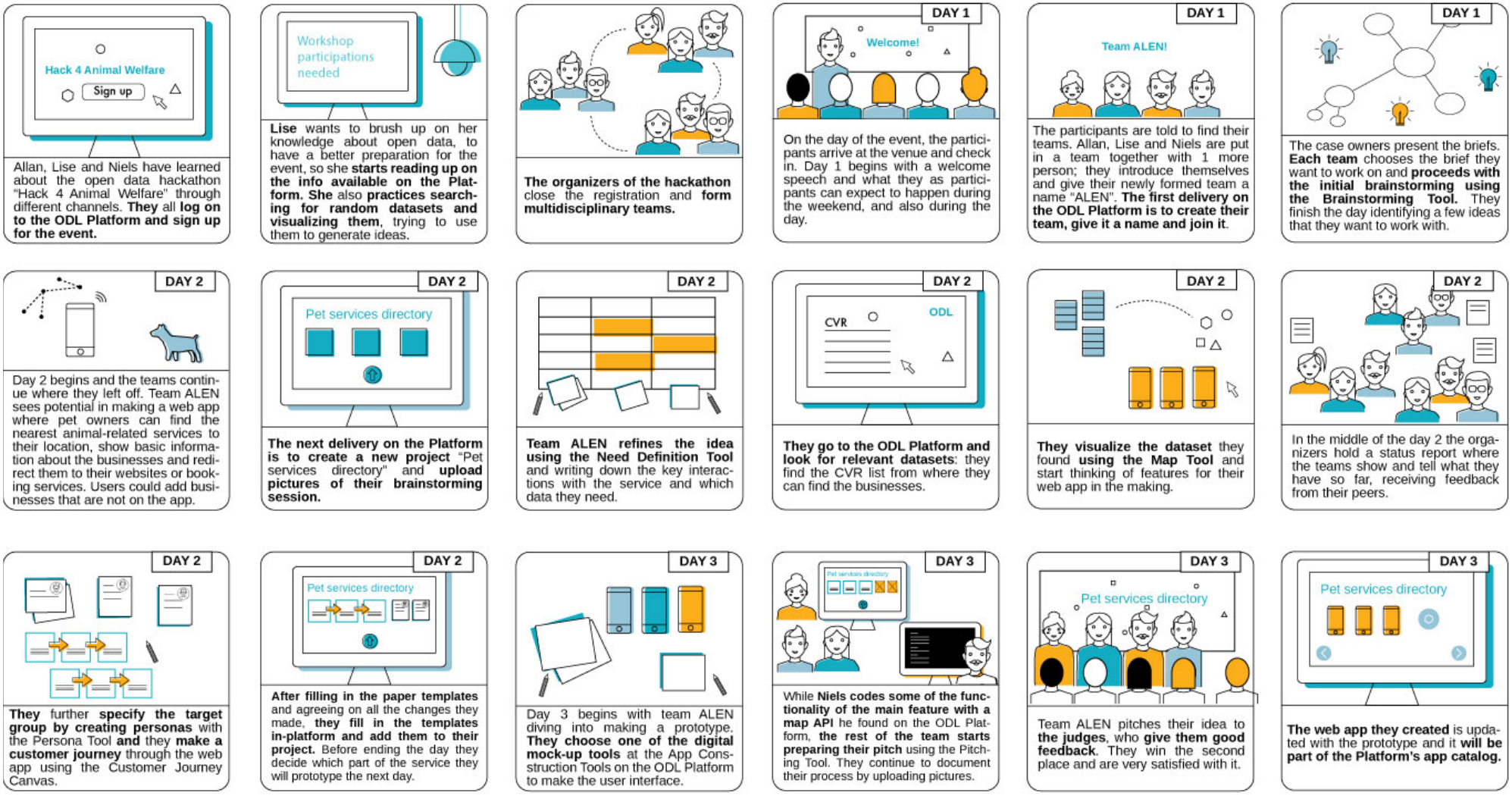


Fig. 7.

Co-design Context

The proposed co-design event process (Fig. 8) has been created as an aid in showing facilitators and organizers the workflow of a co-design event and how the ODL Platform can give them support along the way.

The Pre-Hack Phase is where the stakeholders will shape the theme of the co-design event and create the brief(s) that will be used in the hackathon event. It is here where the criteria for evaluating the ideas will be drafted and the format of the Open Data Facilitation Session will be defined.

The Hackathon Phase is where the co-design event takes place and where the Platform is expected to be utilized the most. One important moment in this phase is the Open Data Facilitation Session, which is where the participants will be introduced to the concepts of open data and the data tools. The ideal scenario is that a data expert facilitates this session and provides some small exercises to get familiar with the tools. That said, it is up to the facilitator team and/or the data expert to decide how the session will be organized.

In the Post-Hack Phase activities can be organized based on the needs of the service concepts and the participants' interest in continuing to work on their service ideas to be developed into services with full functionality. As a minimum, the Platform offers a usability testing guide and how to create a business model using the Business Model Canvas.

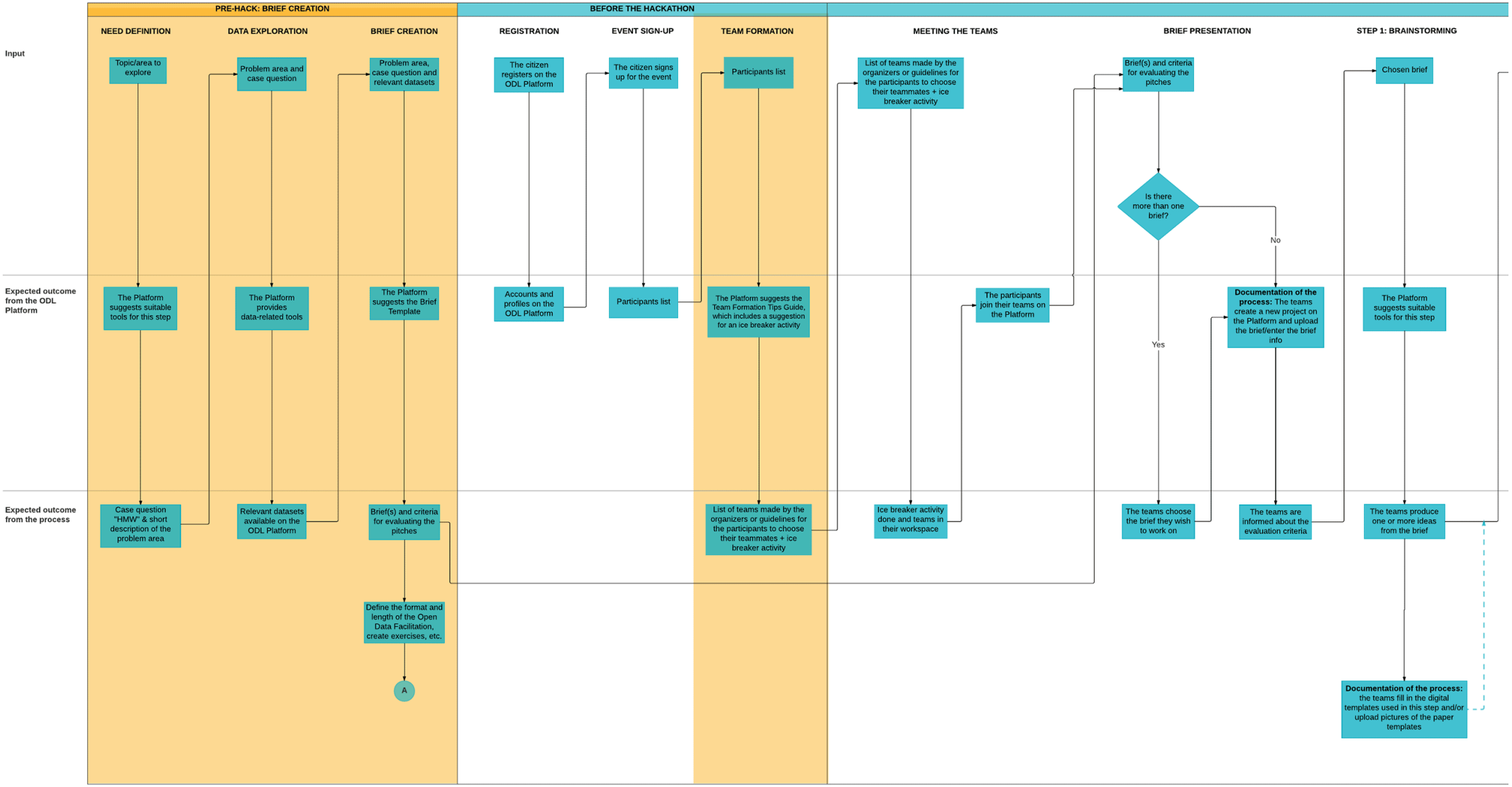
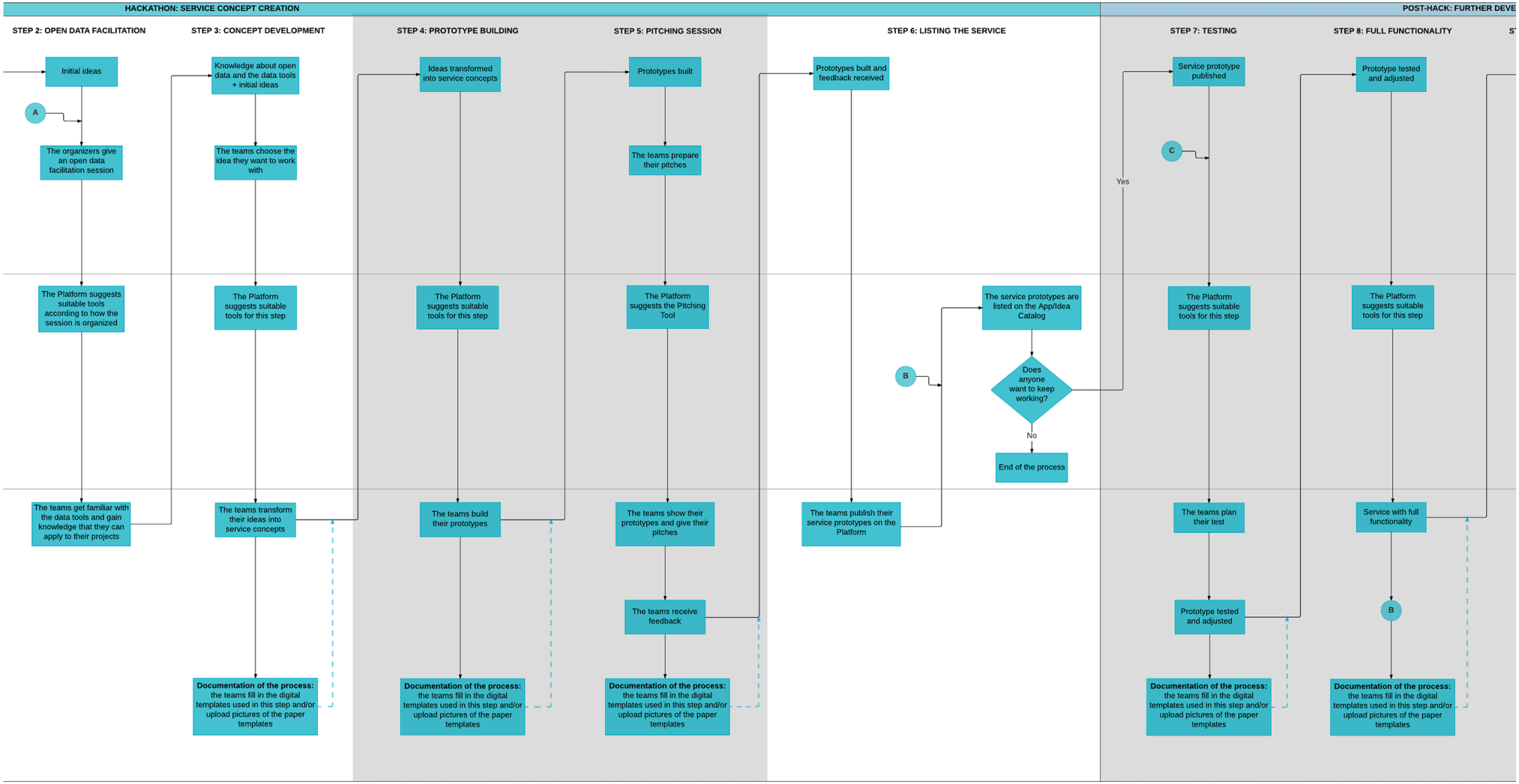

PRE-HACK: BRIEF CREATION
BEFORE THE HACKATHON
NEED DEFINITION
DATA EXPLORATION
BRIEF CREATION
REGISTRATION
EVENT SIGN-UP
TEAM FORMATION
MEETING THE TEAMS
BRIEF PRESENTATION
STEP 1: BRAINSTORMING
Input
Expected outcome from the ODL Platform
Expected outcome from the process
Topic/area to explore
Problem area and case question
Problem area, case question and relevant datasets
The citizen registers on the ODL Platform
The citizen signs up for the event
Participants list
List of teams made by the organizers or guidelines for the participants to choose their teammates + ice breaker activity
Brief(s) and criteria for evaluating the pitches
Chosen brief
Is there more than one brief?
No
Yes
The Platform suggests suitable tools for this step
The Platform provides data-related tools
The Platform suggests the Brief Template
Accounts and profiles on the ODL Platform
Participants list
The Platform suggests the Team Formation Tips Guide, which includes a suggestion for an ice breaker activity
The participants join their teams on the Platform
Documentation of the process: The teams create a new project on the Platform and upload the brief/enter the brief info
The Platform suggests suitable tools for this step
Case question "HMW" & short description of the problem area
Relevant datasets available on the ODL Platform
Brief(s) and criteria for evaluating the pitches
List of teams made by the organizers or guidelines for the participants to choose their teammates + ice breaker activity
Ice breaker activity done and teams in their workspace
The teams choose the brief they wish to work on
The teams are informed about the evaluation criteria
The teams produce one or more ideas from the brief
Define the format and length of the Open Data Facilitation, create exercises, etc.
A
Documentation of the process: the teams fill in the digital templates used in this step and/or upload pictures of the paper templates
Done without involving (future) hackathon participants
Outside the ODL Platform's scope
Alternative path in the process
Alternative path to document the process if working with paper templates

Fig. 8.

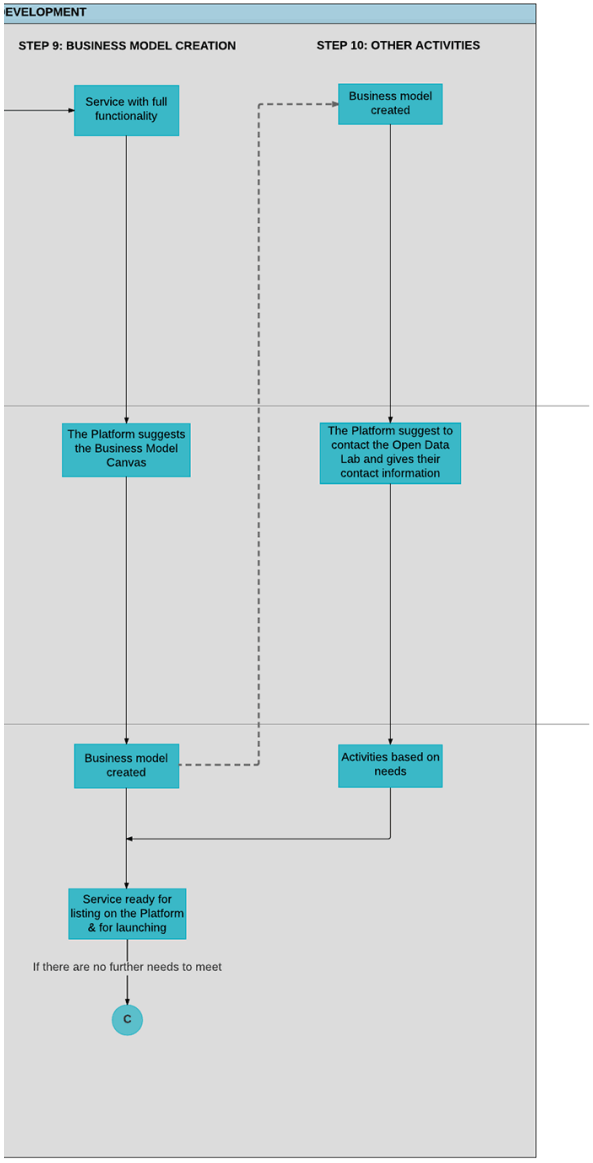


Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates



Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates

Step-by-Step Guide

The step-by-step guide is the way in which the proposed process will be visualized to the citizen. In this context it is also intended to serve as an aid to the facilitators and organizer team. This guide is designed to have 10 relevant steps for the citizen, which correspond to the steps shown in the proposed process. With each step the guide will provide the necessary tools to accomplish the expected outcomes and point to where they are located on the ODL Platform (Table 4).

The guide provides a flexible structure with respect of the tools, in that the facilitators could choose to leave out tools that do not fit the format of the co-design event they organize. Likewise, the participants can decide whether they wish to use all the tools or skip those that they consider not relevant for their solution.

To read more about the tools, please refer to the section “Proposed Toolbox”.

Fig. 6 shows a selection of wireframes where it can be observed how the guide could be displayed on the ODL Platform and the sought functionality as the citizen clicks through the steps.

Step	Suggested Tools/Templates

Step 0: Brief Creation	• Mind Map
	• Brainstorming Template
	• Need Definition Tool
	• Dataset Repository
	• Data Handling Tools:
	  • Search Dataset
	  • Upload Dataset
	  • Create Dataset
	  • Check Dataset
	• Data Visualization Tools (map and charts)
	• Data Scraping Tools
	• Brief Template

Step 1: Brainstorming	• Brainstorming Template • Dataset Repository • Search Dataset • Data Visualization Tools (map and charts)
Step 2: Open Data Facilitation	• Open Data Introduction • Inspiration Cards • Dataset Repository • Data Handling Tools (the same as in Step 0) • Data Visualization Tools (map and charts) • Data Scraping Tools
Step 3: Concept Development	• Concept Storyboard Template • Data Validation Tool • Dataset Repository • Data Visualization Tools (map and charts) • Data Scraping Tools • Data Handling Tools (the same as in Step 0)

Table 4.

Step	Suggested Tools/Templates
Step 3: Concept Development	• Refine Concept Template • Persona Template • Scenario Tool • Customer Journey Canvas • Stakeholder Map
Step 4: Prototype Building	App Construction Tools • Digital Mock-up Tools • Programming Tools • App Builders • Learning Tools • APIs
Step 5: Pitching Session	• Pitching Tool
Step 6: List the Service	• A button on the ODL Platform to list the service
Step 7: Testing	• Prototype Testing Guide: Usability
Step 8: Full Functionality	• App Construction Tools (the same as in Step 4)
Step 9: Business Model Creation	• Business Model Canvas
Step 10: Other Activities (optional)	• Depends on the activity

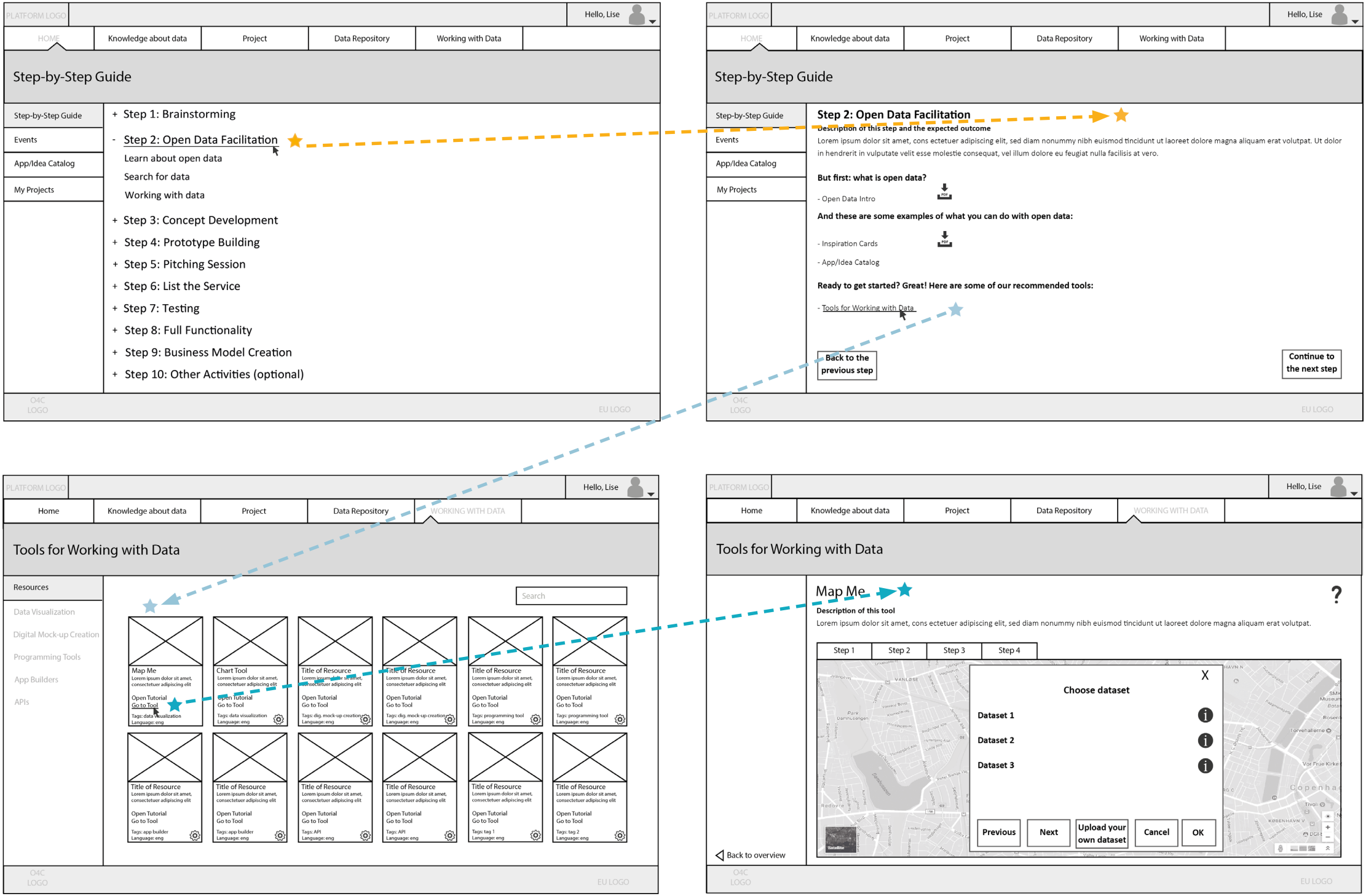

PLATFORM LOGO
Hello, Lise
HOME
Knowledge about data
Project
Data Repository
Working with Data
Step-by-Step Guide
Step-by-Step Guide
Events
App/Idea Catalog
My Projects
+ Step 1: Brainstorming
- Step 2: Open Data Facilitation
Learn about open data
Search for data
Working with data
+ Step 3: Concept Development
+ Step 4: Prototype Building
+ Step 5: Pitching Session
+ Step 6: List the Service
+ Step 7: Testing
+ Step 8: Full Functionality
+ Step 9: Business Model Creation
+ Step 10: Other Activities (optional)
O4C LOGO
EU LOGO
Step 2: Open Data Facilitation
Description of this step and the expected outcome
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut dolor in hendrerit in vulputate velit esse molestie consequat, vel illum dolore eu feugiat nulla facilisis at vero.
But first: what is open data?
- Open Data Intro
And these are some examples of what you can do with open data:
- Inspiration Cards
- App/Idea Catalog
Ready to get started? Great! Here are some of our recommended tools:
- Tools for Working with Data
Back to the previous step
Continue to the next step
Home
WORKING WITH DATA
Tools for Working with Data
Resources
Data Visualization
Digital Mock-up Creation
Programming Tools
App Builders
APIs
Search
Map Me
Chart Tool
Title of Resource
Open Tutorial
Go to Tool
Map Me
Description of this tool
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.
Step 1
Step 2
Step 3
Step 4
Choose dataset
Dataset 1
Dataset 2
Dataset 3
Previous
Next
Upload your own dataset
Cancel
OK
Back to overview

Fig. 8.

Blueprint

Stickdorn & Schneider define the service blueprint as “a way to specify and detail each individual aspect of a service”. It is a visual schematic that shows the perspectives of the user, the service provider and other actors involved, as well as the touchpoints and the processes needed to provide the service (Stickdorn & Schneider, 2015, pp. 204-207).

In the context of the proposed solution, one key moment in the Proposed Process is the Open Data Facilitation Session. The example shown is an external data expert holding a 3-hour session where the participants used their initial ideas to learn how to use the tools, thus using data as a filter to choose which of the ideas was more viable for them to realize into a service concept.

The blueprint complements the proposed process in that it shows which actions are necessary to enable the interactions between the co-design participants, the ODL Platform, the CPH Pilot[4] and all other actors and/or resources involved.

4 ODL CPH stands for Open Data Lab Copenhagen.

User flow

Evidence

HACKATHON

INTRODUCTION TO THE ODL PLATFORM (~ 45 mins)	INTRODUCTION TO OPEN DATA (~ 30 mins)	EXAMPLES OF OPEN DATA-BASED SERVICES (< 15 mins)
Platform introduced	Open Data Introducion	Inspiration Cards

Front stage

Backstage

User's actions

Get familiar with the tools in the Platform

Click on "Learn about open data"; listen to in-person explanation

Read some Inspiration Cards

Line of interaction/visibility

CPH Pilot/ODL CPH

Present the Platform, the Step-by-Step guide and its resources

Present the Inspiration Cards

External stakehol-ders

Data experts: introduce open data

ODL Platform

Load info and tools relevant to Step 2 of the Step-by-Step Guide

Load the info related to the Open Data Introduction

Load the Inspiration Cards

Line of internal interaction

Support Systems: Internal DB

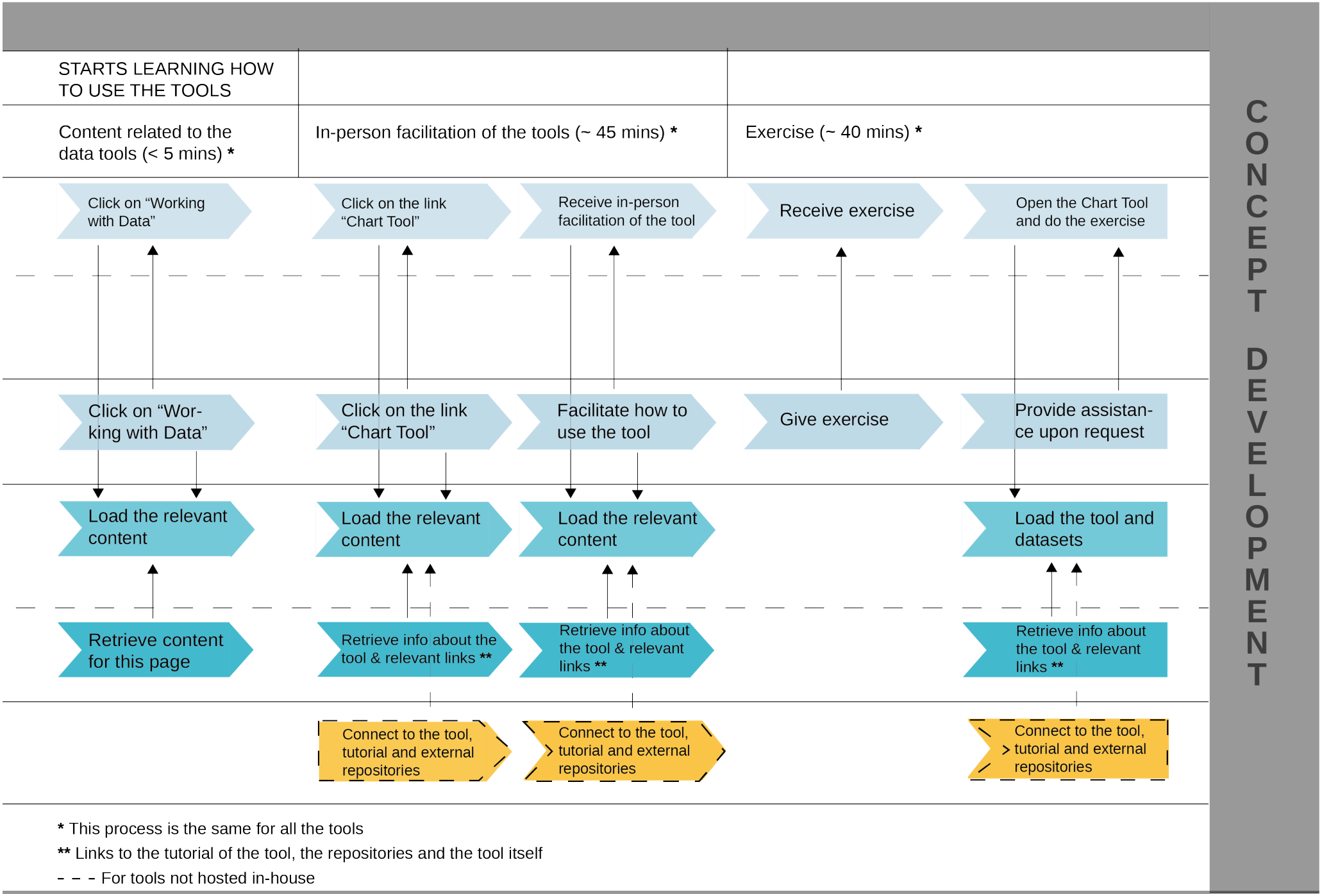
Retrieve content, links to tools, repositories, etc.

Retrieve content related to the Open Data Introduction

Retrieve Inspiration Cards

Support Systems: External Resources

Support Systems: Other



***** This process is the same for all the tools

****** Links to the tutorial of the tool, the repositories and the tool itself

\- - - For tools not hosted in-house

Independent Context

Proposed Process

This process (Fig. 9) has been designed thinking of those citizens who wish to undertake an independent process of learning and service creation. The process is meant to have a certain reciprocity with the co-design context process where relevant, in which the ODL Platform acts as the facilitator of knowledge and provider of the necessary resources for the citizen to achieve comparable results as if they participated in a co-design event.

This context is characterized for having an unlimited timeline, contrary to the co-design event, which usually lasts between 48 and 72 hours.

As with its counterpart at the co-design process, the Open Data Self-Study is a critical part of this process. It is recommended to have instructive videos that, together with small practical exercises, the citizen can use to learn how a good dataset looks like, how to visualize a dataset on a map or a chart, etc. Thus, by having these videos the in-person facilitation that occurs in the co-design event would be reciprocated, and the citizen could watch them whenever such a need arises.

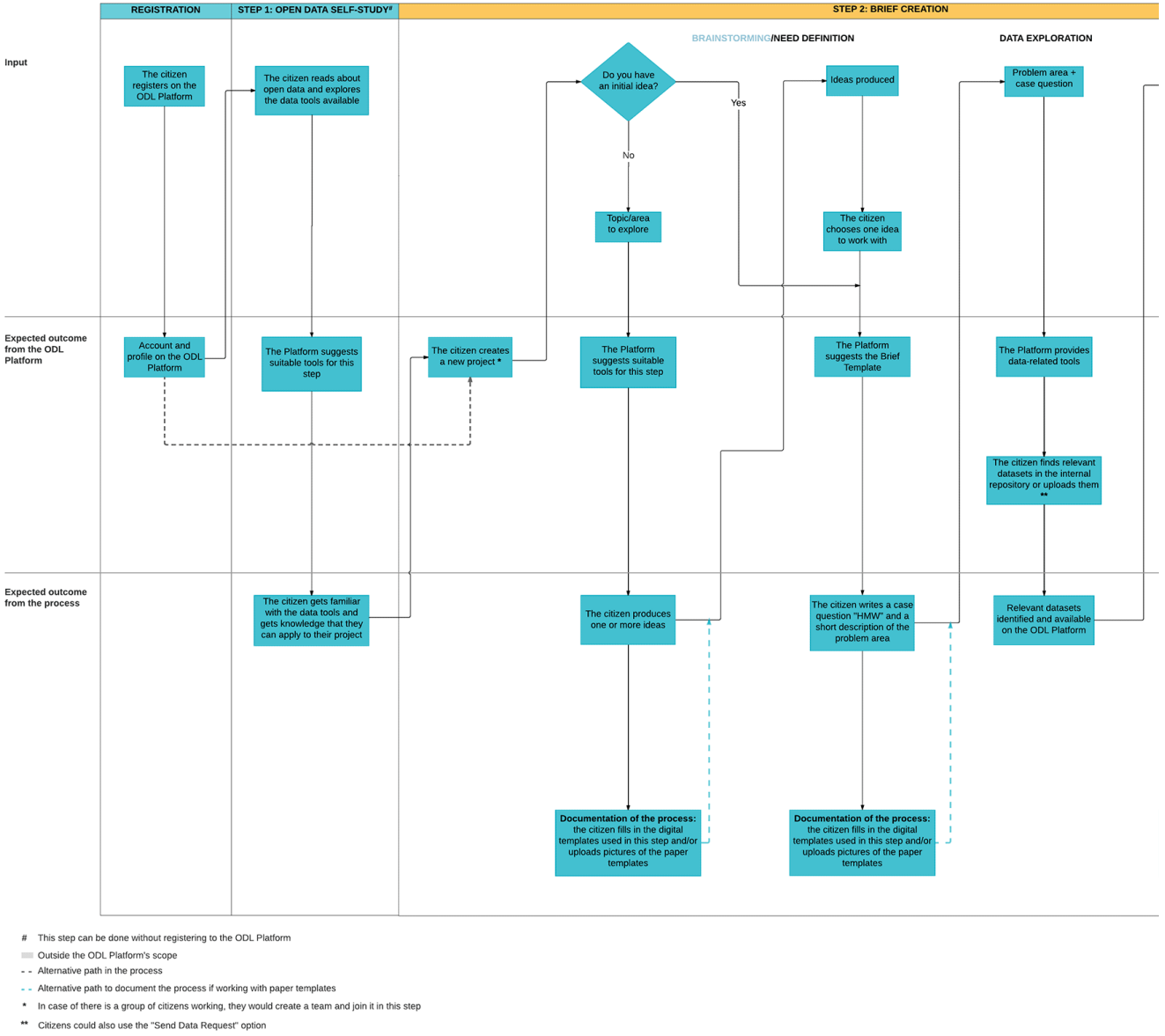
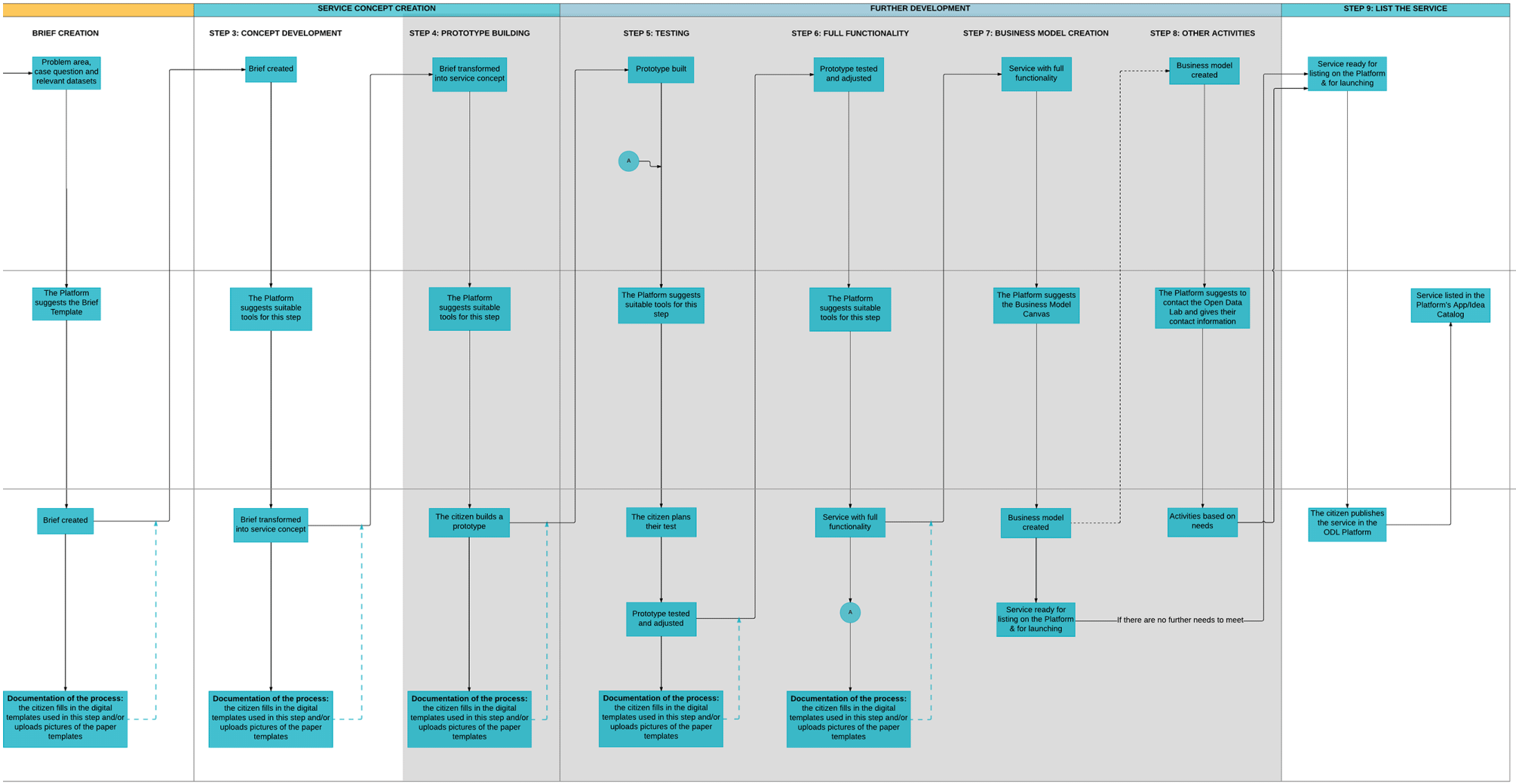


Fig. 9.



\# This step can be done without registering to the ODL Platform

Outside the ODL Platform's scope

\- - Alternative path in the process

\- - Alternative path to document the process if working with paper templates

* In case of there is a group of citizens working, they would create a team and join it in this step

[1]* Citizens could also use the "Send Data Request" option

Step-by-Step Guide

The step-by-step guide is the way in which the proposed process will be visualized to the citizen. In this context it is also intended to serve as an aid to the facilitators and organizer team. This guide is designed to have 9 steps, which correspond to the steps shown in the proposed process. With each step the guide will provide the necessary tools to accomplish the expected outcomes and point to where they are located on the ODL Platform (Table 5). This guidance is expected to be particularly useful in this context, as the Platform will attempt to simulate the facilitation that would take place at a co-design event.

As with the co-design context, the guide, while structured, is flexible enough to allow the citizen to decide whether they wish to use all the tools or only those they consider relevant for their solution. In addition, they can skip a step (particularly one of the later ones) should they not consider it pertinent to what they wish to accomplish.

To read more about the tools, please refer to the section “Proposed Toolbox”.

Fig. 10 shows a selection of wireframes where it can be observed how the guide could be displayed on the ODL Platform and the sought functionality as the citizen clicks through the steps.

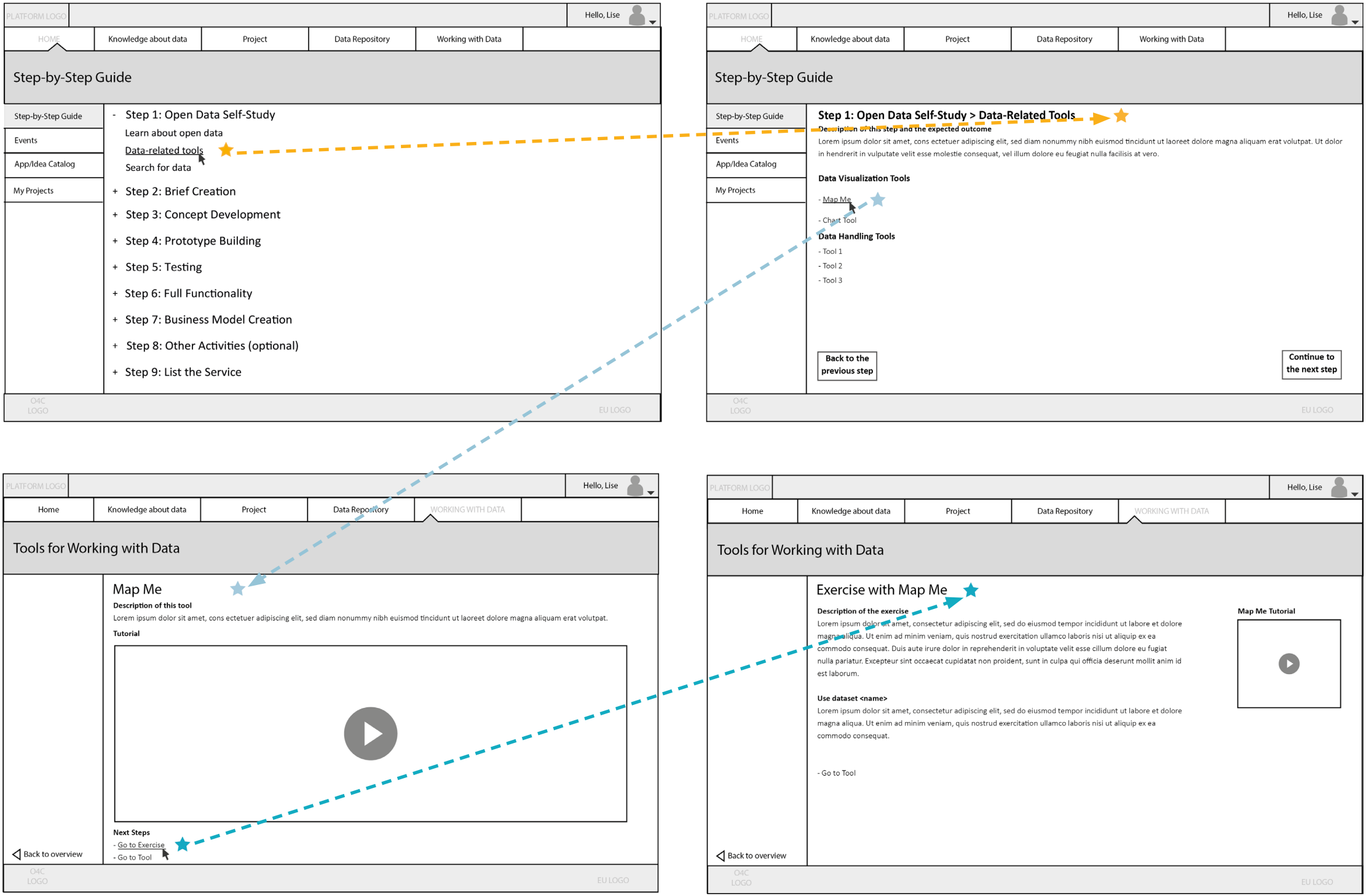
Step	Suggested Tools/Templates

Step 1: Open Data Self-Study	• Open Data Introduction
	• Inspiration Cards
	• Dataset Repository
	• Data Handling Tools:
	  • Search Dataset
	  • Upload Dataset
	  • Create Dataset
	  • Check Dataset
	• Data Visualization Tools (map and charts)
	• Data Scraping Tools
	• Instructive videos about how to use the data-related tools
	• Exercises with small challenges where citizens put in practice what they learned

Step 2: Brief Creation	• Mind Map • Brainstorming Template • Need Definition Tool • Dataset Repository • Data Handling Tools (the same as in Step 1) • Data Visualization Tools (map and charts) • Data Scraping Tools • Brief Template
Step 3: Concept Development	• Concept Storyboard Template • Data Validation Tool • Refine Concept Template • Persona Template • Scenario Tool • Customer Journey Canvas • Stakeholder Map

Table 5.

Step	Suggested Tools/Templates
Step 4: Prototype Building	App Construction Tools • Digital Mock-up Tools • Programming Tools • App Builders • Learning Tools • APIs
Step 5: Testing	• Prototype Testing Guide: Usability
Step 6: Full Functionality	• App Construction Tools (the same as in Step 4)
Step 7: Business Model Creation	• Business Model Canvas
Step 8: Other Activities (optional)	• Depends on the activity
Step 9: List the Service	• A button on the ODL Platform to list the service


PLATFORM LOGO
Hello, Lise
HOME
Knowledge about data
Project
Data Repository
Working with Data
Step-by-Step Guide
Step-by-Step Guide
Events
App/Idea Catalog
My Projects
- Step 1: Open Data Self-Study
Learn about open data
Data-related tools
Search for data
+ Step 2: Brief Creation
+ Step 3: Concept Development
+ Step 4: Prototype Building
+ Step 5: Testing
+ Step 6: Full Functionality
+ Step 7: Business Model Creation
+ Step 8: Other Activities (optional)
+ Step 9: List the Service
O4C LOGO
EU LOGO
Step 1: Open Data Self-Study > Data-Related Tools
Description of this step and the expected outcome
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Data Visualization Tools
- Map Me
- Chart Tool
Data Handling Tools
- Tool 1
- Tool 2
- Tool 3
Back to the previous step
Continue to the next step
Home
WORKING WITH DATA
Tools for Working with Data
Map Me
Description of this tool
Lorem ipsum dolor sit amet, cons ectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.
Tutorial
Next Steps
- Go to Exercise
- Go to Tool
Back to overview
Exercise with Map Me
Description of the exercise
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Use dataset <name>
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
- Go to Tool
Map Me Tutorial

Fig. 10.

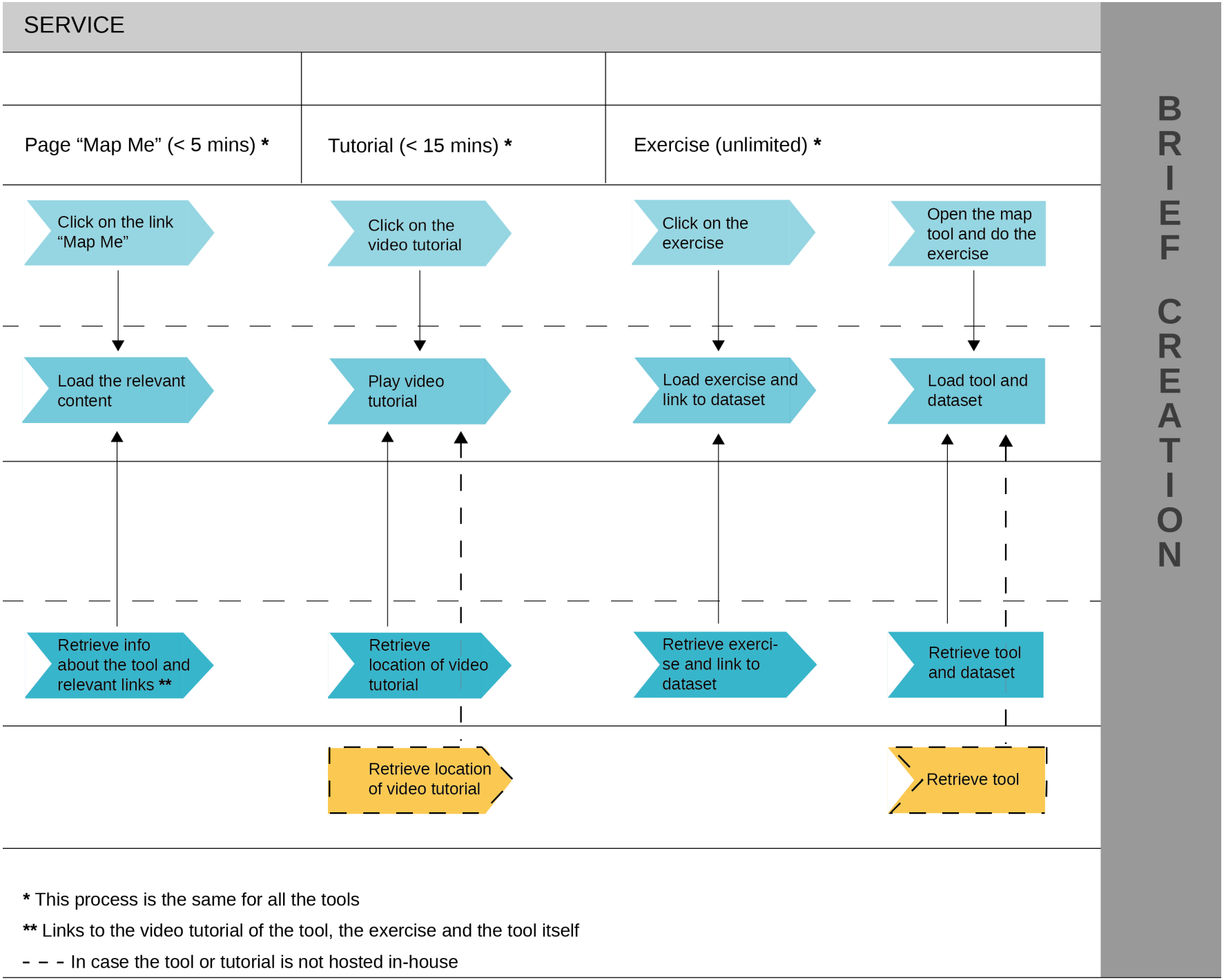
Blueprint

As with the co-design context process, a blueprint that focuses on a key aspect of the independent context process was made. The blueprints complement the proposed process in that it shows which actions are necessary to enable the interactions between the citizen, the ODL Platform, the CPH Pilot[5] and all other actors and/or resources involved.

The Open Data Self-Study is the first step in the process and the one where the citizen will get the knowledge they need to apply when creating their services. The example used in this blueprint is partly portrayed in the wireframe sequence shown in the previous page.

5 ODL CPH stands for Open Data Lab Copenhagen.

		SERVICE		
	User flow	READS ABOUT OPEN DATA (< 30 mins)	SEES EXAMPLES OF OPEN DATA-BASED SERVICES (< 15 mins)	STARTS LEARNING HOW TO USE THE TOOLS
	Evidence	Open Data Introduction	Inspiration Cards	Content related to the data tools (< 5 mins)
Front stage	User's actions	Click on "Learn about open data"	Read some Inspiration Cards	Click on "Data-related tools"
	Line of interaction			
	ODL Platform	Load the info related to the Open Data Introduction	Load the Inspiration Cards	Load the relevant content
	Line of visibility			
Backstage	CPH Pilot/ODL CPH			
	Line of internal interaction			
	Support Systems: Internal DB	Retrieve content related to the Open Data Introduction	Retrieve Inspiration Cards	Retrieve content for this page
	Support Systems: External Resources			
	Support Systems: Other			



***** This process is the same for all the tools

****** Links to the video tutorial of the tool, the exercise and the tool itself

- – - In case the tool or tutorial is not hosted in-house

Proposed Toolbox

The proposed toolbox includes tools (Table 6) from the Hackathon Starter Kit from 2016, and tools and templates that have been adapted, created or chosen for this project, on the premise that this combination is considered suitable to transform the inputs into the expected outcomes.

Tool	Pre-Hack		Hackathon	Post-Hack	PDF or Digital
	Need Definition	Data Exploration			
Mind Map	✓				PDF
Need Definition Tool *	✓				Both
Dataset Repository !		✓	✓		Digital
Data Visualization Tools (maps and charts) !		✓	✓		Digital
Data Scraping Tools		✓	✓		Digital
Data Handling Tools		✓	✓		Digital
Brief Template #	✓	✓			Both
Open Data Introduction and Inspiration Cards !			✓		Both
Brainstorming Template #	✓		✓		Both
Concept Storyboard Template #			✓		Both

Tool	Pre-Hack		Hackathon	Post-Hack	PDF or Digital
	Need Definition	Data Exploration			
Refine Concept Template #			✓		Both
Data Validation Tool *			✓		Both
Persona Template #			✓		Both
Scenario Tool *			✓		PDF
Customer Journey Canvas			✓		Both
Stakeholder Map			✓		Both
App Construction Tools + !			✓	✓	Digital
Pitching Tool *			✓		Both
Prototype Testing Guide: Usability #				✓	Both
Business Model Canvas				✓	Both

***** Tools from the Hackathon Starter Kit (2016)
! Tools already available on the ODL Platform
Tools that were created or adapted
+ Links to external resources in the Build App section

Tools Specifically Adapted or Created

BRIEF TEMPLATE

Problem Area
Short description of the situation in which the problem occurs.

Case Question
The issue within the problem area that you wish to address.

How might we ...?

Suggested Datasets
Which kind of data is relevant to address the case question?

PERSONA TEMPLATE

"A quotation that captures this persona's personality"

Age:
Work:
Family:
Location:

Bio

Goals

-
-
-

Personality

Introvert — Extrovert

Thinking — Feeling

Sensing — Intuition

Judging — Perceiving

Frustrations

-
-
-

Trait 1 *Trait 2* *Trait 3* *Trait 4*

This template is adapted from the User Persona Template by Xtensio. Attribution: https://xtensio.com/

BRAINSTORMING TEMPLATE

Situation:

When _____

Motivation:

I want to _____

Expected outcome:

so that I can _____

Situation:

When _____

Motivation:

I want to _____

Expected outcome:

so that I can _____

CONCEPT STORYBOARD TEMPLATE

Situation:	**Key interaction:**	**Dataset(s) needed:**	**Data sources:** *Where would you find this data? Who owns it?*	**Desired outcome:**

REFINE CONCEPT TEMPLATE

When is it valuable?
(Scenario, timeframe)

Who is it for?
(Main user, stakeholder, customer)

Why is it valuable?
(Main impact, improvements)

Think-Aloud Test

A Think-Aloud Test is a task-based test to test the functionality of a website or an app, where the participant expresses verbally their thoughts, feelings and experiences (positive and negative) while they carry out tasks. For example: you wish to test a recycling app you just made.

To prepare such a test you:

- Create a list of 5 to 7 tasks which are usually the key interactions or features of particular interest for the service. For the above example the tasks could could be: find the nearest glass container to your location, find battery containers at a particular address, etc.
- To provide a context for the tasks, they could be written as task scenarios and at the test you could phrase them as "Imagine that …" and the task scenario. For example:
- **Task scenario:** you have a lot of cardboard to recycle but you do not know where the nearest recycling container to your location is
- **Task at the test:** "Imagine that you have a lot of cardboard to recycle, but you do not know where the nearest container is. How would you find it on this app?"
- Take the test in order to familiarize with it and to log the time that it took to achieve each task. These results will be used for comparing those obtained from the test participants

Planning the Test

Before the Test

- Set the goal(s) of the test: what do you want to test? Make sure that the goals are realistic and measurable. Going back to the example, a goal could be that the participants find the information about the nearest container in less than 60 seconds
- As a minimum there should be one facilitator to moderate the test and talk to the participants, and one person to document and observe
- Recruit the participants, preferably from the service's target group. Five to six people per testing round is enough
- Choose the most suitable equipment for the test that will be performed: stationary computer, laptop, tablet or cell phone according to the prototype and what will be tested. The device(s) should have the prototype ready to be tested
- Consider how you wish to record the test: video, pictures, audio, screen capture or a combination of tools
- Agree on any possible compensations for the participants, if applicable
- Plan on refreshments for the participants and the testing staff

One tool designed to simplify the preparation of the test is the Usability Test Plan Template.

When the Test Participants Arrive

- Inform about the practicalities of the test:
  - The objective of the test
  - How long the test is expected to take
  - How the test will be and that you are testing a prototype and not them, thus there are no wrong answers
  - How the test will be recorded
  - Compensations, if that is the case
- Set up the test prior to receiving the next participant

After the Test

- Compare the results from the test participants with the results from your test. Which main insights have you learned from the test? Did you reach your goal(s)?
- Adjust the prototype accordingly and decide if further testing is needed

USABILITY TEST PLAN TEMPLATE

Author

Final Date For Planning The Test

Service/App Under Test
What is being tested?

Test Goals
What are the goals of this test? What specific questions will be answered? What hypotheses will be tested?

Participants
How many participants will be recruited? What are their key characteristics?

Test tasks
What are the test tasks?

Responsibilities
Who is involved in the test and what are their responsibilities?

Reason(s) For The Test
Why are we doing this test?

Equipment
What equipment is required? How will you record data?

Location & Dates
Where and when will the test take place? When and how will the results be shared with the rest of the team?

Procedure
What are the main steps in the test procedure?

TEAM FORMATION TIPS

Teamwork and collaboration are important for developing good service concepts. In a co-design environment, the teams should include various areas of expertise and skillsets that complement each other, thus bringing as many different points of view to the case question as possible.

The starting point of the team formation process is to take the participants list and **divide the participants by backgrounds or skills**. Then, the basic requirements that the teams should fulfill are:

- Size: 4 to 5 people
- Different backgrounds and skills, and whenever possible, diversity in age and gender

There are 2 ways to form the teams. One way is that you, as part of the organizers, make them based on the aforementioned requirements. On the event day, the participants will meet their teams. To do so:

- Give each team a name or a number and print the team's name/number together with the participant's name in a name tag
- Ask the participants to "go find their teammates"

The other way is to facilitate a game plan to allow the participants build their own teams:

- Attach a sticker in this shape, animal or color to the name tags
- Inform the participants of the characteristics of the teams (size and diversity of backgrounds)
- Ask the participants find teammates with name tags of different shapes, animals or colors

This activity should take 10 to 15 minutes.

It is likely that the team members do not know each other. The following questions could ease that first interaction and help them get started working together and with a good group dynamic:

- What is your name?
- What is your background?
- What was the most interesting part of the case question for you?
- If the team does not have a name, their first task could be to make one up

This activity should not take more than 15 to 20 minutes, depending on the size of the group.

Additional Features for the ODL Platform

Inspiration

1. App/Idea Catalog with a search function and listing all available projects categorized by type of app/idea/service

Project Creation

1. Create Project
2. Upload Files to Project
3. Add Team to Project

Team Management

1. Create Team
2. Join Team
3. Add Team Member

Other

1. Tutorials for the service creation-related tools, in video. These and the instructive videos should be available on the individual tool or they can build up a FAQ/Help section
2. A forum where citizens can ask for help with specific parts of their projects or make calls for contributions that could result in an informal co-design event

Tools for Facilitators

The target group “facilitators” felt more like a profile or a job description than a persona, thus a profile with minimum requirements was created.

The following tools were included with the objective to make the role of the facilitators easier:

- **Sign-up to co-design events:** a form made by integrating the Eventbrite API to the ODL Platform
- Team Formation Tips Guide
- Team Management, as specified on this page
- 2-Minute Feedback Template, that the judges can use to evaluate the pitching sessions. This tool was an addition to the Hackathon Starter Kit on the first hackathon event

FACILITATOR PROFILE

As a facilitator it is your task to assist the teams in using the ODL Platform if they get stuck during the hackathon. To fulfill that task, you should:

- Have good command of how the ODL Platform works, how to navigate through it to find the tools and templates
- Understand how the templates and tools the Platform is equipped with work, so as to be able to provide guidance to the teams if need be
- Actively engage with the participant teams

Prior to the hackathon, it is recommended that you have some data skills, in particular regarding making sure that the datasets are operable and in the correct format, how to upload datasets and make them available on the Platform.

Value Proposition of the ODL Platform

The Oxford Dictionary of Marketing defines value proposition as *"the company's core promise of benefits to clients and prospective clients"* (Doyle, 2011). It gives the customer base of the company reason(s) to choose their offerings over other similar existing solutions. With a clear value proposition a company can differentiate themselves from the competitors and position themselves in the minds of the customer base.

After having examined the ODL Platform's current features, the proposed solution and the potential it can have to reach the goal set by O4C, and having assessed the competitors, a value proposition has been created as follows.

"The ODL Platform helps citizens with little to no data skills who want to learn about open data by providing step-by-step guidance and relevant resources, all accessible in one site."

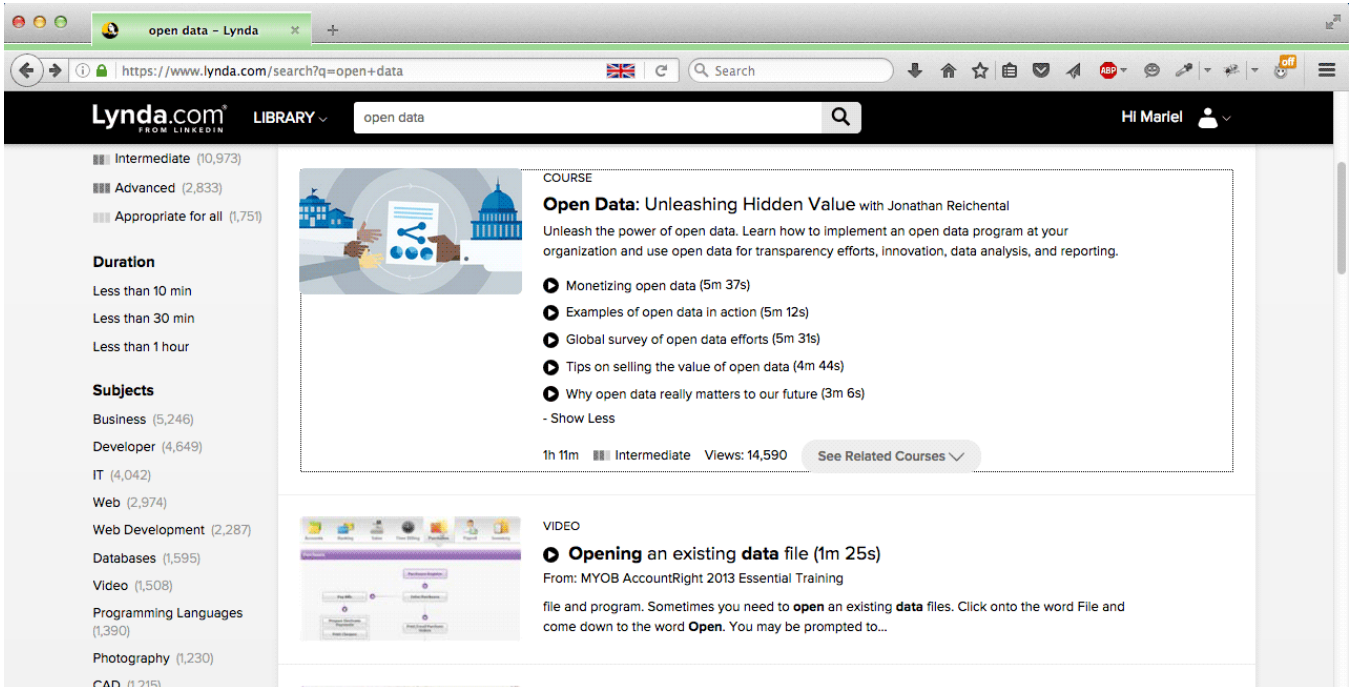
Further Development

The following are recommendations to take into consideration, so as to keep the ODL Platform current and relevant for the target group.

- To review the tools, templates and additional features over time and include new tools and/or templates or improved versions of the ones already present where it is appropriate to do so
- To create more Prototype Testing Guides that show other ways in which citizens can test prototypes
- To add the data tools that the partners at TU Delft (RTM Pilot) were working on at the time of the writing of this thesis
- To evaluate whether the new or improved tools added to the Platform are useful to the target audience
- To further develop the independent context and to test it with the target audience
- To undertake research to determine how the solution can be adapted to the other pilots' needs

The suggestions below were given at the test rounds.

- To implement a "library project video tutorial" with a specific project to make, that will give citizens (especially those without an initial idea) extra guidance through the process of creating an app using the datasets and tools available on



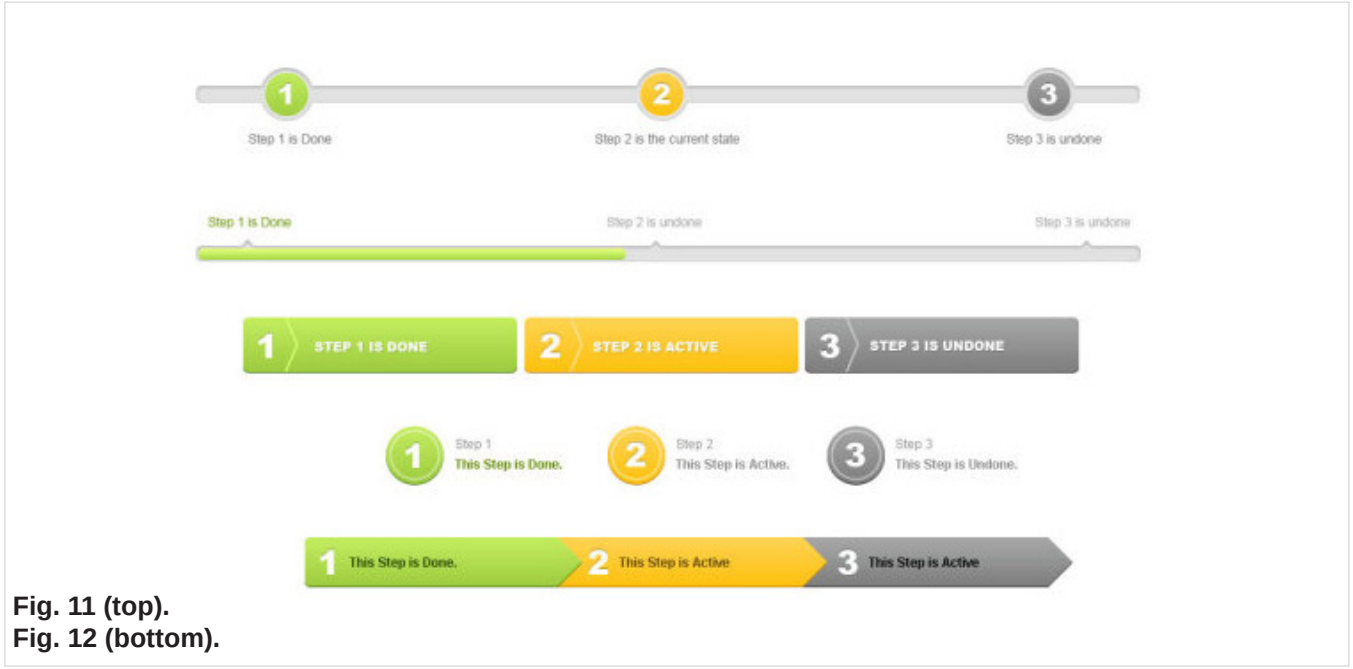


Fig. 11 (top).
Fig. 12 (bottom).

the ODL Platform.

The tutorial could resemble the style of the courses available on the learning platform Lynda.com (Fig. 11). In this case each step has its own video; or the steps could be divided into sub-steps, each with its own video. Furthermore, the citizen could use this as a reference that they could go back to, and it could be a way for them to get to know the Platform.

- TS1 and TS2 both agree that the Platform should be a mean to connect people with ideas with people who have technical, design or business skills to execute the ideas - which could be beneficial for those who do not wish to go through the whole process but still want to take advantage of learning and realize their ideas in collaboration with others
- To expand the usage of the Platform to uses beyond making apps or creating services. In addition to allowing for collaborations among citizens as explained above, another possible angle could be the citizen who wants to explore data with the intention to find interesting things and/or to create a data visualization on a specific topic for their blog or for a report. This, as well as discovering other scenarios, could be investigated with user research
- The Persona Template and the Scenario Tool could be simplified more and have only the minimum necessary
- To list the contact information of the external resources in case citizens need help building the prototypes
- The App/Idea Catalog should show ideas that are similar or related, based on the tags people use to describe their projects. That way, a sort of connection between the projects' creators could be established, that might lead to collaborations
- To incorporate a project management tool or a way to see what citizens have made and what other activities are left to do to accomplish the steps. This could be accomplished with a progress bar. Some examples of how this bar could look like are shown in Fig. 12

Organizations and communities to reach out to after O4C ends

The ODL Platform has the potential to become a powerful tool for learning about open data. As such, it should continue growing:

- In the technical aspect, as it has been suggested earlier in this report, and
- By expanding the CPH Pilot's network with possible stakeholders that can help to carry on with the work that will be done by the time O4C comes to an end

It is thus advised to form collaborations with organizations, such as Open Data DK, Open Knowledge DK, Virk Data, innovation centers, relevant startups, municipalities with focus on smart cities, and events such as TechFestival[6]. Virk Data[7] is a registry managed by the Danish Business Authority; they feature an Open Data School[8], which as of April 2017 was still under development.

In addition, the CPH Pilot could consider reaching out to programming and/or data-related communities. Some examples are, but are not limited to:

- Codher: http://www.codher.com/
- Le Wagon: https://www.meetup.com/Le-Wagon-Copenhagen-Coding-Station/
- GoShareData: https://www.meetup.com/gosharedata/
- cOpenData: https://www.meetup.com/cOpenData/
- CPH Data Drinks: https://www.meetup.com/CPH-Data-Drinks/

6 http://techfestival.co

7 https://data.virk.dk/

8 https://data.virk.dk/open-data-school

Conclusion

After having conducted all the steps in the research phase, a clear understanding of the ODL Platform and the context it lives in has been achieved. It has been learned that there is not one single cause as to why the Platform was underutilized during the first round of hackathons, but rather a combination of challenges in 4 aspects. Reaching that understanding has led to the development of a solution that answers the final problem statement.

The target group for which the solution was developed is citizens with little to no knowledge of data, irrespective of their technical or programming skills. They can use the Platform at a co-design event or independently.

The solution is a process with a flexible structure that turns the Platform into a facilitation tool, providing the target group with a Step-by-Step Guide to learn about open data and to transform an initial idea into a service with data as its core element. To fulfil that role, the Guide includes tools and templates that have a practical approach. Citizens and co-design event participants are encouraged to document their process as they go along, not only for them to remember how they made certain decisions, but because we are in a time where showing the “behind the scenes” is as important as showing the finished product or service.

Implementing the solution will accomplish 2 things. The first one is to differentiate the Platform from similar services. Citadel on the Move, the closest direct competitor, has as main objective to help users in making open data-based apps without any coding whatsoever. In addition, there is a number of indirect competitors with different offerings in their areas.

Websites such as Lynda.com and Coursera are not dedicated to teaching solely open data. There are other data platforms but they focus on being repositories. Virk Data’s initiative Open Data School is still under construction. Where the ODL Platform makes a difference is in combining all these aspects: the learning, the data repositories, the providing of resources to create apps, together with adding a streamlined process and guidance that give concrete outputs - all conveniently located in one place.

The second accomplishment is to reach the goal that O4C and the future Open Data Lab CPH set for themselves, namely to empower citizens to use open data in a meaningful manner. The gap between the possibilities of data and the citizens’ capability to unlock them will be reduced by means of a design process specifically created for this project.

The acquisition of skills in these areas will lead to empowerment. An empowered citizen is one with the ability to make better informed decisions that will lead to the improvement of their local communities and, at a larger scale, to the cities they live in. In turn, a welcome side effect will be the transformation from a passive role in the smart city movement to finding areas where they can contribute, thus making them more actively involved and wanting to be a bigger part of it.

"What we call the beginning is often the end. And to make an end is to make a beginning. The end is where we start from."

T. S. Eliot*

* http://www.columbia.edu/itc/history/winter/w3206/edit/tseliotlittlegidding.html

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Internal Documents

Extended Report: report that seeks to reflect upon various aspects of the hackathon process (pre-hack, hackathon and post-hack), with respect to challenges, dissemination activities, stakeholders reached out, approach to the hackathon, etc.

Participant Evaluations: document that the participants filled in to express how satisfied they were with the hackathon, what they gained from it and what could be improved.

Hackathon Crew Evaluations: document that the CPH Pilot filled in to reflect on what was learned and what could be improved after the hackathon was finished.

Picture Sources (Not Created by Me)

Fig. 1. http://open4citizens.eu/

Fig. 2. http://open4citizens.eu/consortium/

Fig. 8. Wireframes provided by Dataproces and adapted by me.
- Avatar from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Download icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Help icon (“?”) from http://www.freepik.com/free-vector/100-universal-icons_993473.htm (adapted by me)

Fig. 10. Wireframes provided by Dataproces and adapted by me.
- Avatar from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Download icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (adapted by me)
- Video icon from http://www.freepik.com/free-vector/useful-web-icons-collection_573292.htm (composite made by me)

Fig. 12. Image from http://freedesignfile.com/23559-website-progress-bar-psd-material/

Brief Template: Adaptation of the briefs observed at Open Tourism Days

Persona Template: Adaptation of the Persona template at http://xtensio.com/

Concept Storyboard Template: Adaptation of a template used at the Copenhagen Service Jam 2017 http://www.copenhagenservicejam.com/

Refine Concept Template: Adaptation of a template used at the Copenhagen Service Jam 2017 http://www.copenhagenservicejam.com/

Usability Test Plan Template: Adaptation of the Usability Test Plan Dashboard created by User Focus (Travis, 2013)

Team Formation Tips Guide: Graphic from http://www.freepik.com/free-vector/businesspeople-working-together_946832.htm (modified by me)


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Dataproces®

Proposed Processes

In A3 paper size for printing.

Proposed Process - Co-design Context

Mariel Backman | 20152043

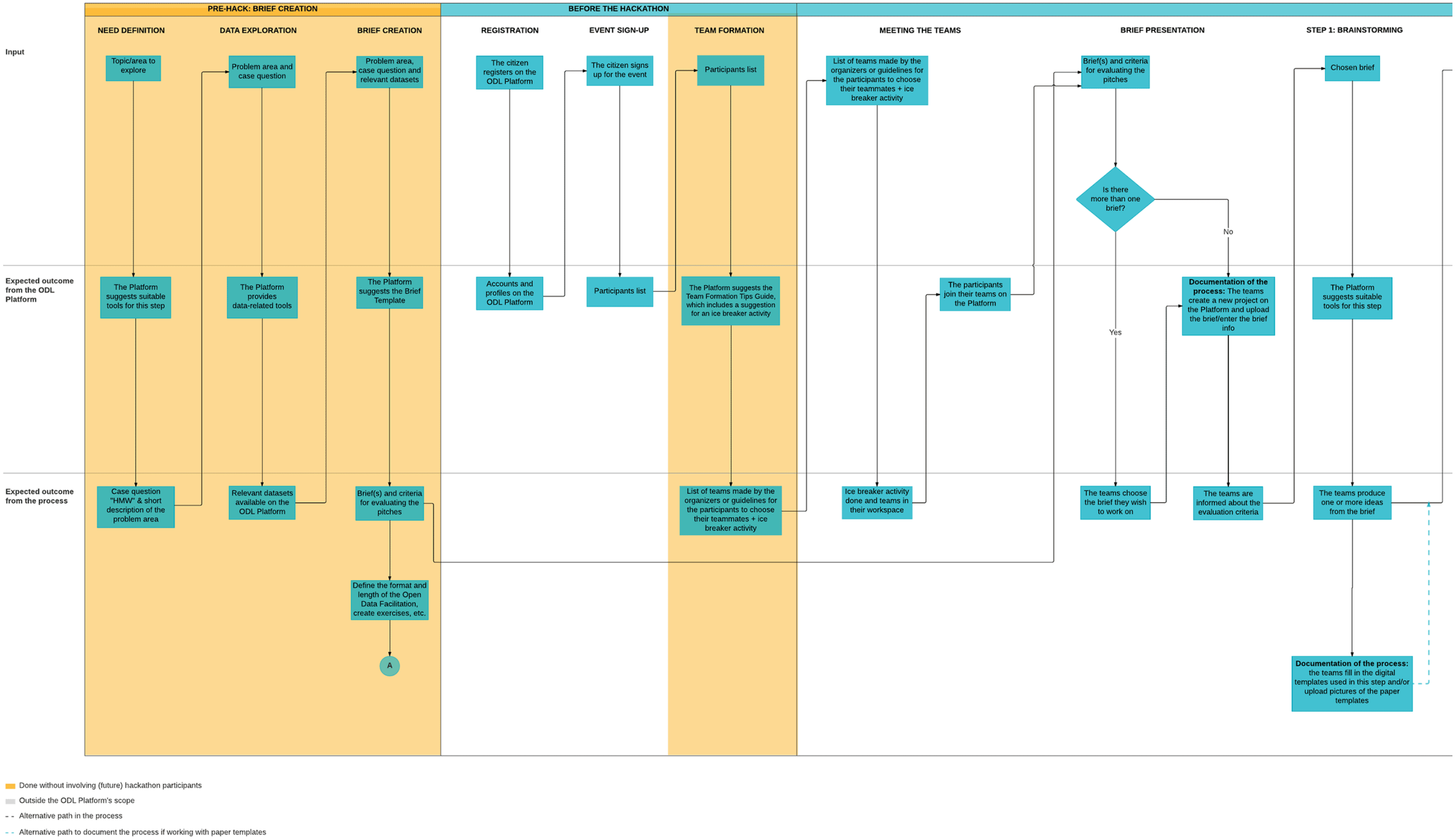
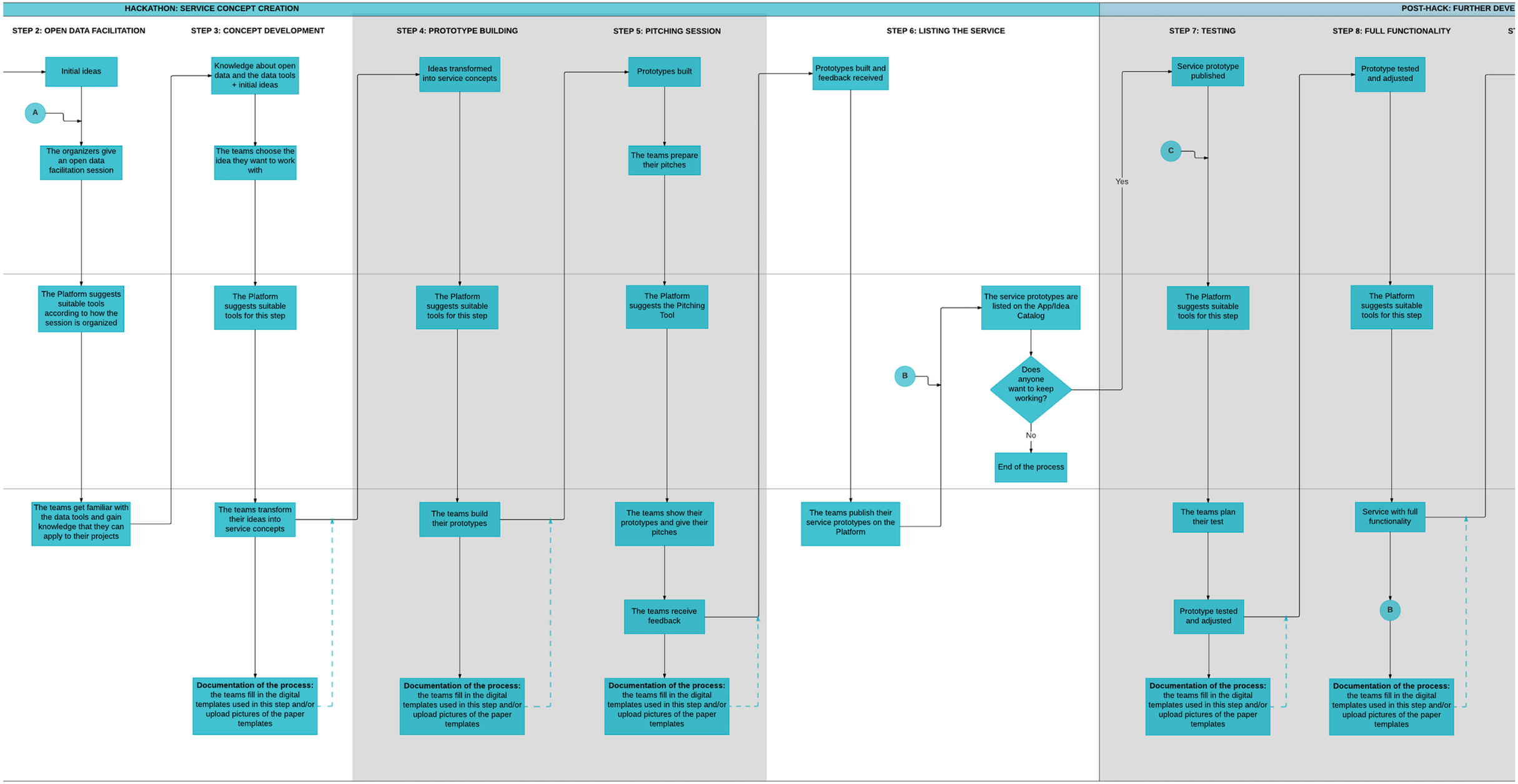


Fig. 14.

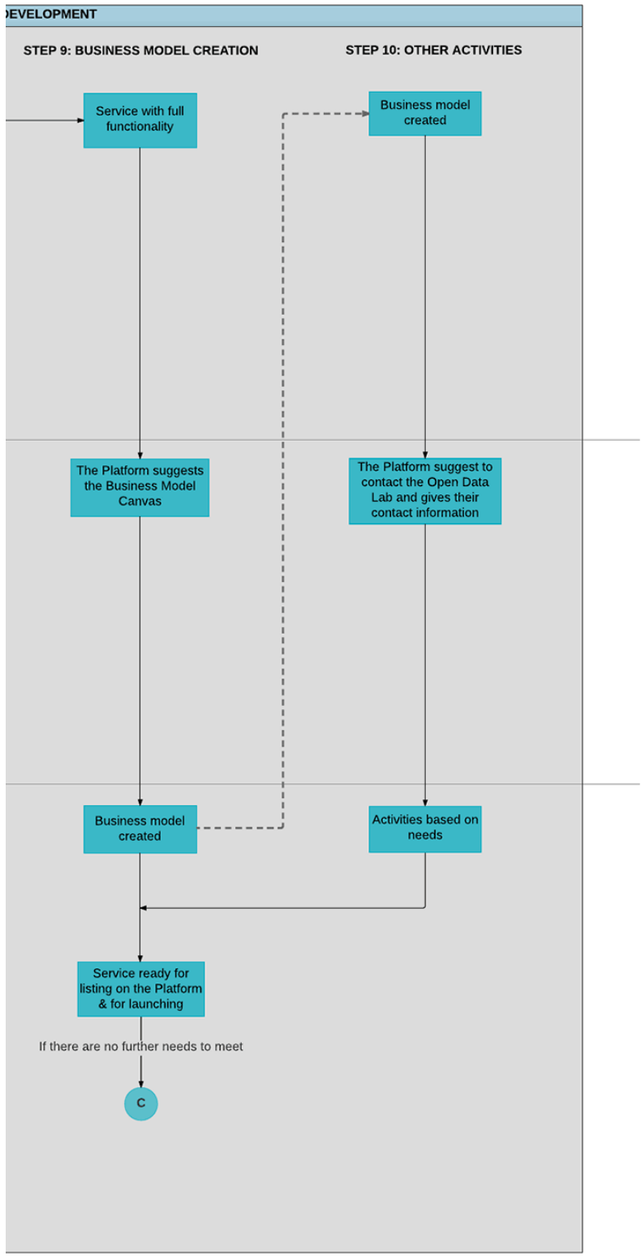


Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates



Done without involving (future) hackathon participants

Outside the ODL Platform's scope

Alternative path in the process

Alternative path to document the process if working with paper templates

Proposed Process - Independent Context

Mariel Backman | 20152043

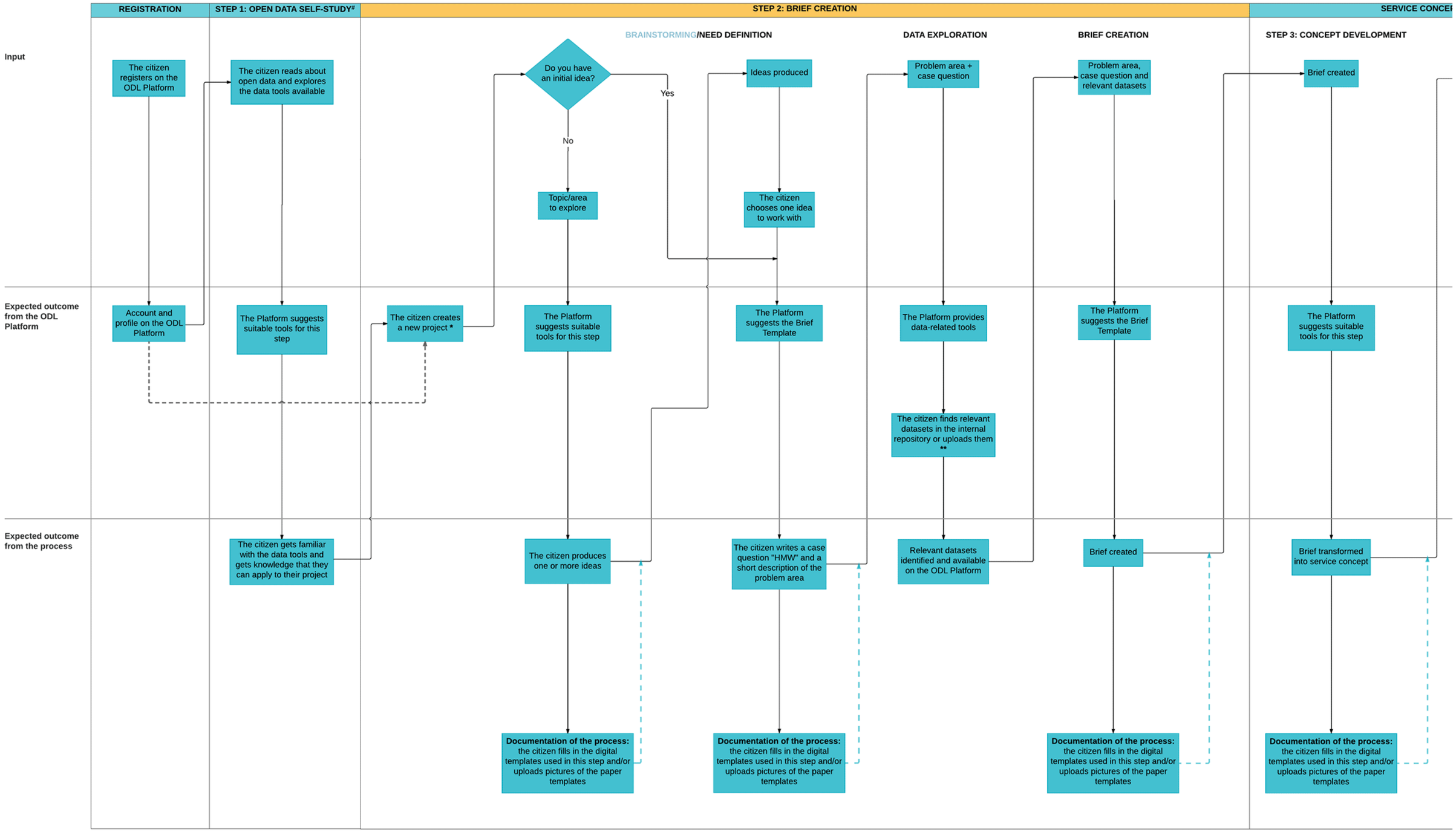
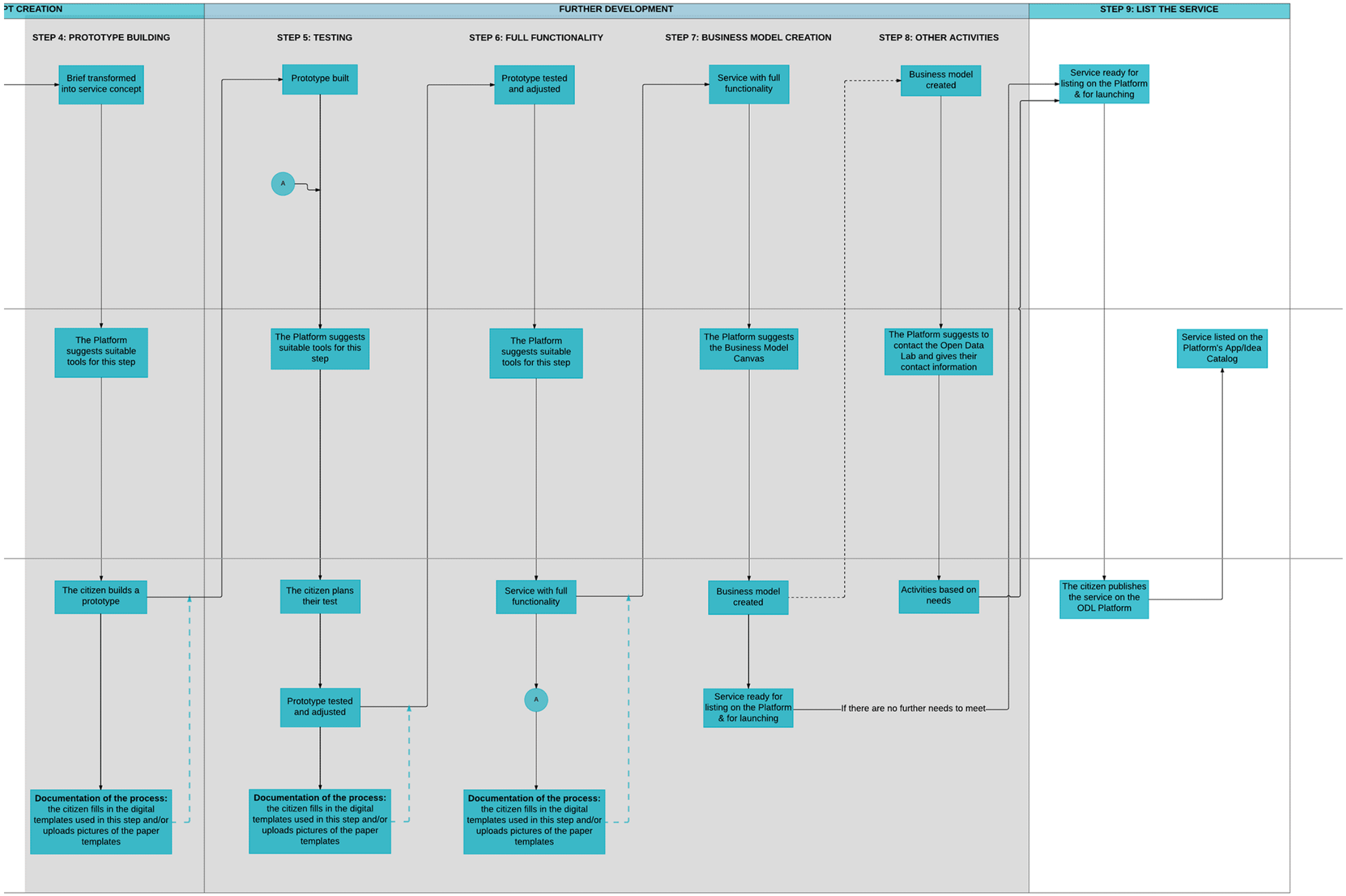


Fig. 16.



\# This step can be done without registering to the ODL Platform

Outside the ODL Platform's scope

\- - Alternative path in the process

\- - Alternative path to document the process if working with paper templates

* In case of there is a group of citizens working, they would create a team and join it in this step

** Citizens could also use the "Send Data Request" option